NARASARAOPETA
ENGINEERING COLLEGE
(AUTONOMOUS)

ACADEMIC CALENDAR

AY 2024-25

Narasaraopeta Engineering College (Autonomous)
Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

ACADEMIC CALENDAR
(B.Tech. 2024 Admitted Batch, Academic Year 2024-25)

B.Tech 2024 Batch 1st Year 1st Semester			
Description	**From Date**	**To Date**	**Duration**
Commencement of Class Work	29-07-2024		
Induction Programme (Zero Semester)	29-07-2024	17-08-2024	3 Weeks
1st Spell of Instructions	19-08-2024	12-10-2024	8 Weeks
I Assignment Test	16-09-2024	21-09-2024	
I Mid examinations	14-10-2024	19-10-2024	1 Week
2nd Spell of Instructions	21-10-2024	14-12-2024	8 Weeks
II Assignment Test	18-11-2024	23-11-2024	
II Mid examinations	16-12-2024	21-12-2024	1 Week
Preparation & Practicals	23-12-2024	28-12-2024	1Week
Semester End Examinations	30-12-2024	11-01-2025	2 Weeks
B.Tech 2024 Batch 1st Year 2nd Semester			
Commencement of Class Work	13-01-2025		
1st Spell of Instructions	13-01-2025	08-03-2025	8 Weeks
I Assignment Test	10-02-2025	15-02-2025	
I Mid examinations	10-03-2025	15-03-2025	1 Week
2nd Spell of Instructions	17-03-2025	10-05-2025	8 Weeks
II Assignment Test	14-04-2025	19-04-2025	
II Mid examinations	12-05-2025	17-05-2025	1 Week
Preparation & Practicals	19-05-2025	24-05-2025	1 Week
Semester End Examinations	26-05-2025	07-06-2025	2 Weeks
Commencement of 2nd Year 1st Sem Class Work	09-06-2025		

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NARASARAOPET - 522 601, Palnadu (Dist.), A.P

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Narasaraopeta Engineering College (Autonomous)
Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

ACADEMIC CALENDAR
(B.Tech. 2023 Admitted Batch, Academic Year 2024-25)

B.Tech 2023 Batch 2nd Year 1st Semester			
Description	**From Date**	**To Date**	**Duration**
Commencement of Class Work	19-08-2024		
1st Spell of Instructions	19-08-2024	12-10-2024	8 Weeks
I Assignment Test	16-09-2024	21-09-2024	
I Mid examinations	14-10-2024	19-10-2024	1 Week
2nd Spell of Instructions	21-10-2024	14-12-2024	8 Weeks
II Assignment Test	18-11-2024	23-11-2024	
II Mid examinations	16-12-2024	21-12-2024	1 Week
Preparation & Practicals	23-12-2024	28-12-2024	1Week
Semester End Examinations	30-12-2024	11-01-2025	2 Weeks
B.Tech 2023 Batch 2nd Year 2nd Semester			
Commencement of Class Work	13-01-2025		
1st Spell of Instructions	13-01-2025	08-03-2025	8 Week
1 Assignment Test	10-02-2025	15-02-2025	
I Mid examinations	10-03-2025	15-03-2025	1 Week
2nd Spell of Instructions	17-03-2025	10-05-2025	8 Weeks
II Assignment Test	14-04-2025	19-04-2025	
II Mid examinations	12-05-2025	17-05-2025	1 Week
Preparation & Practicals	19-05-2025	24-05-2025	1 Week
Semester End Examinations	26-05-2025	07-06-2025	2 Weeks
Commencement of 3rd Year 1st Sem Class Work	09-06-2025		

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Narasaraopeta Engineering College (Autonomous)
Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

ACADEMIC CALENDAR
(B.Tech. 2022 Admitted batch, Academic Year 2024-25)

2022 Batch 3rd Year 1st Semester			
Description	**From Date**	**To Date**	**Duration**
Commencement of Class Work	01-07-2024		
1st Spell of Instructions	01-07-2024	24-08-2024	8 Weeks
I Assignment Test	29-07-2024	03-08-2024	
I Mid examinations	26-08-2024	31-08-2024	1 Week
2nd Spell of Instructions	02-09-2024	26-10-2024	8 Weeks
II Assignment Test	30-09-2024	05-10-2024	
II Mid examinations	28-10-2024	02-11-2024	1 Week
Preparation & Practicals	04-11-2024	09-11-2024	1Week
Semester End Examinations	11-11-2024	23-11-2024	2 Weeks
2022 Batch 3rd Year 2nd Semester			
Description	**From Date**	**To Date**	**Duration**
Commencement of Class Work	25-11-2024		
1st Spell of Instructions	25-11-2024	18-01-2025	8 Weeks
I Assignment Test	23-12-2024	28-12-2024	
I Mid examinations	20-01-2025	25-01-2025	1 Week
2nd Spell of Instructions	27-01-2025	22-03-2025	8 Weeks
II Assignment Test	24-02-2025	01-03-2025	
II Mid examinations	24-03-2025	29-03-2025	1 Week
Preparation & Practicals	31-03-2025	05-04-2025	1Week
Semester End Examinations	07-04-2025	19-04-2025	2 Weeks

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

ACADEMIC CALENDAR
(B.Tech. 2021 Admitted Batch, Academic Year 2024-25)

2021 Batch 4th Year 1st Semester			
Description	**From Date**	**To Date**	**Duration**
Commencement of Class Work	13-06-2024		8 Weeks
1st Spell of Instructions	13-06-2024	10-08-2024	
Assignment Test-I	15-07-2024	20-07-2024	
I Mid examinations	12-08-2024	17-08-2024	1 Week
2nd Spell of Instructions	19-08-2024	12-10-2024	8 Weeks
Assignment Test-II	16-09-2024	21-09-2024	
II Mid examinations	14-10-2024	19-10-2024	1 Week
Preparation & Practicals	21-10-2024	26-10-2024	1Week
Semester End Examinations	28-10-2024	09-11-2024	2 Weeks
2021 Batch 4th Year 2nd Semester			
Description	**From Date**	**To Date**	**Duration**
Commencement of Class Work	11-11-2024		
Abstract Submission	11-11-2024	16-11-2024	1 Week
Change of Title or Abstract	18-11-2024	23-11-2024	1 Week
1st Review	25-11-2024	28-12-2024	5 Weeks
2nd Review	30-12-2024	01-02-2025	5 Weeks
3rd Review	03-02-2025	08-03-2025	5 Weeks
Thesis Submission	10-03-2025	22-03-2025	2 Weeks
Project Viva-Voce	24-03-2025	29-03-2025	1 Week

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NARASARAOPETA ENGINEERING COLLEGE
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ACADEMIC CALENDAR: AY 2024-25
(M.TECH, MCA & MBA 2024 Admitted batch, Academic Year 2024-25)

M.TECH, MCA & MBA 2024 Batch I Year 1 Semester			
Description	**From Date**	**To Date**	**Weeks**
Commencement of Class Work	16-09-2024		
1st Spell of Instructions	16-09-2024	09-11-2024	8 Weeks
I Mid Examination	11-11-2024	16-11-2024	1 Week
2nd Spell of Instructions	18-11-2024	11-01-2025	8 Weeks
II Mid Examination	13-01-2025	18-01-2025	1 Week
Preparation & Practicals	20-01-2025	25-01-2025	1 Week
End Examinations	27-01-2025	08-02-2025	2 Weeks
M.TECH, MCA & MBA 2024 Batch I Year II Semester			
Description	**From Date**	**To Date**	**Weeks**
Commencement of Class Work	10-02-2025		
1st Spell of Instructions	10-02-2025	05-04-2025	8 Weeks
I Mid Examination	07-04-2025	12-04-2025	1 Week
2nd Spell of Instructions	14-04-2025	07-06-2025	8 Weeks
II Mid Examination	09-06-2025	14-06-2025	1 Week
Preparation & Practicals	16-06-2025	21-06-2025	1 Week
End Examinations	23-06-2025	05-07-2025	2 Weeks
Commencement of III Semester Class Work	07-07-2025		

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NARASARAOPETA ENGINEERING COLLEGE
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ACADEMIC CALENDAR: AY 2024-25
(MCA & MBA 2023 Admitted batch, Academic Year 2024-25)

MCA & MBA 2023 Batch II Year 1 Semester			
Description	**From Date**	**To Date**	**Weeks**
Commencement of Class Work	02-09-2024		
1st Spell of Instructions	02-09-2024	26-10-2024	8 Weeks
I Assignment Examination	30-09-2024	05-10-2024	
I Mid Examination	28-10-2024	02-11-2024	1 Week
2nd Spell of Instructions	04-11-2024	28-12-2024	8 Weeks
II Assignment Examination	02-12-2024	07-12-2024	
II Mid Examination	30-12-2024	04-01-2025	1 Week
Preparation & Practicals	06-01-2025	11-01-2025	1 Week
End Examinations	13-01-2025	25-01-2025	2 Weeks
MCA & MBA 2023 Batch II Year II Semester			
Description	**From Date**	**To Date**	**Weeks**
Commencement of Class Work	27-01-2025		
1st Spell of Instructions	27-01-2025	22-03-2025	8 Weeks
I Assignment Examination	24-02-2025	01-03-2025	
I Mid Examination	24-03-2025	29-03-2025	1 Week
2nd Spell of Instructions	31-03-2025	24-05-2025	8 Weeks
II Assignment Examination	28-04-2025	03-05-2025	
II Mid Examination	26-05-2025	31-05-2025	1 Week
End Examinations	02-06-2025	07-06-2025	1 Week

MCA & MBA 2023 Batch IV Semester (Project Work)

Description	From Date	To Date	Duration
Commencement of Project Work	27-01-2025	24-05-2025	17 Weeks
Thesis Submission Duration	26-05-2025	07-06-2025	2 Weeks

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NARASARAOPETA ENGINEERING COLLEGE
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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC CALENDAR

II-I,III-I,IV-I B.TECH I SEMESTER — **ACADEMIC YEAR: 2024-2025**

Year	Month	M	Tu	W	Th	F	Sa	Su	Total	Calendar Dates	Public Holidays
2024	JUNE						1	2			
		3	4	5	6	7	8	9			
		10	11	12	13	14	15	16	3	13th June:IV-I Class work Commencement	
		17	18	19	20	21	22	23	5		17th June :Bakrid
		24	25	26	27	28	29	30	6	Industrial Visit IV-I	
	JULY	1	2	3	4	5	6	7	6	1st July:III-I Class work Commencement	
		8	9	10	11	12	13	14	6		
		15	16	17	18	19	20	21	5	15-20 July IV-I Assignment Test-I	17th July:Muharram
		22	23	24	25	26	27	28	6	Industrial Visit III-I	
		29	30	31					3	29 July-3 Aug III-I Assignment Test-I	
	AUGUST				1	2	3	4	3	Expert Lecture-I	
		5	6	7	8	9	10	11	6		
		12	13	14	15	16	17	18	5	12-17 August IV-I Mid examinations-I	15th August :Independence Day
		19	20	21	22	23	24	25	6	19th Aug :II-I Class work Commencement/ Workshop -I	
		26	27	28	29	30	31		5	26-31 August III-I Mid examinations-I	26th August Janmastami
	SEPTEMBER							1	0		
		2	3	4	5	6	7	8	5	Industrial Visit II-I	7th September:Ganesh Chaturdhi
		9	10	11	12	13	14	15	6	Expert Lecture-II	
		16	17	18	19	20	21	22	5	16-21 Sep IV-I Assignment Test-II / II-I Assignment Test-I	16th September:Milad - Un -Nabhi
		23	24	25	26	27	28	29	6	Workshop-II	
		30							1	30 Sep-5 Oct III-I Assignment Test-II	
	OCTOBER		1	2	3	4	5	6	6	Expert Lecture-III	2nd October: Gandhi Jayanthi
		7	8	9	10	11	12	13	5		12th October: Dussera
		14	15	16	17	18	19	20	6	14-19 Oct IV-I Mid examinations-II/ II-I Mid examinations-I	
		21	22	23	24	25	26	27	6	21-26 Oct IV-I Preparation & Practicals	
		28	29	30	31				3	28 Oct- 9 Nov IV-I Sem End Examination/ III-I Mid examination-II	31th October: Diwali
	NOVEMBER					1	2	3	2		
		4	5	6	7	8	9	10	6	4-9 Nov III-I Preparation & Practicals	
		11	12	13	14	15	16	17	6	11-23 Nov III-I Sem End Examination	
		18	19	20	21	22	23	24	6	18-23 Nov II-I Assignment-II	
		25	26	27	28	29	30		5		
	DECEMBER							1	0		
		2	3	4	5	6	7	8	6		
		9	10	11	12	13	14	15	6		
		16	17	18	19	20	21	22	6	16-21 Dec II-I Mid Examination-II	
		23	24	25	26	27	28	29	5	23-28 Dec II-I Preparation & Practicals	25th December:Christmas
		30	31						2	30 Dec-11 Jan II-I Sem End Examination	

Classwork Examinations | Public Holidays | Industrial Visits | Expert Lectures | Workshop | Preparation & Practicals | Sundays

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DEPARTMENT OF CIVIL ENGINEERING
NARASARAOPETA ENGINEERING COLLEGE
NARASARAOPET - 522

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC CALENDAR

II-II,III-II,IV-II B.TECH II SEMESTER — ACADEMIC YEAR: 2024-2025

Year	Month	M	Tu	W	Th	F	Sa	Su	Total	Calendar Dates	Public Holidays
2024	NOVEMBER					1	2	3	2		
		4	5	6	7	8	9	10	6		
		11	12	13	14	15	16	17	6	11th Nov:IV-II Class work Commencement/ 11-16th Nov:Abstract Submission	
		18	19	20	21	22	23	24	6	18th- 23rd Nov Change of Title or Abstract	
		25	26	27	28	29	30		6	25th Nov -28th Dec 1st Review /25th Nov III-II Class work Commencement	
	DECEMBER							1	0		
		2	3	4	5	6	7	8	6		
		9	10	11	12	13	14	15	6	Expert Lecture-I	
		16	17	18	19	20	21	22	6		
		23	24	25	26	27	28	29	5	23rd-28th Dec III-II Assignment Test-I	25th December:Christmas
		30	31						2	30 Dec- 1st Feb 2nd Review	
2025	JANUARY			1	2	3	4	5	4		
		6	7	8	9	10	11	12	6	Workshop-I	
		13	14	15	16	17	18	19	5	13th Jan II-II Class work Commencement	14th Jan:Pongal
		20	21	22	23	24	25	26	6	20-25 Jan III-II Mid examinations-I	
		27	28	29	30	31			5		
	FEBRUARY						1	2	1		
		3	4	5	6	7	8	9	6	3rd Feb- 8th March 3rd Review	
		10	11	12	13	14	15	16	5	10th-15th Feb II-II Assignment Test-I/III-II Mid examinations-I	
		17	18	19	20	21	22	23	5	Expert Lecture-II	
		24	25	26	27	28			4	24th Feb-1st March III-II Assignment Test-II	26th Feb:Maha Sivaratri
	MARCH						1	2	1		
		3	4	5	6	7	8	9	6		
		10	11	12	13	14	15	16	5	10th -22 nd March Thesis Submission	14th March:Holi
		17	18	19	20	21	22	23	6	Workshop-II	
		24	25	26	27	28	29	30	6	24th - 29th March Project Viva -Voce/III-II Mid examinations-II	
		31							0	31st March-5 th April III-II Preparation& Practicals	31st March:Ramzan
	APRIL		1	2	3	4	5	6	5		
		7	8	9	10	11	12	13	6	7-19th April III-II Semester End Examinations	
		14	15	16	17	18	19	20	5	14th -19th April II-II Assignment Test-II	18th April:Good Friday
		21	22	23	24	25	26	27	6	ICETICE-2K25	
		28	29	30					3		
	MAY				1	2	3	4	3		
		5	6	7	8	9	10	11	6		
		12	13	14	15	16	17	18	6	12-17th May II-II Mid examinations-II	
		19	20	21	22	23	24	25	6	19th May-24 th May II-II Preparation& Practicals	
		26	27	28	29	30	31		6	26th May- 7th June II-II Semester End Examinations	

Classwork Examinations | Public Holidays | Industrial Visits | Expert Lectures | Workshop | Preparation & Practicals | Sundays

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

DEPARTMENT OF MASTER OF BUSINESS ADMINISTRATION
DEPARTMENT PROPOSED ACADEMIC CALENDER (2024 - 2025)

MBA 2024 BATCH I YEAR I SEMESTER					
Description	From Date	To Date	Duration	Faculty	Students
				Proposed Co-Curriculum Activities	Proposed Co-Curriculum Activities
Commencement of Class Work	02-09-2024		8 Weeks	FDP/STTP -01	Training Programs-01
1st Spell of Instructions	02-09-2024	26-10-2024			
I Assignment Examination	30-09-2024	05-10-2024			Workshops -01
I Mid Examination	28-10-2024	02-11-2024	1 Weeks	-	-
2nd Spell of Instructions	04-11-2024	28-12-2024	8 Weeks	FDP/STTP -01	-
II Assignment Examination	02-12-2024	07-12-2024		-	Industrial Visits -01
II Mid Examination	30-12-2024	04-01-2025	1 Weeks	-	-
Preparation &Practical's	06-01-2025	11-01-2025	1 Weeks	-	-
End Examinations	13-01-2025	25-01-2025	2 Weeks	-	-

MBA 2024 BATCH I YEAR II SEMESTER					
Description	From Date	To Date	Duration	Faculty	Students
				Proposed	Proposed
Commencement of Class Work	27-01-202			FDP/STTP -01	Training Programs-01
1st Spell of Instructions	27-01-2025	22-03-2025	8 Weeks		Technical Event – 01
I Assignment Examination	24-02-2025	01-03-2025	1 Weeks	-	-
I Mid Examination	24-03-2025	29-03-2025	1 Weeks	FDP/STTP -01	Guest Lecture -01
2nd Spell of Instructions	31-03-2025	24-05-2025	8 Weeks	-	-
II Assignment Examination	28-04-2025	03-05-2025		-	-
II Mid Examination	26-05-2025	31-05-2025	1 Weeks	-	-
End Examinations	02-06-2025	07-06-2025	1 Weeks	-	-

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NARASARAOPET - 522 601, Palnadu (Dist.), A.P.

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Department of M.B.A
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(AUTONOMOUS)

DEPARTMENT OF MASTER OF BUSINESS ADMINISTRATION
DEPARTMENT PROPOSED ACADEMIC CALENDER (2025 - 2026)

MBA 2024 BATCH III SEMESTER					
Description	From Date	To Date	Duration	Faculty	Students
				Proposed Co-Curriculum Activities	Proposed Co-Curriculum Activities
Commencement of Class Work	07-07-2025			FDP/STTP -02	Training Programs-01
1st Spell of Instructions	07-07-2025	30-08-2025	8 Weeks		Workshops -01
I Mid Examination	01-09-2025	06-09-2025	1 Weeks	-	-
2nd Spell of Instructions	08-09-2025	08-11-2025	9 Weeks	FDP/STTP -02	-
II Mid Examination	10-11-2025	15-11-2025	1 Weeks	-	-
Preparation &Practical's	17-11-2025	22-11-2025	1 Weeks	-	Industrial Visits -01
End Examinations	24-11-2025	06-12-2025	2 Weeks	-	-
Number of Working Days	92				

MBA 2024 BATCH IV SEMESTER					
Description	From Date	To Date	Duration	Faculty	Students
				Proposed	Proposed
Commencement of Class Work	08-12-2025		8 Weeks	FDP/STTP -01	Training Programs-01
1st Spell of Instructions	08-12-2025	07-02-2026			Technical Event – 01
I Mid Examination	09-02-2026	14-02-2026		-	-
2nd Spell of Instructions	16-02-2026	11-04-2026	1 Weeks	FDP/STTP -02	Guest Lecture -01
II Mid Examination	13-04-2026	18-04-2026	8 Weeks	-	-
Preparation &Practical's	20-04-2026	25-04-2026		-	-
End Examinations	27-04-2026	02-05-2026	1 Weeks	-	-
Number of Working Days	90				

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NARASARAOPET - 522 601.

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NARASARAOPETA
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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

DEPARTMENT PROPOSED ACADEMIC CALENDER (2024 - 2025)

B.Tech 2021 Batch IV Year I Semester					
Description	From Date	To Date	Duration	Faculty	Students
				Proposed Co-Curriculum Activities	Proposed Co-Curriculum Activities
Commencementof ClassWork	13-06-2024		8Weeks	FDP/STTP -01	Training Programs-01
1st Spell of Instructions	13-06-2024	10-08-2024			
Assignment Test-I	13-07-2025	20-07-2024			Workshops -01
I Mid Examinations	12-08-2024	17-08-2024	1 Week		
2nd Spell of Instructions	19-08-2024	12-10-2024	8Weeks	FDP/STTP -01	
Assignment Test-II	16-09-2024	21-09-2024		-	Industrial Visits -01
II Mid Examinations	14-10-2024	19-10-2024	1 Week	-	
Preparation&Practicals	21-10-2024	26-10-2024	1 Week		
Semester End Examinations	28-10-2024	09-11-2024	2 Weeks		

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B.Tech 2021 Batch IV Year II Semester					
Description	From Date	To Date	Duration	Faculty	Students
				Proposed Co-Curriculum Activities	Proposed Co-Curriculum Activities
Commencementof ClassWork	11-11-2024			FDP/STTP -01	Training Programs-01
Abstract submission	11-11-2024	16-11-2024	1 Week		Guest Lecture -01
change of title or Abstract	18-11-2024	23-11-2024	1 Week	-	-
1 st Review	25-11-2024	28-12-2024	5 Week	FDP/STTP -01	Technical Event - 01
2nd Review	30-12-2024	01-02-2025	5 Week	-	-
3rd Review	03-02-2025	08-03-2025	5 Week	-	-
Thesis submission	10-03-2025	22-03-2025	2 Week	-	-
Project viva -voce	24-03-2025	29-03-2025	1 Week		

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NARASARAOPETA ENGINEERING COLLEGE
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(AUTONOMOUS)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

DEPARTMENT PROPOSED ACADEMIC CALENDER (2024 - 2025)

B.Tech 2022 Batch III Year I Semester					
Description	From Date	To Date	Duration	Faculty	Students
				Proposed Co-Curriculum Activities	Proposed Co-Curriculum Activities
Commencement of Class Work	01-07-2024		8 Weeks	FDP/STTP -02	Training Programs-01
1st Spell of Instructions	01-07-2024	24-08-2024			Workshops -01
I Assignment Test	29-07-2024	03-08-2024			
I Mid Examinations	26-08-2024	31-08-2024	1 Week	-	-
2nd Spell of Instructions	02-09-2024	26-10-2024	8 Weeks	FDP/STTP -02	Model Competition -01
II Assignment Test	30-09-2024	05-10-2024			
II Mid Examinations	28-10-2024	02-11-2024	1 Week	-	-
Preparation & Practicals	04-11-2024	09-11-2024	1 Week	-	-
Semester End Examinations	11-11-2024	23-11-2024	2 Week	-	-

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B.Tech 2022 Batch III Year II Semester					
Description	From Date	To Date	Duration	Faculty	Students
				Proposed Co-Curriculum Activities	Proposed Co-Curriculum Activities
Commencement of Class Work	25-11-2024		8 Weeks	FDP/STTP -01	Training Programs-02
1st Spell of Instructions	25-11-2024	18-01-2025			Guest Lecture -01
I Assignment Test	23-12-2024	28-12-2024		-	-
I Mid Examinations	20-01-2025	25-01-2025	1 Week	FDP/STTP -02	Technical Event - 01
2nd Spell of Instructions	27-01-2025	22-03-2025	8 Weeks	-	-
II Assignment Test	24-02-2025	01-03-2025		-	-
II Mid Examinations	24-03-2025	29-03-2025	1 Week	-	-
Preparation and Practicals	31-03-2025	05-04-2025	1 Week	-	
Semester End Examinations	07-04-2025	19-04-2025	2 Week		

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

DEPARTMENT PROPOSED ACADEMIC CALENDER (2024 - 2025)

B.Tech 2023 Batch II Year I Semester					
Description	From Date	To Date	Duration	Faculty	Students
				Proposed Co-Curriculum Activities	Proposed Co-Curriculum Activities
Commencement of Class Work	19-08-2024		8Weeks	FDP/STTP-02	Training Programs-01
1st Spell of Instructions	19-08-2024	12-10-2024			
I Assignment Test	16-09-2024	21-09-2024			Industrial Visits -01
I Mid Examinations	14-10-2024	19-10-2024	1 Week		
2nd Spell of Instructions	21-10-2024	14-12-2024	8 Weeks		
II Assignment Test	18-11-2024	23-11-2024		-	-
II Mid Examinations	16-12-2024	21-12-2024	1 Week	FDP/STTP -02	
Preparation and Practicals	23-12-2024	28-12-2024	1 Week		
Semester End Examinations	30-12-2024	11-01-2025	2 Week		

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B.Tech 2023 Batch II Year II Semester					
Description	From Date	To Date	Duration	Faculty	II Year I Semester
				Proposed Co-Curriculum Activities	Proposed Co-Curriculum Activities
Commencement of Class Work	13-01-2025		8 Weeks	FDP /STTP-02	Training Programs-03
1st Spell of Instructions	13-01-2025	08-03-2025			Guest Lecture -01
I Assignment Test	10-02-2025	15-02-2025			Industrial Visits -01
I Mid Examinations	10-03-2025	15-03-2025	1 Week		
2nd Spell of Instructions	17-03-2025	10-05-2025	8 Weeks	-	-
II Assignment Test	14-04-2025	19-04-2025		FDP/STTP -02	Technical Event - 01
II Mid Examinations	12-05-2025	17-05-2025	1 Week		Guest Lecture -01
Preparation and Practicals	19-05-2025	24-05-2025	1 Week		
Semester End Examinations	26-05-2025	07-06-2025	2 Week	-	-

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DEPARTMENT OF INFORMATION TECHNOLOGY

DEPARTMENT PROPOSED ACADEMIC CALENDER (2024 - 2025)

B.Tech 2021 Batch IV Year I Semester					
Description	From Date	To Date	Duration	Faculty	Students
				Proposed Co-Curriculum Activities	Proposed Co-Curriculum Activities
Commencementof ClassWork	13-06-2024		8 Weeks	FDP/STTP -01	Training Programs-02
1st Spell of Instructions	13-06-2024	10-08-2024			-
Assignment Test-I	15-07-2025	20-07-2024			Workshops -02
I Mid Examinations	12-08-2024	17-08-2024	1 Week	-	-
Gate/Remedial Classes	19-08-2024	23-08-2024	1 Week		
2nd Spell of Instructions	19-08-2024	12-10-2024	8 Weeks	FDP/STTP -01	-
Assignment Test-II	16-09-2024	21-09-2024		-	Industrial Visits -01
II Mid Examinations	14-10-2024	19-10-2024	1 Week	-	-
Preparation&Practicals	21-10-2024	26-10-2024	1 Week	-	-
Semester End Examinations	28-10-2024	09-11-2024	2 Weeks	-	-

B.Tech 2021 Batch IV Year II Semester					
Description	From Date	To Date	Duration	Faculty	Students
				Proposed Co-Curriculum Activities	Proposed Co-Curriculum Activities
Commencementof ClassWork	11-11-2024			FDP/STTP -01	Training Programs-01
Abstract submission	11-11-2024	16-11-2024	1 Week		Guest Lecture -01
change of title or Abstract	18-11-2024	23-11-2024	1 Week	-	-
1 st Review	25-11-2024	28-12-2024	5 Week	FDP/STTP -01	Technical Event - 01
2nd Review	30-12-2024	01-02-2025	5 Week	-	-
3rd Review	03-02-2025	08-03-2025	5 Week	-	-
Thesis submission	10-03-2025	22-03-2025	2 Week	-	-
Project viva -voce	24-03-2025	29-03-2025	1 Week	-	-

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DEPARTMENT OF INFORMATION TECHNOLOGY

DEPARTMENT PROPOSED ACADEMIC CALENDER (2024 - 2025)

B.Tech 2022 Batch III Year I Semester					
Description	From Date	To Date	Duration	Faculty	Students
				Proposed Co-Curriculum Activities	Proposed Co-Curriculum Activities
Commencement of Class Work	01-07-2024		8 Weeks	FDP/STTP -01	Training Programs-01
1st Spell of Instructions	01-07-2024	24-08-2024			Workshops -01
I Assignment Test	29-07-2024	03-08-2024			-
I Mid Examinations	26-08-2024	31-08-2024	1 Week	-	-
2nd Spell of Instructions	02-09-2024	26-10-2024	8 Weeks	FDP/STTP -01	Technical Competition -01
II Assignment Test	30-09-2024	05-10-2024			
II Mid Examinations	28-10-2024	02-11-2024	1 Week	-	-
Preparation & Practicals	04-11-2024	09-11-2024	1 Week	-	-
Semester End Examinations	11-11-2024	23-11-2024	2 Week	-	-

B.Tech 2022 Batch III Year II Semester					
Description	From Date	To Date	Duration	Faculty	Students
				Proposed Co-Curriculum Activities	Proposed Co-Curriculum Activities
Commencement of Class Work	25-11-2024		8 Weeks	FDP/STTP -01	Training Programs-02
1st Spell of Instructions	25-11-2024	18-01-2025			Guest Lecture -01
I Assignment Test	23-12-2024	28-12-2024		-	-
I Mid Examinations	20-01-2025	25-01-2025	1 Week	FDP/STTP -01	Technical Event - 01
2nd Spell of Instructions	27-01-2025	22-03-2025	8 Weeks	-	-
II Assignment Test	24-02-2025	01-03-2025		-	-
II Mid Examinations	24-03-2025	29-03-2025	1 Week	-	-
Preparation and Practicals	31-03-2025	05-04-2025	1 Week	-	-
Semester End Examinations	07-04-2025	19-04-2025	2 Week	-	-

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DEPARTMENT OF INFORMATION TECHNOLOGY

DEPARTMENT PROPOSED ACADEMIC CALENDER (2024 - 2025)

B.Tech 2023 Batch II Year I Semester					
Description	**From Date**	**To Date**	**Duration**	**Faculty**	**Students**
				Proposed Co-Curriculum Activities	**Proposed Co-Curriculum Activities**
Commencement of Class Work	19-08-2024		8Weeks	FDP/STTP-02	Training Programs-01
1st Spell of Instructions	19-08-2024	12-10-2024			-
I Assignment Test	16-09-2024	21-09-2024			Industrial Visits -01
I Mid Examinations	14-10-2024	19-10-2024	1 Week		
2nd Spell of Instructions	21-10-2024	14-12-2024	8 Weeks	-	-
II Assignment Test	18-11-2024	23-11-2024		-	-
II Mid Examinations	16-12-2024	21-12-2024	1 Week	FDP/STTP -01	-
Preparation and Practicals	23-12-2024	28-12-2024	1 Week		-
Semester End Examinations	30-12-2024	11-01-2025	2 Week	-	-

B.Tech 2023 Batch II Year II Semester					
Description	**From Date**	**To Date**	**Duration**	**Faculty**	**II Year I Semester**
				Proposed Co-Curriculum Activities	**Proposed Co-Curriculum Activities**
Commencement of Class Work	13-01-2025		8 Weeks	-	Training Programs-02
1st Spell of Instructions	13-01-2025	08-03-2025		-	Guest Lecture -01
I Assignment Test	10-02-2025	15-02-2025		-	Industrial Visits -01
I Mid Examinations	10-03-2025	15-03-2025	1 Week	-	-
2nd Spell of Instructions	17-03-2025	10-05-2025	8 Weeks	-	-
II Assignment Test	14-04-2025	19-04-2025		-	Technical Event - 01
II Mid Examinations	12-05-2025	17-05-2025	1 Week	-	Guest Lecture -01
Preparation and Practicals	19-05-2025	24-05-2025	1 Week	-	-
Semester End Examinations	26-05-2025	07-06-2025	2 Week	-	-

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NARASARAOPETA ENGINEERING COLLEGE (AUTONOMOUS)

DEPARTMENT OF CSE (AIML), CSE (CS), CSE (DS)

EVENT CALENDAR FOR THE A.Y. 2024-25

III Year:

S.NO.	SCHEDULE	EVENT
1	July 1st Week	Guest Lecture / Seminar
2	July 2nd Week	Session on Self Introduction and Resume Writing
3	July 4th Week	One Week Workshop
4	September 3rd Week	Hack-a-thon
5	December 2nd Week	One Week Workshop
6	January 2nd Week	Guest Lecture / Seminar

II Year:

S.NO.	SCHEDULE	EVENT
1	September 1st Week	Guest Lecture / Seminar
2	September 3rd Week	One Week Workshop
3	January	Guest Lecture / Seminar
4	February	One Week Workshop

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Head of the Department
CSE (AIML, Cyber Security, Data Science)
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NARASARAOPETA ENGINEERING COLLEGE
(Autonomous)
COMPUTER SCIENCE AND ENGINEERING
Calendar of Events
Even Semester : 2024-25

Week No.	Month	Week Days							No.of Working Days	Events
		Mon	Tue	Wed	Thu	Fri	Sat	Sun		
1	Nov	11	12	13	14	15	16	17	6	Nov 11th : Commencement of class work for 4th year II Semester
2	Nov	18	19	20	21	22	23	24	6	
3	Nov-Dec	25	26	27	28	29	30	1	6	Nov 25th : Commencement of class work for 3rd year II Semester 25-11-2024 to 27-11-2024: Workshop On Mastering GITHUB For Collabative Development
4	Dec	2	3	4	5	6	7	8	6	
5	Dec	9	10	11	12	13	14	15		09-12-2024 to 14-12-2024 : Workshop on UI/UX
6	Dec	16	17	18	19	20	21	22		
7	Dec	23	24	25	26	27	28	29		Dec 23rd to 30th : II Assignment Exam for III B.Tech II Semester 26-12-2024 to 10-01-2025: Workshop on INNOVATIVE WEB DESIGN USING REACT JS
8	Dec-Jan	30	31	1	2	3	4	5		Jan 1st : Happy New Year
9	Jan	6	7	8	9	10	11	12		
10	Jan	13	14	15	16	17	18	19		Jan 1st : Commencement of class work for 2nd year II Semester Jan 13th to 19th : Happy Sanrkanthi holidays
11	Jan	20	21	22	23	24	25	26		Jan 20th to 27th : I Mid Exam for III B.Tech II Semester
12	Jan-Feb	27	28	29	30	31	1	2		
13	Feb	3	4	5	6	7	8	9		
14	Feb	10	11	12	13	14	15	16		
15	Feb	17	18	19	20	21	22	23		Feb 17th to 22nd : I Assignment Exam for II B.Tech II Semester
16	Feb-Mar	24	25	26	27	28	1	2		Feb 24th to 04th : II Assignment Exam for II B.Tech I Semester Feb 26th : Maha Sivarathri
17	Mar	3	4	5	6	7	8	9		10-03-2025 to 15-03-2025: A One week Innovative Workshop on AMAZON WEB SERVICES (AWS) 03-03-2025 to 08-03-2025: A One Week Hands on Workshop on DEEP LEARNING AND LLMS FOR SUSTAINABLE DEVELOPMENT

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18	Mar	10	11	12	13	14	15	16		Mar 10th to 17th : I Mid Exam for II B.Tech II Semester 10-03-2025 to 15-03-2025: A One Week Innovative Workshop on AMAZON WEB SERVICES [AWS] 12-03-2025 to 18-03-2025: A One Week Hands-on Workshop on PROJECT BASED LEARNING ON ML, DL, & NLP
19	Mar	17	18	19	20	21	22	23		Mar 22nd to 29th : II Mid Exam for III B.Tech II Semester
20	Mar	24	25	26	27	28	29	30		
21	Mar-Apr	31	1	2	3	4	5	6		Mar 31st : Ramzan
	Apr	7	8	9	10	11	12	13		Apr 7th to 23rd: III B.Tech II Semester Regular End Examinations.
22	Apr	14	15	16	17	18	19	20		Apr 15th to 22nd : II Assignment Exam for II B.Tech II Semester Apr 14th : Dr B.R.Ambedkar Jayanthi Apr 18th : Goodfriday
23	Apr	21	22	23	24	25	26	27		
24	Apr-May	28	29	30	31	1	2	3		
25	May	4	5	6	7	8	9	10		
26	May	11	12	13	14	15	16	17		May 16th to 22nd : II Mid Exam for II B.Tech II Semester
27	May	18	19	20	21	22	23	24		
28	May	25	26	27	28	29	30	31		May 27th to June 06th: II B.Tech II Semester Regular End Examinations.
29	June	1	2	3	4	5	6	7		
30	June	8	9	10	11	12	13	14		
31	June	15	16	17	18	19	20	21		
32	June	22	23	24	22	23	24	25		
33	June-July	26	27	28	29	30	1	2		

Nov 11th : Commencement of class work for 4th year II Semester

Nov 25th : Commencement of class work for 3rd year II Semester

Jan 1st : Commencement of class work for 2nd year II Semester

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PROFESSOR &
Dept. of Computer Science
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NARASARAOPET - 522 601. Guntur

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NARASARAOPETA ENGINEERING COLLEGE
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COMPUTER SCIENCE AND ENGINEERING
Calendar of Events
Odd Semester: 2024-25

Week No.	Month	Week Days							No.of Working Days	Events
		Mon	Tue	Wed	Thu	Fri	Sat	Sun		
1	June				13	14	15	16	3	June 13th: Commencement of class work for 4th year I Semester June 15th to 22nd : Hackathon Express (Fast Track to Coding Excellence for 1st yearstudents organized by CH.Rajani, Dr. E. Rama Krishna & Dr. K.Suresh Babu.
2	June	17	18	19	20	21	22	23	6	
3	June	24	25	26	27	28	29	30	6	June 24th to 28th: Faculty Enablement Program on Artificial Intelligence organized by Mrs. Girija T R, Mrs. Pruthvi Adisesha for faculty.
	July	1	2	3	4	5	6	7	6	July 1st : Commencement of class work for 3rd year I Semester July 1st to 5th: Faculty Enablement Program on Java Programming organized by Mrs. Girija T R, Mrs. Pruthvi Adisesha for faculty(Online Infosys).
5	July	8	9	10	11	12	13	14	6	July 8th to 13th : II Assignment Exam for I M.Tech II Semester
6	July	15	16	17	18	19	20	21	6	July 15th to 22nd : I Mid Exam for IV B.Tech I Semester July 18th to 20th: Hackathon in Java Linked list (LeetCode Problem Solving) organized by Lara Technologies for Students. July 15th to 9th:Faculty Enablement Program on DevOps organized by Mrs. Girija T R, Mrs. Pruthvi Adisesha for faculty (Online Infosys).
7	July	22	23	24	25	26	27	28	6	
	July-Aug	29	30	31	1	2	3	4	6	July 29th to Aug 3rd : I Assignment Exam for III B.Tech I Semester
9	Aug	5	6	7	8	9	10	11	6	Aug 19th : Commencement of class work for 2nd year I Semester Aug 5th to 7th : II Mid Exam for I M.Tech II Semester
10	Aug	12	13	14	15	16	17	18	5	Aug 12th to 19th : I Mid Exam for IV B.Tech I Semester Aug 16th: Varalakshmi Vratam
11	Aug	19	20	21	22	23	24	25	6	Aug 19th to 31st : 2023 Batch I M.Tech II Semester Regular End Examinations.
12	Aug-Sept	26	27	28	29	30	31	1	6	Aug 26th to Sept 2nd : I Mid Exam for III B.Tech I Semester Aug 26th to 31st: A One Week Workshop on Devops And Its Tools organized by VSRIT Solutions for
13	Sept	2	3	4	5	6	7	8	5	Sept 7th: Vinayaka Chavithi

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14	Sept	9	10	11	12	13	14	15	6	Sept 9th to 14th: A One Week Workshop on Androi APP Development Using Kotlin (Part-2) organized by Affluent GS with Happiest mind for Students.
15	Sept	16	17	18	19	20	21	22	5	Sept 16th : Commencement of class work for M.Tech I year I Semester Sept 17th to 23rd : II Assignment Exam for IV B.Tech I Semester Sept 17th to 23rd : II Assignment Exam for II B.Tech I Semester Sept 17th to 30th: An Innovative Coding Skills Implementation in Pyhton organized by Trainer cum Developer APSSDC for Students. Sept 16th: Milad-Un-Nabi
16	Sept	23	24	25	26	27	28	29	6	
17	Sept-Oct	30	1	2	3	4	5	6	5	Oct 3rd to 5th : II Assignment Exam for III B.Tech I Semester Oct 2nd: Gandhi Jayanthi
18	Oct	7	8	9	10	11	12	13	3	Oct 10th to 14th: Dasara Holidays
19	Oct	14	15	16	17	18	19	20	5	
20	Oct	21	22	23	24	25	26	27	5	Ot 15th to 22nd : I Mid Exam for IV B.T I Semester Oct 24th to Nov 2nd : II Mid Exam for III B.Tech I Semester. Oct 15th to 18th : I Mid Exam for II B.Tech I Semester Oct 24th to 19th: IV B.Tech I Semester Regular End Examinatios.
21	Oct-Nov	28	29	30	31	1	2	3	5	Oct 31st: Diwali
22	Nov	4	5	6	7	8	9	10	6	Nov 4th to 18th: III B.Tech I Semester Regular End Examinations.
23	Nov	11	12	13	14	15	16	17	6	
24	Nov	18	19	20	21	22	23	24	6	
25	Nov-Dec	25	26	27	28	29	30	1	6	
26	Dec	2	3	4	5	6	7	8	6	
27	Dec	9	10	11	12	13	14	15	6	
28	Dec	16	17	18	19	20	21	22	6	
29	Dec	23	24	25	26	27	28	29	5	Dec 25th: Christmas
30	Dec-Jan	30	31	1	2	3	4	5		
31	Jan	6	7	8	9	10	11			

July 24th : Commencement of Class Wok for II Year I Semester

June 12th: Commencement of Class Wok for III Year I Semester

July 24th : Commencement of Class Work for IV Year I Semester

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TEACHING PLANS

AY 2024-25

NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN: 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CE2103	STRENGTH OF MATERIALS	II-I	Civil Engineering	5	-

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	To understand the basic materials behavior under the influence of different external loading conditions and the support conditions.
CO2	To draw the diagrams indicating the variation of the key performance features like axial forces, bending moment and shear forces in structural members.
CO3	To acquire knowledge of bending concepts and calculation of section modulus and for determination of stresses developed in the beams.
CO4	To analyze the deflections due to various loading conditions.
CO5	To assess stresses across section of the thin, thick cylinders and columns to arrive at optimum sections to withstand the internal pressure using Lame's equation

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
UNIT – I : Simple Stresses and Strains:						
1	**CO1**: To understand the basic materials behavior under the influence of different external loading conditions and the support conditions.	1.1	Elasticity and plasticity	T1, T2, R1	1	Chalk & Talk
		1.2	Types of stresses and strains	T1, T2, R4	1	Chalk & Talk
		1.3	Hooke's law	T1, T2, R1	1	Chalk & Talk
		1.4	Factor of safety,	T1, T2, R2	1	Chalk & Talk
		1.5	Poisson's ratio	T1, T2, R1	1	Chalk & Talk
		1.6	Relationship between Elastic constants	T1, T2, R4	2	PPT, Active Learning
		1.7	Bars of varying section	T1, T2, R1	1	Chalk & Talk
		1.8	Stresses in composite bars	T1, T2, R3	1	Chalk & Talk
		1.9	Problems on bars of varying section	T1, T2, R1	1	Chalk & Talk
		UNIT – II : Shear Force and Bending Moment:				
		2.1	Definition of beam	T1, T2, R3	1	Chalk , Talk
		2.2	Types of beams	T1, T2, R3	1	PPT, Chalk , Talk

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2	**CO2:** To draw the diagrams indicating the variation of the key performance features like axial forces, bending moment and shear forces in structural members	2.3	Concept of shear force and bending moment	T1, T2, R4	2	PPT, Active Learning & Quiz
		2.4	Point of contra flexure	T1, T2, R3	2	case study & Tutorial
		2.5	Relation between S.F., B.M and rate of loading at a section of a beam	T1, T2, R1	2	Chalk , Talk & PPT
		2.6	S.F and B.M diagrams for cantilever	T1, T2, R3	1	PPT, Active Learning
		2.7	simply supported	T1, T2, R2	1	Chalk ,Talk & NPTEL
		2.8	overhanging beams subjected to point loads	T1, T2, R2	2	Chalk & Talk, PPT, Tutorial
		2.9	uniformly distributed loads,	T1, T2, R1	1	Chalk & Talk, PPT, Tutorial
		2.10	uniformly varying loads,	T1, T2, R3	1	Chalk & Talk, PPT, Tutorial
		2.11	partial uniformly distributed loads	T1, T2, R3	2	Chalk & Talk, PPT, Tutorial
		2.12	couple and combination of these loads.	T1, T2, R3	1	Chalk & Talk, PPT, Tutorial
		2.13	Problems on Cantilever beams with different loading conditions	T1, T2, R1	2	Chalk & Talk
		2.14	Problems on Simply supported beams with different loading conditions	T1, T2, R1	2	Chalk & Talk
3	**CO3:** To acquire knowledge of bending concepts and calculation of section modulus and for determination of stresses developed in the beams.	**UNIT – III : Flexural and Shear Stresses:**				
		3.1	**Flexural Stresses:** Theory of simple bending Assumptions	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial
		3.2	Derivation of bending equation, Neutral axis	T1, T2, R1	1	Chalk & Talk, PPT, Tutorial
		3.3	Determination of bending stresses	T1, T2, R1	2	PPT, Active Learning
		3.4	section modulus of rectangular and (Solid and Hollow)	T1, T2, R1	2	PPT, Active Learning
		3.5	circular sections(Solid and Hollow),	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial
		3.6	I, T, Angle and Channel sections	T1, T2, R1	2	PPT, Active Learning
		3.7	Design of simple beams	T1, T2, R1	2	PPT, Active Learning
		MID EXAMINATIONS-I				

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		3.8	**Shear Stresses:** Derivation of formula	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial
		3.9	Shear stress distribution across various beam sections like rectangular	T1, T2, R1	1	Chalk & Talk,
		3.10	Shear stress distribution across various beam sections like circular,	T1, T2, R2	1	PPT, Tutorial
		3.11	I, T Angle sections.	T1, T2, R3	1	Chalk & Talk
		3.12	**Torsion** – circular shafts only.	T1, T2, R2	1	PPT, Tutorial
4	**CO4:** To have knowledge of deflections due to various loading conditions	**UNIT – IV : Deflection of Beams:**				
		4.1	Double integration	T1, T2, R3	1	Chalk , Talk & PPT
		4.2	Macaulay's methods	T1, T2, R3	1	Chalk & Talk
		4.3	Determination of slope and deflection for cantilever	T1, T2, R3	2	Chalk & Talk
		4.4	simply supported	T1, T2, R3	1	PPT, Active Learning
		4.5	overhanging beams subjected to point loads,	T1, T2, R3	1	case study & Tutorial
		4.6	uniformly distributed loads,	T1, T2, R2	1	Chalk , Talk & PPT
		4.7	uniformly varying loads	T1, T2, R2	1	PPT, Active Learning
		4.8	Partial uniformly distributed loads	T1, T2, R3	1	Chalk ,Talk & Model demonstration
		4.9	couple and combination of these loads	T1, T2, R3	1	Chalk ,Talk
		4.10	Mohr's theorems	T1, T2, R3	1	Chalk & Talk, PPT, Tutorial
		4.11	Moment area method	T1, T2, R3	1	Chalk & Talk,
		4.12	Application to simple cases of cantilever.	T1, T2, R3	1	PPT, Tutorial
		UNIT – V: Columns, Thin and Thick cylindrical:				
		5.1	Introduction	T1, T2, R3	1	Chalk ,Talk & Tutorial
		5.2	Classification of columns	T1, T2, R2	1	PPT, Quiz & Active Learning

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5	**CO 5:** To assess stresses across section of the thin, thick cylinders and columns to arrive at optimum sections to withstand the internal pressure using Lame's equation	5.3	Axially loaded compression member	T1, T2, R3	2	PPT, Active Learning
		5.4	Euler's crippling load theory	T1, T2, R3	2	case study
		5.5	Derivation of Euler's critical load formulae for various end conditions	T1, T2, R4	2	Chalk , Talk & Model demonstration
		5.6	Equivalent length	T1, T2, R2	1	Chalk , Talk
		5.7	Slenderness ratio	T1, T2, R3	1	PPT, Active Learning
		5.8	Limitations of Euler's theory	T1, T2, R3	1	Chalk , Talk
		5.9	Rankine ,Gordon formula	T1, T2, R4	1	Chalk , Talk
		5.10	Eccentric loading and Secant formula	T1, T2, R2	1	Chalk , Talk
		5.11	Prof. Perry's formula.	T1, T2, R3	1	Chalk , Talk
		5.12	**Thin and Thick cylindrical** shells	T1, T2, R3	1	Chalk , Talk
		5.13	Derivation of formula for longitudinal and circumferential stresses	T1, T2, R3	1	PPT, Active Learning
		5.14	hoop, longitudinal and volumetric strains	T1, T2, R3	1	Chalk ,Talk
		5.15	Changes in diameter, and volume of thin cylinders.	T1, T2, R3	1	Chalk , Talk
		5.16	Lames theory for thick cylinders	T1, T2, R4	1	Chalk , Talk
		5.17	Derivation of Lames formulae	T1, T2, R2	1	Chalk , Talk
		5.18	distribution of hoop and radial stresses across the thickness	T1, T2, R3	1	Chalk , Talk
		5.19	compound cylinders	T1, T2, R3	1	Chalk , Talk
		5.20	Distribution of stresses	T1, T2, R4	1	Chalk , Talk
MID EXAMINATIONS-II						
				Total	18	
END EXAMINATIONS						

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TEXT BOOKS:

T	BOOK TITLE/AUTHORS/PUBLISHER
T1	Strength of Materials by R. K. Bansal, Lakshmi Publications, 16th Edition, 2022.
T2	Strength of Materials by B. S. Basavarajaiah and P. Mahadevappa, Universities Press 3rd Edition, 2010.
T3	Strength of Materials by J.K. Gupta and S.K. Gupta, Cengage publications 2nd edition, 2024.

REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Advanced Mechanics of Solids, L.S Srinath, McGraw Hill Education, 2017, 3rd Edition
R2	Strength of Materials- Fundamentals and Application .D.GunneswaraRao and Mudim by Andal, Cambridge University Press, 2018, 1st Edition
R3	Mechanics of Materials, Beer and Johnston, McGraw Hill India Pvt. Ltd., 2020, 8th Edition (SI Units).
R4	Mechanics of Solids — E P Popov, Prentice Hall, 2nd Edition, 2015.

Signature of faculty

Head of the Department

Signature of Principal

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CE2104	FLUID MECHANICS (R23)	II-I	Civil Engineering	5	A

COURSE OUTCOMES:

At the end of the course, the student will be able to:

SNO	Course Outcome Statement
CO1	Understand the principles of fluid statics, kinematics and dynamics K2&K3
CO2	Apply the laws of fluid statics and concepts of buoyancy K2&K3
CO3	Understand the fundamentals of fluid kinematics and differentiate types of fluid flows K2&K3
CO4	Apply the Principle of conservation of energy for flow measurement. K2&K3
CO5	Analyse the losses in pipes and discharge through pipe network. K2&K3

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1:Understand the principles of fluid statics, kinematics and dynamics K2&K3	UNIT – I				
		1.1	Basic concepts and definitions: Distinction between a fluid and a solid; Density, Specific weight, Specific gravity	T1, T2, R1	4	Chalk& Talk& Tutorial
		1.2	Kinematic and dynamic viscosity; Variation of viscosity with temperature, Newton law of viscosity	T1, T2, R1	5	Chalk& Talk & Tutorial
		1.3	Vapor pressure, Boiling point, Surface tension, Capillarity, Bulk modulus of elasticity, Compressibility	T1, T2, R1	4	Chalk& Talk & Tutorial
2		UNIT – II				
		2.1	Fluid statics: Fluid Pressure: Pressure at a point, Pascal's law, pressure variation with temperature, density and altitude.	T1, T2, R1	4	Chalk& Talk& Tutorial
		2.2	Piezometer, U-Tube Manometer, Single Column Manometer, U Tube Differential Manometer. Pressure gauges,	T1, T2, R1	4	Chalk& Talk& Tutorial

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	CO 2:Apply the laws of fluid statics and concepts of buoyancy K2&K3	2.3	Hydrostatic pressure and force: horizontal, vertical and inclined surfaces.	T1, T2, R1	4	Chalk& Talk& Tutorial
		2.4	Buoyancy and stability of floating bodies Convective acceleration; Local acceleration;	T1, T2, R1	5	Chalk& Talk& Tutorial
3	**CO3:** Understand the fundamentals of fluid kinematics and differentiate types of fluid flows K2&K3	**UNIT – III**				
		3.1	Fluid kinematics: Classification of fluid flow : steady and unsteady flow; uniform and non-uniform flow; laminar and turbulent flow; rotational and irrotational flow; compressible and incompressible flow; ideal and real fluid flow;	T1, T2, R1	2	Chalk& Talk& Tutorial
		3.2	one, two and three dimensional flows; Stream line, path line, streak line and stream tube;	T1, T2, R1	3	Chalk& Talk& Tutorial
		3.3	Stream function, velocity potential function.	T1, T2, R1	3	Chalk& Talk& Tutorial
		3.4	One, two and three - Dimensional continuity equations in Cartesian coordinates	T1, T2, R1	3	Chalk& Talk& Tutorial
		3.5	Discharge through orifice meter; Measurement of velocity by Pitot tube.	T1, T2, R1	3	Chalk& Talk& Tutorial
4	**CO4:** Apply the Principle of conservation of energy for flow measurement. K2&K3	**UNIT – IV**				
		4.1	Fluid Dynamics: Surface and body forces; Equations of motion - Euler's equation; Bernoulli's equation – Derivation;	T1, T2, R1	4	Chalk& Talk& Tutorial
		4.2	Energy Principle; Practical applications of Bernoulli's equation : Venturimeter, orifice meter and Pitot tube;	T1, T2, R1	4	Chalk& Talk& Tutorial
		4.3	Momentum principle; Forces exerted by fluid flow on pipe bend; Vortex Flow – Free and Forced;	T1, T2, R1	3	Chalk& Talk& Tutorial
		4.4	Definitions of Reynolds Number, Froude Number, Mach Number, Weber Number and Euler Number	T1, T2, R1	3	Chalk& Talk& Tutorial
5	**CO5:** Analyse the	**UNIT – V**				
		5.1	Analysis Of Pipe Flow: Energy losses in pipelines; Darcy Weisbach equation;.	T1, T2, R1	4	Chalk& Talk& Tutorial

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	losses in pipes and discharge through pipe network. K2&K3	5.2	Minor losses in pipelines; Hydraulic Grade Line and Total Energy Line;	T1, T2, R1	4	Chalk& Talk& Tutorial
		5.3	Concept of equivalent length – Pipes in Parallel and Series.	T1, T2, R1	4	Chalk& Talk& Tutorial
				Total	72	

TEXT BOOKS

1. P. M. Modi and S. M. Seth, Hydraulics and Fluid Mechanics, Standard Book House 22nd, 2019.
2. K. Subrahmanya, Theory and Applications of Fluid Mechanics, Tata McGraw Hill, 2nd edition 2018

REFERENCE BOOKS

1. R. K. Bansal, A text of Fluid mechanics and hydraulic machines, Laxmi Publications (P) Ltd., New Delhi 11th edition, 2024.
2. N. Narayana Pillai, Principles of Fluid Mechanics and Fluid Machines, Universities Press Pvt Ltd, Hyderabad. 3rd Edition 2009.

PRINCIPAL HOD Faculty

Delivery Methods mentioned only Chalk & Talk, Tutorials

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Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week
R23CE2103	Surveying (R23)	II-I	Civil Engineering	5

COURSE OUTCOMES:

SNO	Course Outcome Statement
CO1	Apply the principle and methods of surveying and measuring of horizontal and vertical- distances and angles K3
CO2	Identify the source of errors and rectification methods K2
CO3	Apply surveying principles to determine areas and volumes K3
CO4	Setting out curves and using modern surveying equipment's K4
CO5	Apply the basics of Photogrammetry Surveying in field K3

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1:** Apply the principle and methods of surveying and measuring of horizontal and vertical-distances and angles K1&K3	**UNIT – I Introduction and Basic Concepts**				
		1.1	Introduction, Objectives, classification and principles of surveying	T1, T2	2	Chalk & Talk, PPT, & Tutorial
		1.2	Surveying accessories. Introduction to Compass, levelling and Plane table surveying.	T1, T2	2	
		1.3	Linear distances-Direct Methods-Chains and Tapes	T1, T2	3	
		1.4	Tapes, ranging, Tape corrections.	T1, T2	2	
		1.5	**Prismatic Compass-** Bearings, included angles, Local Attraction,	T1, T2	3	
		1.6	Magnetic Declination, and dip – W.C.B systems and Q.B. system of locating bearings.	T1, T2	3	
2	**CO2:** Identify the source of errors and rectification methods K2&K3	**UNIT – II Levelling and Contouring**				
		2.1	Types of levels, temporary and permanent adjustments	T1, T2, R2	4	Chalk & Talk, PPT Tutorial, Project Based Learning
		2.2	Methods of levelling, booking and Determination of levels,	T1, T2, R2	4	
		2.3	Effect of Curvature of Earth and Refraction.	T1, T2, R2	4	

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		2.4	**Contouring**- Characteristics and uses of Contours, methods of contour surveying.	T1, T2, R2	5	
		2.5	**Areas** - Determination of areas consisting of irregular boundary and regular boundary	T1, T2, R2	4	
		2.6	. Volumes -Determination of volume of earth work in cutting and embankments for level section, capacityof reservoirs.	T1, T2, R2	4	
3	**CO3:** Apply surveying principles to determine areas and volumes. K2&K3	**UNIT – III Theodolite Surveying and Traversing**				
		3.1	Types of Theodolites, temporary adjustments,	T1, T2, R2	4	Chalk & Talk, PPT Tutorial, Web Resources, Model Demonstration.
		3.2	Measurement of horizontal angle by repetition method and reiteration method	T1, T2, R2	5	
		3.3	Measurement of vertical Angles.	T1, T2, R2	4	
		3.4	Methods of traversing, traverse computations and adjustments.	T1, T2, R2	4	
4	**CO4:** Setting out curves and using modern surveying equipment's. K3&K4	**UNIT – IV Curves and Tachometric Surveying:**				
		4.1	Types of curves and their necessity, elements of simple	T1, T2, R2	3	Chalk & Talk, Tutorial, Quiz,Demonstration with Instruments.
		4.2	Compound, reverse curves	T1, T2, R2	2	
		4.3	Principles of Tachometry, stadia and tangential methods of Tachometry	T1, T2, R2	2	
		4.4	Modern Surveying	T1, T2, R2	2	
		4.5	Principle and types of E.D.M. Instruments,	T1, T2, R2	3	
		4.6	Total station- advantages and Applications. Introduction to Global Positioning System.	T1, T2, R2	4	
5	**CO5:** Apply the basics of Photogrammetry Surveying in field K3	**UNIT – V Photogrammetry Surveying:**				
		5.1	Introduction, Basic concepts, perspective geometry of aerial photograph,	T1, T2, R2	4	Chalk & Talk, Tutorial, & PPT, Web Resources.
		5.2	Relief and tilt displacements, terrestrial Photogrammetry	T1, T2, R2	3	

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		5.3	Flight planning; Stereoscopy	T1, T2, R2	2	
		5.4	ground control extension for photographic mapping- aerial triangulation.	T1, T2, R2	3	
				Total	85	

Text Books:

T1 Surveying (Vol – 1, 2 & 3), by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi.

T2 Chandra A M, "Plane Surveying and higher surveying", New Age International Pvt. Ltd., Publishers, New Delhi.

T3 Duggal S K, "Surveying (Vol – 1 & 2), Tata McGraw Hill Publishing Co. Ltd. New Delhi.

Reference Books:

1 Arthur R Benton and Philip J Taety, Elements of Plane Surveying, McGraw Hill.

R2 Surveying and levelling by R. Subramanian, Oxford university press, New Delhi

R3 S.S. Bhavikatti- Structural Analysis II- Vikas Publication Houses (P) Ltd.

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LESSON PLAN (COMMON TO ALL BRANCHES)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC21MC	ENVIRONMENTAL STUDIES (R23)	II-I	CIVIL	2	

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
I	CO:1 Understand multi-disciplinary nature of environmental studies and Analyze the natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources.(K2)	**Unit-1. Multidisciplinary nature of Environmental Studies**				
		1.1	Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.	T1, T2, R1	1	Chalk& Talk
		1.2	Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems	T1, T2, R1	1	Chalk& Talk
		1.3	Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction	T1, T2, R1	2	Active learning & PPT
		1.4	Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems	T1	2	PPT
		1.5	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.	T1, T2, R1	1	Active learning & PPT
2	CO2: Explain the concepts of the ecosystem and its function in the environment. The	**Unit-2.** Ecosystems				
		2.1	Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in	T1, T2, R1		Active learning & PPT

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	need for protecting the producers and consumers in various ecosystems and their role in the food web. Explain the biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity. (K2)		the ecosystem – Ecological succession mining, dams and effects on forest and tribal people.			
		2.2	Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:	T1, T2, R3	2	PPT & Case Study
		2.3	a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem	T1, T2, R3	1	Chalk& Talk
		2.4	d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) Biodiversity and Its Conservation : Introduction and Definition: genetic, species and ecosystem diversity.	T1, T2, R3	1	Chalk& Talk
		2.5	Bio-geographical classification of India Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values	T1	1	Chalk& Talk
		2.6	Biodiversity at global, National and local levels – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts	T1, T2, R1	1	Chalk& Talk
3	CO3: Distinguish various attributes of the pollution, their impacts and measures to reduce or control the pollution along with waste management(K2)	**Unit-3.** Environmental Pollution:				
		3.1	Environmental Pollution: Definition, Cause, effects and control measures of: a. Air Pollution.	T1, T2, R1	1	Chalk& Talk
		3.2	Definition, Cause, effects and control measures of: b.Water pollution c.Soil pollution	T1, T2, R1	1	Chalk& Talk
		3.3	d.Marine pollution e.Noise pollution	T1, T2, R1	1	Active learning & PP

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		3.4	Solid Waste Management: Causes, effects and control measures of urban and industrial wastes	T1, T2, R1	1	PPT
		3.5	Role of an individual in prevention of pollution – Pollution case studies	T1, T2, R1	1	Tutorial
		3.6	Disaster management: floods, earthquake, cyclone and landslides.	T1, T2, R1	1	Tutorial & PPT
4	CO4: Understand the rainwater harvesting, watershed management, and ozone layer depletion and waste land reclamation. (K2))	**Unit-4.** Social Issues and the Environment:				
		4.1	Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershedmanagement	T1, T2, R3	2	Chalk& Talk, Industrial Visit
		4.2	Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies	T1, T2, R3	2	PPT
		4.3	Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act	T1, T2, R3	2	Chalk& Talk, Case Study
		4.4	Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.	T1, T2, R3	1	Tutorial, PPT
5	CO 5: Illustrate the causes of population explosion, value education and welfare programmes. (K3).	**Unit 5.** Human Population And The Environment:				
		5.1	Population growth, variation among nations. Population explosion	T1, T2, R3	1	PPT, Chalk& Talk
		5.2	Family Welfare Programmes. – Environment and human health	T1, T2, R3 T1	1	PPT Active learning & PPT
		5.3	Human Rights – Value Education – HIV/AIDS	T1, T2, R3	1	Case Study & PPT
		5.4	Women and Child Welfare	T1, T2, R1	1	Chalk&Talk
		5.5	Role of information Technology in Environment and human health – Case	T1, T2, R1	1	Chalk& Talk

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		studies.			
	5.6	Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.	T1, T2, R1	1	Chalk& Talk, Active Learning
			Total	**34**	

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Erach Bharucha,Textbook of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
T2	Palaniswamy, Environmental Studies, 2/e, Pearson education, 2014.
T3	S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.
T4	K.Raghavan Nambiar, "Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010. .

REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e,Cengage Publications, 2012.
R2	M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BSPublication, 2014.
R3	J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering,Prentice Hall of India Private limited, 1988.
R4	G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House,2018.
R5	Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineeringand Science, 1/e, Prentice Hall of India Private limited, 1991

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC21	NUMERICAL METHODS & STATISTICAL METHODS	II-I	CE	5	-

CO1: Evaluate the approximate roots of polynomial and transcendental equations by different algorithms. Apply Newton's forward and backward and Lagrange's formulae for equal and unequal intervals (K3).
CO2: Apply numerical integral techniques to different Engineering problems. Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations (K3).
CO3: Apply discrete and continuous probability distributions (K3).
CO4: Design the components of a classical hypothesis test (K6).
CO5: Infer the statistical inferential methods based on small and large sampling tests (K4).

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT – I: ITERATIVE METHODS			
1	**CO1**: Evaluate the approximate roots of polynomial and transcendental equations by different algorithms. Apply Newton's forward and backward and Lagrange's formulae for equal and unequal intervals (K3).	1.1	Introduction	T1, T2, R1	1	Chalk & Talk, PPT
		1.2	Solutions of algebraic and transcendental equations: Bisection method	T1, T2, R1	1	Chalk & Talk
		1.3	Secant method	T1, T2, R1	1	Chalk & Talk
		1.4	Method of false position	T1, T2, R1	1	Chalk & Talk, PPT
		1.5	Method of false position	T1, T2, R1	1	Chalk & Talk
		1.6	General Iteration method	T1, T2, R1	1	Chalk & Talk
		1.7	General Iteration method	T1, T2, R1, R2	1	Chalk & Talk, PPT
		1.8	Newton-Raphson method (Simultaneous Equations)	T1, T2, R1	1	Chalk & Talk PPT
		1.9	Newton-Raphson method (Simultaneous Equations)	T1, T2, R1	1	Chalk & Talk
		1.10	Interpolation: Newton's forward and backward formulae for interpolation with unequal intervals,	T1, T2, R1	1	Chalk & Talk
		1.11	Lagrange's interpolation formula.	T1, T2, R1, R2	1	Tutorials
		1.12	Lagrange's interpolation formula.	T1, T2, R3	1	Chalk & Talk
			ASSIGNMENT-I EXAMINATION			
			UNIT – II: NUMERICAL INTEGRATION & SOLUTIONS OF O.D.E.			
	CO2: Apply	2.1	Trapezoidal rule, Simpson's 1/3rd and	T1, T2, R1	1	Chalk & Talk,

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2	numerical integral techniques to different Engineering problems. Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations (K3).		3/8th rule			PPT
		2.2	Trapezoidal rule, Simpson's 1/3rd and 3/8th rule	T1, T2, R1	1	Chalk & Talk
		2.3	Solution of initial value problems by Taylor's series	T1, T2, R1	1	Chalk & Talk
		2.4	Solution of initial value problems by Taylor's series	T1, T2, R1	1	Chalk & Talk
		2.5	Picard's method of successive approximations	T1, T2, R1	1	Chalk & Talk
		2.6	Picard's method of successive approximations	T1, T2,R1	1	PPT
		2.7	Euler's method	T1, T2, R1, R2	1	Chalk & Talk
		2.8	Euler's method	T1, T2, R1. R3	1	Chalk & Talk, PPT
		2.9	Runge - Kutta method (second and fourth order)	T1, T2, R1, R2	1	Chalk & Talk
		2.10	Runge - Kutta method (second and fourth order)	T1, T2, R1	1	Chalk & Talk Students Seminars
		2.11	Milne's Predictor and Corrector Method	T1, T2, R1, R3	1	Chalk & Talk, Tutorials
		2.12	Milne's Predictor and Corrector Method	T1, T2, R1	1	Chalk & Talk
			MID-I EXAMINATION			
3	**CO3:** Apply discrete and continuous probability distributions (K3).		**UNIT – III: PROBABILITY AND DISTRIBUTIONS**			
		3.1	Introduction of probability	T1, T2, R1, R3	1	Chalk & Talk, PPT.
		3.2	Baye's theorem	T1, T2, R1, R2	1	Chalk & Talk
		3.3	Random variables	T1, T2, R1, R2	1	PPT.
		3.4	Discrete and Continuous random variables	T1, T2, R1, R3	1	Chalk & Talk
		3.5	Distribution functions: Probability mass function	T1, T2, R1	1	Chalk & Talk
		3.6	Probability density function and Cumulative distribution functions	T1, T2, R1, R2	1	Chalk & Talk
		3.7	Mathematical Expectation and Variance	T1, T2, R1	1	Chalk & Talk
		3.8	Binomial distribution	T1, T2, R1	1	Chalk & Talk PPT
		3.9	Poisson distribution	T1, T2, R1, R3	1	Chalk & Talk
		3.10	Uniform distribution	T1, T2, R1, R3	1	Chalk & Talk PPT
		3.11	Normal distribution	T1, T2, R1, R2	1	Chalk & Talk
		3.12	Normal distribution	T1, T2, R1, R2	1	Chalk & Talk Tutorials
4	**CO4:** Design the components of a classical hypothesis test (K6).		**UNIT–IV: SAMPLING THEORY**			
		4.1	Introduction	T1, T2, R1	1	Chalk & Talk, PPT.
		4.2	Population and Samples	T1, T2, R1	1	Chalk & Talk
		4.3	Sampling distribution of Means and	T1, T2, R1	1	Chalk & Talk

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			Variance (definition only)			Students Seminars
		4.4	Sampling distribution of Means and Variance (definition only)	T1, T2, R1, R4	1	Chalk & Talk, Tutorials
		4.5	Point and Interval estimations	T1, T2, R1	1	Chalk & Talk, Tutorials
		4.6	Point and Interval estimations	T1, T2, R1, R5	1	Chalk & Talk
		4.7	Maximum error of estimate	T1, T2, R1, R2	1	Chalk & Talk
		4.8	Central limit theorem (without proof)	T1, T2, R1, R5	1	Chalk & Talk PPT
		4.9	Central limit theorem (without proof)	T1, T2, R1, R2	1	Chalk & Talk
		4.10	Estimation using t- test	T1, T2, R1, R2	1	Chalk & Talk
		4.11	Estimation using t- test	T1, T2, R1, R2	1	Chalk & Talk
		4.12	Estimation using t- test	T1, T2,R1, R3	1	Chalk & Talk PPT
	ASSIGNMENT-II EXAMINATION					
			UNIT – V: TESTS OF HYPOTHESIS			
5	**CO5:** Infer the statistical inferential methods based on small and large sampling tests (K4).	5.1	Introduction of Hypothesis	T1, T2, R1	1	Chalk & Talk PPT
		5.2	Null and Alternative Hypothesis	T1, T2, R1	1	Chalk & Talk, Tutorials
		5.3	Type I and Type II errors	T1, T2, R1	1	Chalk & Talk
		5.4	Level of significance	T1, T2, R1	1	Chalk & Talk
		5.5	One tail and two-tail tests	T1, T2, R1	1	Chalk & Talk
		5.6	Test of significance for large samples and Small Samples: Single and difference means	T1, T2,R1, R3	1	Chalk & Talk PPT
		5.7	Test of significance for large samples and Small Samples: Single and difference means	T1, T2,R1, R3	1	Chalk & Talk
		5.8	Single and two proportions	T1, T2,R1, R4	1	Chalk & Talk
		5.9	Student's t- test	T1, T2,R1, R2	1	Chalk & Talk
		5.10	F-test	T1, T2,R1, R2	1	Chalk & Talk PPT
		5.11	chi-square test	T1, T2,R1, R4	1	Chalk & Talk
		5.12	chi-square test	T1, T2,R1, R4	1	Chalk & Talk
			MID-II EXAMINATION			
						TOTAL:60

Text Books:

1. B. S. Grewal, Higher Engineering Mathematics, 44th Edition, Khanna Publishers.
2. Miller and Freund's, Probability and Statistics for Engineers, 7/e, Pearson, 2008.

Refrences:

1. Steven C. Chapra, Applied Numerical Methods with MATLAB for Engineering and Science,Tata Mc. Graw Hill Education.
2. M.K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Publications.

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3. Lawrence Turyn,Advanced Engineering Mathematics, CRC Press.
4. S. C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, 11/e, Sultan Chand & Sons Publications, 2012.
5. Shron L. Myers, Keying Ye, Ronald E Walpole, Probability and Statistics Engineers and the Scientists,8th Edition, Pearson 2007.

WEB SOURCE REFERENCES:

1	https://nptel.ac.in/courses/111107056/module2/lecture6/lecture6.pdf
2	https://nptel.ac.in/courses/122101003/downloads/Lecture-27.pdf https://nptel.ac.in/courses/115103036/module6/lec39.pdf https://nptel.ac.in/courses/111107056/module6/lecture5/lecture5.pdf https://nptel.ac.in/courses/115103036/module6/lec38.pdf
3	https://nptel.ac.in/downloads/111104032/ https://nptel.ac.in/courses/111104032/module5/lecture20.pdf
4	https://archive.org/details/NPTEL-Math-Probability_and_Statistics
5	https://onlinecourses.nptel.ac.in/noc22_ma81/preview

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2102	UHV (R23)	II-I	CSE	3	A

COURSE OUTCOMES:

- Define the terms like Natural Acceptance, Happiness and Prosperity (L1, L2)
- Identify one's self, and one's surroundings (family, society nature) (L1, L2)
- Apply what they have learnt to their own self in different day-to-day settings in real life (L3)
- Relate human values with human relationship and human society. (L4)
- Justify the need for universal human values and harmonious existence (L5)
- Develop as socially and ecologically responsible engineers (L3, L6)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Define the terms like Natural Acceptance, Happiness and Prosperity(L1,L2)		**UNIT-1 – Introduction to Value Education**			
		1.1	Introduction to Value Education	T1,R2	1	Chalk & Talk
		1.2	RightUnderstanding,Relationship and Physical Facility (Holistic Development and the Role of Education)	T1,R2	2	Chalk & Talk,PPT
		1.3	Understanding Value Education	T1,R2	1	Chalk & Talk
		1.4	Practice Session PS1 Sharing about Oneself	T1,R2	1	Tutorial
		1.5	Self-expolartion as the process for value education	T1,R2	1	Chalk & Talk,PPT
		1.6	Continuous Happiness and Prosperity – the Basic Human Aspirations	T1,R2	2	Chalk & Talk,PPT
		1.7	Practice Session PS2 Exploring Human Consciousness	T1,R2	1	Tutorial
		1.8	Happiness and Prosperity – Current Scenario	T1,R2	1	Chalk & Talk,PPT
		1.9	Method to Fulfill the Basic Human Aspirations	T1,R2	1	Web Resourses
		1.10	Practice Session PS3 Exploring Natural Acceptance	T1,R2	1	Tutorial
2	CO2: Identify one's self & one's surroundings (family, society nature)(L1,L2)		**UNIT-2 -** Harmony in the Human Being			
		2.1	Harmony in the Human Being	T1,R2	1	Chalk & Talk,PPT
		2.2	Understanding Human being as the Co-existence of the self and the body.	T1,R2	2	Chalk & Talk
		2.3	Distinguishing between the Needs of the self and the body	T1,R2	1	Chalk & Talk,PPT
		2.4	Practice Session PS4 Exploring the difference of Needs of self and body.	T1,R2	1	Tutorial
		2.5	The body as an Instrument of the self	T1,R2	1	Chalk & Talk,PPT

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		2.6	Understanding Harmony in the self	T1,R2	1	Chalk & Talk,PPT
		2.7	Practice Session PS5 Exploring Sources of Imagination in the self	T1,R2	1	Tutorial
		2.8	Harmony of the self with the body	T1,R2	1	Web Resourses
		2.9	Programme to ensure self-regulation and Health	T1,R2	1	Chalk & Talk,PPT
		2.10	Practice Session PS6 Exploring Harmony of self with the body	T1,R2	1	Tutorial
3	CO3: Apply what they have learnt to their own self in different way-to-day settings in real life(L3)		**UNIT-3** - Harmony in the Family and Society			
		3.1	Harmony in the Family and Society	T2,R2	1	Chalk & Talk
		3.2	Harmony in the Family – the Basic Unit of Human Interaction	T2,R2	1	Chalk & Talk,PPT
		3.3	'Trust' – the Foundational Value in Relationship	T2,R2	1	Chalk & Talk,PPT
		3.4	Practice Session PS7 Exploring the Feeling of Trust	T2,R2	1	Tutorial
		3.5	'Respect' – as the Right Evaluation	T2,R2	1	Web Resourses
			MID I EXAMINATION			
		3.6	Practice Session PS8 Exploring the Feeling of Respect	T2,R2	1	Chalk & Talk,PPT
		3.7	Other Feelings, Justice in Human-to-Human Relationship	T2,R2	1	Chalk & Talk,PPT
		3.8	Understanding Harmony in the Society	T2,R2	1	Chalk & Talk,PPT
		3.9	Vision for the Universal Human Order	T2,R2	1	Web Resourses
		3.10	Practice Session PS9 Exploring Systems to fulfil Human Goal	T2,R2	1	Tutorial
4	CO4: Relate human values with human relationship & human society(L4)		**UNIT-4** - Harmony in the Nature/Existence			
		4.1	Harmony in the Nature/Existence	T2,R2	1	Chalk & Talk
		4.2	Understanding Harmony in the Nature	T2,R2	1	Chalk & Talk,PPT
		4.3	Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature	T2,R2	2	Web Resourses
		4.4	Practice Session PS10 Exploring the Four Orders of Nature	T2,R2	1	Tutorial
		4.5	Realizing Existence as Co-existence at All Levels	T2,R2	1	Chalk & Talk,PPT
		4.6	The Holistic Perception of Harmony in Existence	T2,R2	1	Chalk & Talk,PPT
		4.7	Practice Session PS11 Exploring Co-existence in Existence.	T2,R2	1	Tutorial
5	CO5: Justify the need for universal human values & harmonious existence(L5) CO6: Develop as socially & ecologically responsible engineers(L3,L6)		**UNIT-5** - Implications of the Holistic Understanding – a Look at Professional Ethics			
		5.1	Implications of the Holistic Understanding – a Look at Professional Ethics	T2,R2	1	Chalk & Talk,PPT
		5.2	Natural Acceptance of Human Values	T2,R2	1	Chalk & Talk
		5.3	Definitiveness of (Ethical) Human Conduct	T2,R2	1	Chalk & Talk,PPT
		5.4	Practice Session PS12 Exploring Ethical Human Conduct	T2,R2	1	Tutorial
		5.5	A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order	T2,R2	1	Chalk & Talk,PPT
		5.6	Competence in Professional Ethics	T2,R2	1	Web Resourses

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		5.7	Practice Session PS13 Exploring Humanistic Models in Education	T2,R2	1	Tutorial
		5.8	Holistic Technologies, Production Systems and Management Models-Typical Case Studies	T2,R2	2	Chalk & Talk,PPT
		5.9	Strategies for Transition towards Value-based Life and Profession	T2,R2	1	Web Resourses
		5.10	Practice Session PS14 Exploring Steps of Transition towards Universal Human Order	T2,R2	1	Tutorial
				Total	53	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Textbook and Teachers Manual

a. The Textbook

R R Gaur, R Asthana, G P Bagaria, *A Foundation Course in Human Values and Professional Ethics*, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1

b. The Teacher's Manual

R R Gaur, R Asthana, G P Bagaria,*Teachers' Manual for A Foundation Course in Human Values and Professional Ethics*, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

Reference Books

1. *JeevanVidya: EkParichaya*, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 1999.
2. *Human Values*, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. *The Story of Stuff* (Book).
4. *The Story of My Experiments with Truth* - by Mohandas Karamchand Gandhi
5. *Small is Beautiful* - E. F Schumacher.
6. *Slow is Beautiful* - Cecile Andrews
7. *Economy of Permanence* - J C Kumarappa
8. *Bharat Mein Angreji Raj* – PanditSunderlal
9. *Rediscovering India* - by Dharampal
10. *Hind Swaraj or Indian Home Rule* - by Mohandas K. Gandhi
11. *India Wins Freedom* - Maulana Abdul Kalam Azad
12. *Vivekananda* - Romain Rolland (English)
13. *Gandhi* - Romain Rolland (English)

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	CREDITS	Contact Periods/Week	Section
R23CC2201	MEFA (R23)	II-II	CE	2	4	A

COURSE OUTCOMES:

CO 1: Define the concepts related to Managerial Economics, financial accounting and management (L2)
CO 2: Understand the fundamentals of Economics viz., Demand, Production, cost, revenue and markets (L2)
CO 3: Apply the Concept of Production cost and revenues for effective Business decision (L3)
CO 4: Analyze how to invest their capital and maximize returns (L4)
CO 5: Evaluate the capital budgeting techniques. (L5)
CO 6: Develop the accounting statements and evaluate the financial performance of business entity (L5)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT-1 – Managerial Economics			
1	CO-1:Define the concepts related to Managerial Economics, financial accounting and management (L2)	1.1	Meaning & Nature of ME	T2, R2	2	Chalk & Talk
		1.2	significance, functions of ME	T2, R2	2	Chalk & Talk,PPT
		1.3	Advantages of ME	T2, R2	1	Chalk & Talk
		1.4	Demand-Concept, Function	T2, R2	1	Tutorial
		1.5	Law of Demand	T2, R2	1	Chalk & Talk,PPT
		1.6	Demand Elasticity- Types	T2, R2	2	Chalk & Talk,PPT
		1.7	Demand Measurement	T2, R2	1	Tutorial
		1.8	Demand Forecasting Factors governing Forecasting,	T2, R2	1	Chalk & Talk,PPT
		1.9	Demand Forecasting Methods	T2, R2	1	Web Resourses
		1.10	Managerial Economics and Financial Accounting and Management	T2, R2	1	Tutorial
			UNIT-2 - Production and Cost Analysis			
2	CO 2: Understand the fundamentals of Economics viz., Demand, Production,	2.1	Introduction – Nature	T2, R2	1	Chalk & Talk,PPT
		2.2	meaning, significance	T2, R2	1	Chalk & Talk
		2.3	functions and advantages	T2, R2	2	Chalk & Talk,PPT

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	cost, revenue and markets (L2)	2.4	Production Function	T2, R2	1	Tutorial
		2.5	Least- cost combination	T2, R2	1	Chalk & Talk,PPT
		2.6	Short run Production Function	T2, R2	1	Chalk & Talk,PPT
		2.7	long run Production Function	T2, R2	1	Tutorial
		2.8	Isoquants and Is costs	T2, R2	1	Web Resourses
		2.9	Cost & Break-Even Analysis	T2, R2	1	Chalk & Talk,PPT
		2.10	Cost concepts and Cost behaviour	T2, R2	1	Tutorial
		2.11	Break-Even Analysis (BEA)	T2, R2	1	Chalk & Talk,PPT
		2.12	Determination of Break-Even Point (Simple Problems).	T2, R2	3	Chalk & Talk,PPT
3	CO-3:Apply the Concept of Production cost and revenues for effective Business decision (L3)		**UNIT-3** - Business Organizations and Markets			
		3.1	Introduction – Forms of Business Organizations	T2,R2	1	Chalk & Talk
		3.2	Sole Proprietary	T2,R2	1	Chalk & Talk,PPT
		3.3	Partnership	T2,R2	1	Chalk & Talk,PPT
		3.4	Joint Stock Companies	T2,R2	1	Tutorial
		3.5	Public Sector Enterprises	T2,R2	1	Web Resourses
			MID I EXAMINATION			
		3.6	Types of Markets	T2,R2	1	Chalk & Talk,PPT
		3.7	Perfect and Imperfect Competition	T2,R2	1	Chalk & Talk,PPT
		3.8	Features of Perfect Competition Monopoly-	T2,R2	1	Chalk & Talk,PPT
		3.9	Monopolistic Competition	T2,R2	1	Web Resourses
		3.10	Oligopoly-Price-Output Determination	T2,R2	1	Tutorial
		3.11	Pricing Methods and Strategies	T2,R2	2	Chalk & Talk,PPT
4	CO 4: Analyze how to invest their capital and maximize returns (L4) CO-5: Evaluate the capital budgeting techniques. (L5)		**UNIT-4** - Capital Budgeting			
		4.1	Introduction – Nature,	T2,R2	1	Chalk & Talk
		4.2	meaning, significance	T2,R2	1	Chalk & Talk,PPT
		4.3	Types of Working Capital, Components	T2,R2	2	Web Resourses
		4.4	Sources of Short-term and Long-term Capital,	T2,R2	1	Tutorial
		4.5	Estimating Working capital	T2,R2	1	Chalk &

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	techniques. (L5)	4.4	Sources of Short-term and Long-term Capital,	T2,R2	1	Tutorial
		4.5	Estimating Working capital requirements.	T2,R2	1	Chalk & Talk,PPT
		4.6	Capital Budgeting– Features, Proposals	T2,R2	1	Chalk & Talk,PPT
		4.7	Methods and Evaluation	T2,R2	1	Tutorial
		4.8	Projects- Pay back Method, Accounting Rate of Return (ARR)	T2,R2	3	Chalk & Talk,PPT
		4.9	Net Present Value (NPV) Internal Rate Return (IRR) Method (sample problems)	T2,R2	3	Chalk & Talk,PPT
			UNIT-5 - Financial Accounting and Analysis			
5	CO 6: Develop the accounting statements and evaluate the financial performance of business entity (L5)	5.1	Introduction – Concepts and Conventions	T2,R2	2	Chalk & Talk,PPT
		5.2	Double-Entry Bookkeeping	T2,R2	1	Chalk & Talk
		5.3	Journal	T2,R2	3	Chalk & Talk,PPT
		5.4	Ledger	T2,R2	2	Tutorial
		5.5	Trial Balance	T2,R2	2	Chalk & Talk,PPT
		5.6	Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).	T2,R2	4	Web Resourses
		5.7	Introduction to Financial Analysis	T2,R2	1	Tutorial
		5.8	Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability.	T2,R2	4	Chalk & Talk,PPT
				Total	73	
	MID II EXAMINATION DURING SIXTEENTH WEEK					
	END EXAMINATIONS					

Textbooks:-

1. Varshney & Maheswari: Managerial Economics, Sultan Chand.

2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

Reference Books:-

1. Ahuja Hl Managerial economics Schand.

2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International.

3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi.

4. Domnick Salvatora: Managerial Economics in a Global Economy, Cengage.

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NEC	Narasaraopet Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CE2202	Engineering Geology (R23)	II-II	Civil Engineering	5	A

COURSE OUTCOMES:

SNO	Course Outcome Statement
CO1	To know the importance of Engineering Geology to the Civil Engineering
CO2	To enable the students understand what minerals and rocks are and their formation and identification.
CO3	To highlight significance/ importance/ role of Engineering Geology in construction of Civil Engineering structures.
CO4	To enable the student realize its importance and applications of Engineering Geology in Civil Engineering constructions
CO5	concepts of Groundwater and its geophysical methods

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT-I			
1	**CO1:** To know the weathering process and mass movement K2 & K3	1.1	Importance of geology from Civil Engineering point of view. Important branches of geology;	T1, R1	2	Chalk &Talk, NPTEL/MOOCS
		1.2	Weathering, erosion and denudations process on earth material and natural agencies,	T1, R1	2	Chalk &Talk, NPTEL/MOOCS
		1.3	Geological work of wind, river underground water and glaciers	T1, R1	2	Chalk &Talk, NPTEL/MOOCS
		1.4	Types of weathering, its effect over the properties of rocks,	T1, R1	2	Chalk &Talk, NPTEL/MOOCS
		1.5	Brief study of case histories of failure of some Civil Engineering constructions due to geological draw backs	T1, R1	2	Chalk &Talk, NPTEL/MOOCS
			ASSIGNMENT-I			
			UNIT-II			
		2.1	Definition of mineral, Importance of study of minerals, Different methods of study of minerals. Advantages of study of minerals by physical properties. Study of physical properties	T1, R1	2	Chalk &Talk, NPTEL/MOOCS

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4	**CO4:** Identify subsurface information and groundwater potential sites through geophysical investigations K2&K3	4.2	Precautions to be taken for building construction in seismic areas.	T1,T2	2	Chalk &Talk, NPTEL/MOOCS
		4.3	Landslides, their causes and effect; measures to be taken to prevent their occurrence.	T1,R1	2	Chalk &Talk, NPTEL/MOOCS
		4.4	Importance of Geophysical Studies: Principles of geophysical study by Gravity methods. Magnetic methods	T1, R1	2	Chalk &Talk, NPTEL/MOOCS
		4.5	Electrical resistivity methods. Seismic methods,	T1, R1	2	Chalk &Talk, NPTEL/MOOCS
		4.6	Radio metric methods and geothermal method.	T1, R1	2	Chalk &Talk, NPTEL/MOOCS
			ASSIGNMENT-II			
			UNIT-V			
5.	**CO5:** Apply geological principles for mitigation of natural hazards and select sites for dams and tunnels. K2&K3	5.1	Types of dams and bearing of Geology of site in their selection,	T1, R1	2	Chalk &Talk, NPTEL/MOOCS
		5.2	Geological Considerations in the selection of a dam site.			
		5.3	Geological factors influencing water Lightness and life of reservoirs –	T1, R1	2	Chalk &Talk, NPTEL/MOOCS
		5.4	Purposes of tunneling, Effects of Tunneling on the ground			
		5.5	Role of Geological Considerations (i.e. Lithological, structural and ground water) in tunneling over break and lining in tunnels.	T1, R1	2	Chalk &Talk, NPTEL/MOOCS
		5.6	Improvement of competence of sites by grouting etc.	T1,, R1	2	Chalk &Talk, NPTEL/MOOCS
				Total	60	
			2nd MID EXAMINATION			
			SEMESTER EXAMINATION			

T	BOOK TITLE/AUTHORS/PUBLISHER
T1	Engineering Geology by N. Chennakesavulu, McMillan, India Ltd. 2005
T2	Engineering Methods by D. Venkat Reddy; Vikas Publishers 2015.
T3	Engineering Geology by S K Duggal, H K Pandey Mc Graw Hill Education Pvt Ltd 2014

REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	F.G. Bell, Fundamental of Engineering B.S. Publications, 2005.
R2	Krynine & Judd, Principles of Engineering Geology & Geotechnics, CBS Publishers & Distribution
R3	Engineering Geology by Subinoy Gangopadhyay, Oxford university press.

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WEB SOURCE REFERENCES:

1	https://onlinecourses.nptel.ac.in/noc19_ce02/preview
2	https://www.journals.elsevier.com/engineering-geology
3	https://www.sciencedaily.com/terms/engineering_geology.htm
4	https://www.youtube.com/results?search_query=engineering+geology+in+civil+engineering
5	https://www.youtube.com/watch?v=k8h4FKBPYoY&list=PLdM-WZokR4tZoAqn1B6Py_cYYnQ78lQS3
6	https://www.youtube.com/watch?v=6k9mtTmvPjw&list=PLbFCE9PA9MyRW9YExs5-6xkJZyCdZ9IZ

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN (2024-2025)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week
R23CE2203	CONCRETE TECHNOLOGY (R23)	II-II	Civil Engineering	5

COURSE OUTCOMES:

CO1	Familiarise the basic ingredients of concrete and their role in the production of concrete and its behaviour in the field.
CO2	Test the fresh concrete properties and the hardened concrete properties. Understand the basic concepts of concrete. Design the concrete mix by BIS method.
CO3	Evaluate the ingredients of concrete through lab test results. realise the importance of quality of concrete
CO4	Understand the behaviour of concrete in various environments.
CO5	Familiarize the basic concepts of special concrete and their production and applications.

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
UNIT – I : CEMENTS , AGGREGATES:						
1.	**CO1:** Familiarise the basic ingredients of concrete and their role in the production of concrete and its behaviour in the field.	1.1	Portland cement, Chemical composition	T1,T2,R1	1	Chalk & Talk, PPT
		1.2	Hydration, Setting of cement, Fineness of cement, Structure of hydrate cement	T1,T2,R1	2	Chalk & Talk
		1.3	Test for physical properties , Different grades of cements	T1,T2,R1	2	Chalk & Talk, PPT
		1.4	Admixtures ,Mineral and chemical admixtures	T1,T2,R1	1	Chalk & Talk
		1.5	Accelerators, retarders, air entrainers, plasticizers, super plasticizers, fly ash and silica fume	T1,T2,R1	2	Chalk & Talk, NPTEL/MOOCS
		1.6	Classification of aggregate	T1,T2,R1	1	Chalk & Talk
		1.7	Particle shape & texture	T1,T2,R1	1	Chalk & Talk
		1.8	Bond, strength & other mechanical properties of aggregates	T1,T2,R3	1	Chalk & Talk

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		1.9	Specific gravity, Bulk density, porosity, adsorption & moisture content of aggregate	T1,T2,R3	2	Chalk & Talk, Students Seminars
		1.10	Bulking of sand, Deleterious substances , Soundness	T1,R2,R3	1	Chalk & Talk
		1.11	Alkali aggregate reaction ,Thermal properties	T1,R2,R3	1	Chalk & Talk
		1.12	Sieve analysis , Fineness modulus	T1,T2,R3	1	Chalk & Talk, Virtual Labs
		1.13	Grading curves , Grading of fine & coarse Aggregates	T1,R2,R3	2	Chalk & Talk
		1.14	Maximum aggregate size, Quality of mixing water	T1,R2,R3	2	Chalk & Talk
ASSIGNMENT-I						
UNIT – II : FRESH CONCRETE:						
2.	**CO2:** Test the fresh concrete properties and the hardened concrete properties. Understand the basic concepts of concrete. Design the concrete mix by BIS method.	2.1	Steps in Manufacture of Concrete	T1,T2,R3	1	Chalk & Talk, PPT
		2.2	proportion, mixing, placing, compaction, finishing	T1,R2,R3	2	Chalk & Talk, Model Demonstration
		2.3	curing – including various types in each stage	T1,R2,R3	1	Chalk & Talk
		2.4	Properties of fresh concrete-Workability	T1,R2,R3	1	Chalk & Talk, PPT
		2.5	Factors affecting workability	T1,R2,R3	1	Chalk & Talk
		2.6	Measurement of workability by different tests	T1,R2,R3	1	Chalk & Talk, Model Demonstration
		2.7	Setting times of concrete, Effect of time and temperature on workability	T1,R2,R3	2	Chalk & Talk, Quiz
		2.8	Segregation & bleeding ,	T1,T2,R3	1	Chalk & Talk, Virtual Labs
		2.9	Mixing and vibration of concrete,	T1,T2,R1	1	Chalk & Talk, PPT
MID EXAMINATIONS –I						
UNIT – III : HARDENED CONCRETE:						
		3.1	Water / Cement ratio	T1,T2,R3	1	Chalk & Talk

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3.	**CO3**: Evaluate the ingredients of concrete through lab test results. realise the importance of quality of concrete	3.2	Abram's Law, Gel/space ratio	T1,T2,R1	1	Chalk & Talk, Quiz
		3.3	Nature of strength of concrete ,Maturity concept	T1,R2,R3	1	Chalk & Talk
		3.4	Strength in tension & compression Factors affecting strength	T1,R2,R3	2	Chalk & Talk, Model Demonstration
		3.5	Relation between compression & tensile strength	T1,R2,R3	2	Chalk & Talk, PPT
		3.6	Curing, Testing of Hardened Concrete	T1,R2,R3	2	Chalk & Talk, Virtual Labs
		3.7	Compression test , Tension test	T1,R2,R3	2	Chalk & Talk, PPT
		3.8	Factors affecting strength	T1,R2,R3	1	Chalk & Talk
		3.9	Flexure test,Splitting test	T1,R2,R3	1	Chalk & Talk
		3.10	Non-destructive testing methods	T1,R2,R3	2	Chalk & Talk, Virtual Labs
		3.11	Codal provisions for NDT.	T1,R2,R3	1	Chalk & Talk
ASSIGNMENT-II						
UNIT – IV : ELASTICITY, CREEP & SHRINKAGE:						
4.	**CO4:** Understand the behaviour of concrete in various environments.	4.1	Modulus of elasticity	T1,T2,R1	1	Chalk & Talk
		4.2	Dynamic modulus of elasticity	T1,T2,R1	1	Chalk & Talk
		4.3	Poisson's ratio, Creep of concrete	T1,R2,R3	1	Chalk & Talk
		4.4	Factors influencing creep	T1,R2,R3	1	Chalk & Talk
		4.5	Relation between creep & time	T1,T2,R1	1	Chalk & Talk, PPT
		4.6	Nature of creep , Effects of creep	T1,T2,R1	1	Chalk & Talk
		4.7	Shrinkage ,types of shrinkage.	T1,R2,R3	1	Chalk & Talk
UNIT – V : MIX DESIGN AND SPECIAL CONCRETES:						
		5.1	Ready mixed concrete, Fibre reinforced concrete	T1,R2,R3	2	Chalk & Talk, PPT

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5	**CO5:** Familiarize the basic concepts of special concrete and their production and applications.	5.2	Different types of fibres	T1,T2,R1	1	Chalk & Talk
		5.3	Factors affecting properties of FRC, High performance concrete	T1,T2,R1	2	Chalk & Talk, PPT
		5.4	Self - consolidating concrete, Self-healing concrete.	T1,R2,R3	2	Chalk & Talk, Virtual Labs
		5.5	Factors in the choice of mix proportions	T1,T2,R1	1	Chalk & Talk
		5.6	Quality control of concrete	T1,R2,R3	1	Chalk & Talk, PPT
		5.7	Statistical methods- Acceptance Criteria	T1,R2,R3	1	Chalk & Talk, PPT
		5.8	Proportioning of concrete mixes by ACI method	T1,R2,R3	2	Chalk & Talk, Model Demonstration
		5.9	Proportioning of concrete mixes by IS Code method.	T1,R2,R3	2	Chalk & Talk, Model Demonstration
MID EXAMINATIONS –II						
				TOTAL	**69**	

TEXT BOOKS:

1. Concrete technology by M.S.Shetty, S.Chand & Company Pvt. Ltd., NewDelhi,2005
2. Properties of concrete by A.M.Neville, Pearson Education, 2007

REFERENCE:

1. Gambhir- —Concrete Technologyl- 5th edition- McGraw Hill Education (India) Private Limited- 2013
2. Mehta- P.K. - "Concrete: Microstructure- Properties and Materials " 4th edition- Tata McGraw Hill Education Private Limited- 2013
3. Santha Kumar A.R. - —Concrete Technologyl- Oxford University Press- New Delhi- 2009

E-LEARNING RESOURCES:

http://nptel.ac.in/courses/105102012/

http://www.cement.org/for-concrete-books-learning/concrete-

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN (2024-2025)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week
R23CE2204	STRUCTURAL ANALYSIS (R23)	II-II	Civil Engineering	5

COURSE OUTCOMES:

CO1	Apply energy theorems to analyze trusses
CO2	analyse indeterminate structures by using Castigliano's–II theorem
CO3	Analysis of fixed and continuous beams
CO4	Analyze continuous beams and portal frames by using slope-deflection method
CO5	Analyze continuous beams and portal frames by using Moment – distribution method

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
UNIT – I : ENERGY THEOREMS						
1.	**CO1:** Apply energy theorems to analyze trusses	1.1	Introduction	T1,T2,R1	1	Chalk & Talk,
		1.2	Strain energy in linear elastic system	T1,T2,R1	2	Chalk & Talk
		1.3	expression of strain energy due to axial load	T1,T2,R1	2	Chalk & Talk,
		1.4	expression of strain energy due to bending moment	T1,T2,R1	2	Chalk & Talk
		1.5	expression of strain energy due shear forces	T1,T2,R1	2	Chalk & Talk,
		1.6	Castigliano's first theorem	T1,T2,R1	3	Chalk & Talk
		1.7	Deflections of simple beams	T1,T2,R1	3	Chalk & Talk
		1.8	Deflections of pin jointed trusses.	T1,T2,R3	3	Chalk & Talk
ASSIGNMENT-I						
UNIT – II : ANALYSIS OF INDETERMINATE STRUCTURES						
		2.1	Indeterminate Structural Analysis	T1,T2,R3	1	Chalk & Talk
		2.2	Determination of static indeterminacies	T1,R2,R3	3	Chalk & Talk,
		2.3	Determination of kinematic indeterminacies	T1,R2,R3	3	Chalk & Talk

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2.	**CO2:** analyze indeterminate structures by using Castigliano's–II theorem	2.4	Solution of trusses with up to two degrees of internal indeterminacies	T1,R2,R3	3	Chalk & Talk
		2.5	Solution of trusses with up to two degrees of external indeterminacies	T1,R2,R3	2	Chalk & Talk
		2.6	Castigliano's–II theorem.	T1,R2,R3	2	Chalk & Talk,
MID EXAMINATIONS –I						
UNIT – III : FIXED BEAMS & CONTINUOUS BEAMS						
3.	**CO3:** Analysis of fixed and continuous beams	3.1	Introduction to statically indeterminate beams with uniformly distributed load	T1,T2,R1	3	Chalk & Talk
		3.2	Introduction to statically indeterminate beams with central point load	T1,T2,R1	3	Chalk & Talk,
		3.3	Introduction to statically indeterminate beams with eccentric point load	T1,R2,R3	3	Chalk & Talk
		3.4	Introduction to statically indeterminate beams with number of point loads	T1,R2,R3	3	Chalk & Talk
		3.5	Introduction to statically indeterminate beams with uniformly varying load	T1,R2,R3	3	Chalk & Talk
		3.6	Introduction to statically indeterminate beams with couple and combination of loads	T1,R2,R3	3	Chalk & Talk
		3.7	Shear force and Bending moment diagrams	T1,R2,R3	2	Chalk & Talk
		3.8	Deflection of fixed beams effect of sinking of support	T1,R2,R3	3	Chalk & Talk
		3.9	Deflection of fixed beams effect of rotation of a support.	T1,R2,R3	3	Chalk & Talk

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ASSIGNMENT-II						
UNIT – IV : SLOPE-DEFLECTION METHOD						
4.	**CO4:** Analyze continuous beams and portal frames by using slope-deflection method.	4.1	Introduction	T1,T2,R1	1	Chalk & Talk
		4.2	derivation of slope deflection equations	T1,T2,R1	2	Chalk & Talk
		4.3	application to continuous beams with settlement of supports	T1,R2,R3	3	Chalk & Talk
		4.4	application to continuous beams without settlement of supports	T1,R2,R3	3	Chalk & Talk
		4.5	Analysis of single bay portal frames without sway.	T1,T2,R1	3	Chalk & Talk
UNIT – V : MOMENT DISTRIBUTION METHOD						
5	**CO5:** Analyze continuous beams and portal frames by using Moment – distribution method.	5.1	Introduction to moment distribution method	T1,R2,R3	2	Chalk & Talk,
		5.2	Application to continuous beams with settlement of supports	T1,T2,R1	3	Chalk & Talk
		5.3	Application to continuous beams without settlement of supports	T1,T2,R1	3	Chalk & Talk,
		5.4	Analysis of single bay storey portal frames without sway.	T1,R2,R3	3	Chalk & Talk,
MID EXAMINATIONS –II						
TOTAL					81	

TEXT BOOKS:

1. Analysis of Structures – Vol-I&II by V.N.Vazirani&M.M.Ratwani, Khanna Publications,New Delhi.
2. Basic Structural Analysis by C.S.Reddy., Tata McGraw Hill Publishers. 3rd edition 2017.

REFERENCE:

1. Structural analysis by Aslam Kassimali Cengage publications 6th edition 2020.
2. Structural analysis Vol.I and II by Dr.R.Vaidyanathan and Dr.PPerumal– Laxmi publications. 3rd 2016
3. Introduction to structural analysis by B.D.Nautiyal, New Age international publishers, New Delhi.
4. Structural Analysis – D.S.Prakasarao -Univeristy press.

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CE2205	HYDRAULICS&HYDRAULIC MACHINERY	II-II	Civil Engineering	5	A

COURSE OUTCOMES:

At the end of the course, the student will be able to:

SNO	Course Outcome Statement
CO1	Understand the characteristics of laminar and turbulent flows.
CO2	Apply the knowledge of fluid mechanics to address the uniform flow problems in open channels.
CO3	Solve non-uniform flow problems and hydraulic jump phenomenon in open channel flows.
CO4	Evaluate the performance of impact of jets on plates and design Pelton wheel, Francis and Kaplan turbine
CO5	Understand the principles, losses and its efficiencies of centrifugal pumps

Unit No	Course Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Understand the characteristics of laminar and turbulent flows. K2&K3	UNIT – I				
		1.1	**Laminar & Turbulent flow in pipes:** Laminar Flow- Laminar flow through: circular pipes, annulus and parallel plates.	T1, R1	3	Chalk, Talk & Tutorial
		1.2	Stoke's law, Measurement of viscosity. Reynolds experiment, Transition from laminar to turbulent flow.	T1, R1	3	Chalk, Talk & Tutorial
		1.3	Resistance to flow of fluid in smooth and rough pipes-Moody's diagram	T1, R1	4	Chalk, Talk & Tutorial
		1.4	Introduction to boundary layer theory.	T1, R1	2	Chalk, Talk & Tutorial
2	CO2 : Apply the knowledge of fluid mechanics to address the uniform flow	UNIT – II				
		2.1	**Uniform flow in Open Channels:** Open Channel Flow - Comparison between open channel flow and pipe flow, geometrical parameters of a channel	T1, R1	3	Chalk, Talk & Tutorial
		2.2	Classification of open channels, classification of open channel flow, Velocity Distribution of channel section. Hydraulically efficient	T1, R1, R2		Tutorial

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	problems in open channels. K2&K3		channel sections: Rectangular, trapezoidal and triangular channels,			
		2.3	Energy and Momentum correction factors.	T1, T2, R1	3	Chalk, Talk & Tutorial
3	**CO3:** Solve non-uniform flow problems and hydraulic jump phenomenon in open channel flows. K2&K3	**UNIT – III**				
		3.1	**Non-Uniform flow in Open Channels:** Specific energy, critical flow, discharge curve, Specific force, Specific depth, and Critical depth.	T1, T2, R1	4	Chalk, Talk & Tutorial
		3.2	Measurement of Discharge and Velocity – Gradually Varied Flow- Dynamic Equation of Gradually Varied Flow.	T1, T2, R1	4	Chalk, Talk & Tutorial
		3.3	Hydraulic Jump and classification - Elements and characteristics- Energy dissipation.	T1, T2, R1	4	Chalk, Talk & Tutorial
4	**CO4:** Evaluate the performance of impact of jets on plates and design Pelton wheel, Francis and Kaplan turbine K2&K3	**UNIT – IV**				
		4.1	**Impact of Jets:** Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes - Velocity triangles at inlet and outlet - Work done and efficiency	T1, T2, R1	4	Chalk, Talk, Model demonstration Tutorial
		4.2	Hydraulic Turbines: Classification of turbines; pelton wheel and its design.	T1, T2, R1	5	Chalk, Talk, Model demonstration Tutorial
		4.3	Francis turbine and its design - efficiency - Draft tube: theory - characteristic curves of hydraulic turbines	T1, T2, R1	4	Chalk, Talk, Model demonstration Tutorial
		4.4	. Cavitation: causes and effects.	T1, T2,	2	Chalk, Talk, Model
5	**CO5:** Understand the principles, losses and its efficiencies of centrifugal pumps **K2&K3**	**UNIT – V**				
		5.1	**Pumps:** Working principles of a centrifugal pump, work done by impeller; heads, losses and efficiencies; minimum starting speed;	T1, T2, R1	4	Chalk, Talk, Model demonstration & Tutorial
		5.2	Priming; specific speed; limitation of suction lift, net positive suction head (NPSH); Performance and characteristic curves;	T1, T2, R1	4	Chalk, Talk, Model demonstration & Tutorial
		5.3	Cavitation effects; Multistage centrifugal pumps; troubles and remedies. Cavitation.	T1, T2, R1	4	Chalk, Talk, Model demonstration & Tutorial
				Total	62	

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TEXT BOOKS	
1.	P. M. Modi and S. M. Seth, Hydraulics and Fluid Mechanics, Standard Book House 22nd, 2019.
2.	K. Subrahmanya, Theory and Applications of Fluid Mechanics, Tata McGraw Hill, 2nd edition 2018
REFERENCE BOOKS	
1.	R. K. Bansal, A text of Fluid mechanics and hydraulic machines, Laxmi Publications (P) Ltd., New Delhi 11th edition, 2024.
2.	Fluid Mechanics by Frank M. White, Henry Xue, Tata McGraw Hill, 9th edition, 2022.
3.	C. S. P. Ojha, R. Berndtsson and P. N. Chadramouli, Fluid Mechanics and Machinery, Oxford University Press, 2010.
4.	Introduction to Fluid Mechanics & Fluid Machines by S K Som, Gautam Biswas, S Chakraborty 3rd edition 2011.

Signature of the faculty **Head of the department** **Principal**

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN (2024-2025)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week
R23CE22MC	: BUILDING MATERIAL & CONSTRUCTION	II-II	Civil Engineering	-

COURSE OUTCOMES:

CO1	Students will be able to get knowledge about various building materials.
CO2	Students can select required masonry work and bond for the construction.
CO3	Students will be able to get knowledge about Cemnet and Lime.
CO4	Students are able to know about different types of Roofs and different types of Floorings.
CO5	Students can select required Finishing & Painting for the construction.

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
UNIT – I : STONES, BRICKS AND TILES:						
1.	**CO1:** Students will be able to get knowledge about various building materials.	1.1	Properties of building stones.	T1,T2,R1	1	Chalk & Talk, PPT
		1.2	classification of stones	T1,T2,R1	1	Chalk & Talk
		1.3	Dressing of stone	T1,T2,R1	1	Chalk & Talk, PPT
		1.4	composition of good brick earth	T1,T2,R1	1	Chalk & Talk
		1.5	Characteristics of good tile – manufacturing methods,	T1,T2,R1	1	Chalk & Talk, NPTEL/MOOCS
		1.6	Uses of materials like Aluminium, Gypsum, Glass and Bituminous materials – their quality.	T1,T2,R1	1	Chalk & Talk
UNIT – II : MASONRY& WOOD:						
2.	**CO2:** Students can select required masonry work and bond for the construction.	2.1	Types of masonry	T1,T2,R3	1	Chalk & Talk, PPT
		2.2	English and Flemish bonds	T1,R2,R3	1	Chalk & Talk, Model Demonstration
		2.3	Rubble and Ashlar Masonry	T1,R2,R3	1	Chalk & Talk
		2.4	. Cavity and Partionwalls	T1,R2,R3	1	Chalk & Talk, PPT
		2.5	Structure – Properties- Seasoning	T1,R2,R3	1	Chalk & Talk

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			of timber- Classification of various types of woods used in buildings			
		2.6	Defects in timber. Alternative materials for wood – Galvanized Iron	T1,R2,R3	1	Chalk & Talk, Model Demonstration
		2.7	Fiver – Reinforced Plastics, Steel, Aluminium	T1,R2,R3	1	Chalk & Talk, Quiz
UNIT – III LIME AND CEMENT:						
3.	**CO3**: Students will be able to get knowledge about Cemnet and Lime.	3.1	Various ingredients of lime- constituents of lime stone classification of lime	T1,T2,R1	1	Chalk & Talk
		3.2	various methods of manufacture of lime.	T1,T2,R1	1	Chalk & Talk, Quiz
		3.3	Portland cement- Chemical Composition – Hydration, setting and fineness of cement. Various types of cement and their properties	T1,R2,R3	2	Chalk & Talk
		3.4	Various field and laboratory tests for Cement. Various ingredients of cement concrete	T1,R2,R3	1	Chalk & Talk, Model Demonstration
		3.5	importance – various tests for concrete.	T1,R2,R3	1	Chalk & Talk, PPT
UNIT – IV : BUILDING COMPONENTS:						
4.	**CO4:** Students are able to know about different types of Roofs and different types of Floorings.	4.1	Lintels, arches, vaults, stair cases – types. Different types of floors	T1,T2,R1	1	Chalk & Talk
		4.2	Concrete, Mosaic, Terrazzo floors, Pitched, flat roofs. Lean to roof	T1,T2,R1	1	Chalk & Talk
		4.3	Coupled Roofs. Trussed roofs – King and Queen post Trusses	T1,R2,R3	2	Chalk & Talk
		4.4	R.C.C Roofs, Madras Terrace and Pre-fabricated roofs	T1,R2,R3	1	Chalk & Talk
UNIT – V : FINISHINGS & PAINTS :						

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5	**CO5:**Students canselect required Finishing& Painting for the construction.	5.1	Damp Proofing and water proofing materials and uses	T1,R2,R3	1	Chalk & Talk, PPT
		5.2	Plastering Pointing, white washing and distempering.	T1,T2,R1	1	Chalk & Talk
		5.3	Constituents of paint – Types of paints	T1,T2,R1	1	Chalk & Talk, PPT
		5.4	Painting of new/old wood- Varnish	T1,R2,R3	1	Chalk & Talk, Virtual Labs
		5.5	Form Works and Scaffoldings.	T1,T2,R1	2	Chalk & Talk
				TOTAL	**30**	

TEXT BOOKS:

1. S.S. Bhavikatti, —*Building Materials"* , Vices publications House private ltd.
2. B.C. Punmia, Laxmi *"Building Materials"* Publications private ltd.

REFERENCE:

1. S.K.Duggal, *"Building Materials"* New Age International Publications
2. P.C.Verghese, *"Building Materials"* PHI learning (P) ltd.
3. M.L.Gambhir, *"Building Materials"*, Tata McGraw Hill Publishing Co. Ltd. New Delhi.
4. **E-LEARNING RESOURCES:**

http://nptel.ac.in/courses/105102012/

Signature of the faculty **Head of the department** **Principal**

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN: 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CE3101	DESIGN AND DRAWING OF CONCRETE STRUCTURES (R20)	III-I	Civil Engineering	6	A

COURSE OUTCOMES:

At the end of the course, the student will be able to:

SNO	Course Outcome Statement
CO1	Understand the fundamental behaviour of RCC structures and code provisions of IS 456:2000 and IS 875.
CO2	Analyse the different types of beams subjected to different loading conditions and understand the variation of moment of resistance (Understanding, Analysing)
CO3	Apply the IS code provisions for design of sections and determining the reinforcement detailing satisfying the given loading conditions (Applying, Analysing)
CO4	Design of slabs, columns and footings for given loading conditions (Designing)
CO5	Drawing the reinforcement detailing of beams, columns and footings and slabs for obtained data in design. (Analysing, drawing)

Unit No	Outcome		Topics/Activity	Ref Text book	Delivery Method	Total Periods
1	CO1: Understand the fundamental behaviour of RCC structures and code provisions of IS 456:2000 and IS 875. K3&K4		**UNIT – I INTRODUCTION TO DESIGN METHODS**			
		1.1	Introduction to loading standards: Dead, live, wind and earthquake loads	T3, R3	Chalk & Talk	2
		1.2	Elastic theory: design constants, modular ratio, neutral axis depth and moment of resistance for balanced, under-reinforced and over-reinforced sections	T3, R3	Chalk & Talk, Tutorial	3
		1.3	Design and analysis of singly reinforced and doubly reinforced beams.	T3, R3	Chalk & Talk, Industrial Visit	5
		1.4	**Limit state method:** Assumptions in limit state design. Stress and strain block parameters.	T2, R3	PPT, Quiz	2

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		UNIT – II DESIGN OF BEAMS				
2	**CO2:** Analyse the different types of beams subjected to different loading conditions and understand the variation of moment of resistance (Understanding, Analysing). K2, K3&K4	2.1	Design of singly and doubly reinforced beams.	T2, T3, R3	Chalk & Talk	4
		2.2	**Flanged sections:** Analysis and design of singly and doubly reinforced flanged sections	T2, T3, R3	Chalk & Talk, Tutorial	3
		2.3	Design problems on flanged sections	T2, T3, R3	Demonstration with models	4
		2.4	**Shear and Torsion:** Limit state design of section for Shear and torsion.	T2, T3, R3	PPT, NPTEL/ MOOCS	2
		2.5	Complete beam design both rectangular and flanged beams	T2, T3, R3	Chalk & Talk, PPT, Quiz	3
		UNIT – III DESIGN OF SLABS				
3	**CO3:** Apply the IS code provisions for design of sections and determining the reinforcement detailing satisfying the given loading conditions (Applying, Analysing) K3,K4&K5	3.1	Design of one way slab Simply supported slab	T2, T3, R3	Chalk & Talk, Student Seminars	5
		3.2	Design of cantilever slab	T2, T3, R3	PPT/NPTEL	3
		3.3	Design of continuous slab	T2, T3, R3	Project based learning	3
		3.4	Design of two way slab all corners are held down	T2, T3, R3	Tutorial	4
		3.5	Design of two way slab all corners are free to lift	T2, T3, R3	Chalk & Talk, Quiz	4
		UNIT – IV DESIGN OF COLUMNS				
4	**CO4:** Design of slabs, columns and footings for given loading conditions (Designing) K4	4.1	Different types of columns and Design of short and long columns	T2, T3, R3	Chalk & Talk, Student Seminars	2
		4.2	Design of Columns subjected to axial load	T2, T3, R3	PPT/NPTEL, Web Resources	5
		4.3	Design of Columns subjected to uni axial and bi axial bending	T2, T3, R3	Project based learning	4

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		4.4	Reinforcement detailing of columns.	T2, T3, R3	Tutorial, Quiz	2
5	CO5: Drawing the reinforcement detailing of beams, columns and footings and slabs for obtained data in design. (Analysing, drawing) K4	**UNIT – V DESIGN OF FOOTINGS**				
		5.1	Different types of footings and Design of isolated footings	T2, T3, R3	Chalk & Talk	2
		5.2	Design of square footing	T2, T3, R3	Project based learning	3
		5.3	Design of rectangular footing	T2, T3, R3	PPT, Web resources	3
		5.4	Reinforcement details in footings	T2, T3, R3	Tutorial, Quiz	3
					Total Periods =70	

Note: All designs from Unit II should be in limit state design. Following plates should be prepared by the students.

1. Reinforcement detailing of Rectangular beams, T-beams and L-beams.
2. Reinforcement detailing of columns and isolated footings.
3. Detailing of one-way and two-way slabs.
4. Reinforcement detailing of continuous slabs.

FINAL EXAMINATION PATTERN:

The end examination paper should consist of Part A and Part B. Part A consists of two questions in Design and Drawing out of which one question is to be answered. Part B should consist of five questions and design out of which three are to be answered. Weightage for Part – A is 40% and Part- B is 60%

TEXT BOOKS:	
1	Limit State Design, A. K. Jain.
2	Limit State Design of Reinforced concrete, B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, 2007, Laxmi Publications.

REFERENCE BOOKS:	
1	Reinforced concrete design, S.Unnikrishna Pillai & Devdas Menon, 3rd edition, Tata McGraw Hill, New Delhi.
2	N.C. Sinha and S.K Roy, "Fundamentals of Reinforced Concrete", 4th Edition, S. Chand publishers, 2002
3	N. Krishna Raju and R.N. Pranesh, "Reinforced Concrete Design", 8th Edition, New age International Publishers, New Delhi, 2004.
4	Fundamentals of Reinforced concrete design, M.L. Gambhir, 3rd edition, Printice Hall of India Private Ltd.
5	IS Codes: IS 456:2000, IS 875(Part I & II)

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CE3102(R20)	SOIL MECHANICS	III-I	Civil Engineering	6	A

COURSE OUTCOMES:

SNO	Course Outcome Statement
CO1	**Classify** -soil and their engineering properties (Understanding)
CO2	**Explain**-the importance of permeability, seepage and its effects (Understanding, Applying)
CO3	**Calculate** -the stresses in soils under external loads (Analyzing, Evaluating)
CO4	**Analysis**- settlement behavior of soils under compaction and consolidation (Analyzing, Evaluating)
CO5	**Explain**- the failure mechanism under the influence of different loading and drainage conditions (Understanding)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1: Classify** -soil and their engineering properties (Understanding) K1,K2	**UNIT – I INTRODUCTION AND INDEX PROPERTIES OF SOILS**				
		1.1	Soil formation– Soil structure and clay mineralogy	T1, T2 R3	15	Chalk & Talk, PPT, Web resources.
		1.2	Adsorbed water, Mass- Volume relationships	T3, R3		Chalk & Talk, PPT.
		1.3	Relative density. Grain size analysis– Sieve and Hydrometer methods	T1, T2 R3		Chalk & Talk, PPT.
		1.4	Consistency limits and indices– IS Classification of soils.	T1, T2 R3		Chalk & Talk, PPT.
2	**CO2: Explain**-the importance of permeability, seepage and its effects (Understanding, Applying) K2,K3	**UNIT – II PERMEABILITY**				
		2.1	Soil water – Capillary rise – Flow of water through soils – Darcy's Law	T1, T2 R3	14	Chalk & Talk, PPT, Model demonstration.
		2.2	Permeability – Factors affecting permeability, Capillary phenomenon in soils	T1, T2 R3		Chalk & Talk.
		2.3	Laboratory determination of coefficient of permeability – Permeability of layered systems	T1, T2 R3		Chalk & Talk, PPT, Model demonstration.
		2.4	Total, neutral and effective stresses	T1, T2		Chalk & Talk

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					R3		
		2.5	Quick sand condition		T1, T2 R3		Chalk & Talk, PPT, Model demonstration
3	**CO3: Calculate** -the stresses in soils under external loads (Analyzing, Evaluating) K3,K4	**UNIT – III SEEPAGE THROUGH SOILS & STRESS DISTRIBUTION IN SOILS**					
		3.1	Seepage through soils		T1, T2 R3	13	Chalk & Talk, PPT, Problem based learning.
		3.2	Flow nets: Construction, Characteristics and Uses.		T1, T2 R3		Chalk & Talk, PPT.
		3.3	Boussinesq's and Westergaard's theories for point loads and areas of different shapes		T1, T2 R3		Chalk & Talk, PPT.
		3.4	Newmark's influence chart.		T1, T2 R3		Chalk & Talk, PPT, Flipped learning.
4	**CO4: Analysis**- settlement behavior of soils under consolidation (Analyzing, Evaluating) K4,K5	**UNIT – IV CONSOLIDATION**					
		4.1	Stress history of clay; Compressibility of soils		T1, T2 R3	19	Chalk & Talk, PPT, Quiz, NPTEL.
		4.2	Terzaghi's one dimensional consolidation theory		T1, T2 R3		Chalk & Talk, PPT, Quiz, NPTEL.
		4.3	Consolidation test, pre-consolidation pressure		T1, T2 R3		Chalk & Talk, PPT, Quiz, NPTEL.
		4.4	e - p and e-log p curves		T1, T2 R3		Chalk & Talk, PPT, Quiz, NPTEL.
		4.5	Total settlement		T1, T2 R3		Chalk & Talk, PPT, Quiz, NPTEL.
5	**CO5: Analysis**- settlement behavior of soils under compaction (Analyzing, Evaluating) K4,K5	**UNIT – V COMPACTION**					
		5.1	Mechanism of compaction		T1, T2 R3	14	Chalk & Talk. Web Resources.
		5.2	Factors affecting compaction		T1, T2 R3		Chalk & Talk. Web Resources.
		5.3	Effects of compaction on soil properties		T1, T2, R3		Chalk & Talk. Web Resources.

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		5.4	Field compaction Equipment	T1, T2, R3		Chalk & Talk. Web Resources.
		5.5	Compaction control.	T1, T2, R3		Chalk & Talk. Web Resources.
				Total	75	

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Arora. K.R., -Soil Mechanics and Foundation Engineering, 5th Edition, Standard Publishers and Distributors, 2001.
T2	Gopal Ranjan, Rao A.S.R., —Basic and Applied Soil Mechanicsl, 2nd Edition, New Age Intl. (P) Ltd., 2005.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Das. B.M., —Principles of Geotechnical Engineeringl, 7th Edition, Cengage Learning, 2010.
R2	Murthy V. N. S., —Textbook of Soil Mechanics and Foundation Engineeringl, 1st Edition,
R3	Venkataramiah. C., —Geotechnical Engineeringl, 3rd Edition. New Age International Pvt. Ltd, 2008.

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DEPARTMENT OF CIVIL ENGINEERING

LESSON PLAN: 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CE3103	**HIGHWAY ENGINEERING**	III-I	Civil Engineering	6	A & B

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Plan road network by linking of various surveys and to evaluate and develop master plans for a better road network .K2&K3
CO2	Select appropriate materials for use in different road layers for different types of pavements. K2&K3
CO3	Perform road pavement design and analysis by various IRC and other methods . K2&K3
CO4	Interpret geometric design fundamentals, in relation to safety and driver comfort, focusing on horizontal and vertical alignment . K2&K3
CO5	Ability to develop traffic signals and help to properly regulate the traffic and better use of road network. K2&K3

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
UNIT – I : Highway Development and Planning:						
1	**CO1**: : Plan road network by linking of various surveys and to evaluate and develop master plans for a better road network K2&K3	1.1	Highway development in India	T1, T2, R1	1	Chalk ,Talk & Web resources
		1.2	Road Network Patterns	T1, T2, R4	1	PPT, Active Learning & NPTEL
		1.3	Planning Surveys	T1, T2, R1	1	PPT, Active Learning
		1.4	Preparation of plans	T1, T2, R2	2	case study
		1.5	Master plan	T1, T2, R1	2	Chalk ,Talk & Model Demonstration
		1.6	20 year Road Development Plans	T1, T2, R4	2	PPT, Active Learning
		1.7	Highway Alignment-	T1, T2, R1	1	Chalk , Talk & Virtual labs
		1.8	Factors affecting Alignment	T1, T2, R3	1	Chalk ,Talk & Web resources
		1.9	Engineering Surveys	T1, T2, R1	1	PPT, Active Learning & NPTEL

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2	**CO2:** Select appropriate materials for use in different road layers for different types of pavements K2&K3.	**UNIT – II : Highway Geometric Design and Materials:**				
		2.1	Importance of geometric design-	T1, T2, R3	1	Chalk , Talk & Industrial visit
		2.2	Pavement surface characteristics	T1, T2, R3	1	PPT, Active Learning & Student seminars
		2.3	camber- carriageway- Krebs- road margins- formation- right of way	T1, T2, R5	2	PPT, Active Learning & Quiz
		2.4	Sight distance- stopping sight distance	T1, T2, R3	2	case study & Tutorial
		2.5	overtaking sight distance	T1, T2, R6	2	Chalk , Talk & PPT
		2.6	sight distance at intersections	T1, T2, R3	2	PPT, Active Learning
		2.7	Sub grade soils- CBR tests	T1, T2, R7	2	Chalk ,Talk & NPTEL
		2.8	Stone aggregates	T1, T2, R7	2	Chalk & Talk, PPT, Tutorial
		2.9	Bitumen materials	T1, T2, R3	2	Chalk & Talk, PPT, Tutorial
		3.0	Paving mixes	T1, T2, R3	2	Chalk & Talk, PPT, Tutorial
		MID EXAMINATIONS-I				
3	**CO3:** Perform road pavement design and analysis by various IRC and other methods K2&K3	**UNIT – III : Traffic Engineering:**				
		3.1	Basic Parameters of Traffic	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial
		3.2	Speed studies–spot speed and speed& delay studies -Parking Studies	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial
		3.3	Road Accidents	T1, T2, R1	2	PPT, Active Learning
		3.4	Causes and Preventive measures	T1, T2, R1	2	PPT, Active Learning
		3.5	Condition Diagram and Collision Diagrams	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial
		3.6	Road Traffic Signs- Road markings	T1, T2, R1	2	PPT, Active Learning
		3.7	Types of Intersections- At-Grade Intersections	T1, T2, R1	2	PPT, Active Learning
		3.8	Design of traffic signals.	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial
4		**UNIT – IV : Design of Highway Pavements:**				
		4.1	Design factors	T1, T2, R3	1	Chalk , Talk & PPT

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	CO4: Interpret geometric design fundamentals, in relation to safety and driver comfort focusing on horizontal and vertical alignment K2&K3.	4.2	Design of flexible pavements	T1, T2, R3	2	PPT, Active Learning & Student seminars
		4.3	IRC method, IRC recommendations	T1, T2, R3	2	PPT, Active Learning
		4.4	Design of Rigid pavements	T1, T2, R3	2	case study & Tutorial
		4.5	Westergaard's stress equation for wheel loads	T1, T2, R2	2	Chalk , Talk & PPT
		4.6	Temperatures stress	T1, T2, R2	2	PPT, Active Learning
		4.7	IRC recommendations	T1, T2, R3	2	Chalk ,Talk & Model demonstration
		4.8	Problems on Rigid Pavements	T1, T2, R3	2	Chalk ,Talk & Model demonstration
		4.9	Problems on Flexible Pavements	T1, T2, R3	2	Chalk & Talk, PPT, Tutorial
5	**CO 5:** Ability to develop traffic signals and help to properly regulate the traffic and better use of road network. K2&K3	**UNIT – V: Highway Construction, Maintenance and Drainage:**				
		5.1	Types of Highway Construction	T1, T2, R3	2	Chalk ,Talk & Tutorial
		5.2	Construction of water bound macadam roads;	T1, T2, R5	2	PPT, Quiz & Active Learning
		5.3	Bituminous pavements and cement concrete pavements	T1, T2, R5	2	PPT, Active Learning & Student seminars
		5.4	Construction of joints in cement concrete pavements;	T1, T2, R3	2	case study, web resources & Tutorial
		5.5	Maintenance of highways	T1, T2, R4	2	Chalk , Talk & Model demonstration
		5.6	Water bound macadam roads, bituminous pavements	T1, T2, R8	2	Chalk , Talk & Model demonstration
		5.7	Cement concrete pavements	T1, T2, R3	1	PPT, Active Learning & Student seminars
		5.8	Importance of highway drainage	T1, T2, R5	1	Chalk , Talk & PPT
		5.9	Requirements; Surface drainage; Sub-surface drainage	T1, T2, R3	2	PPT, Active Learning

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		6.0	Road construction in water logged areas and black cotton soils	T1, T2, R3	2	Chalk ,Talk & Model demonstration
MID EXAMINATIONS-II						
				Total	80	
END EXAMINATIONS						

TEXT BOOKS:

T	BOOK TITLE/AUTHORS/PUBLISHER
T1	Kadiyali L.R. Traffic Engineering and Transport Planning- Khanna Publishers- New Delhi- India- 1997
T2	Khanna- S.K. and C.E.G. Justo Highway Engineering- Nem Chand and Bros- Roorkee- India- 2001

REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Ministry of Road Transport and Highways. Specifications for Road and Bridge Works- Fourth Edition- Indian Roads Congress- New Delhi- India- 2001.
R2	RC Codes of Practices
R3	Principles of Transportation Engineering by Partha Chakroborty & Animesh Das , PHI Learning,2009.
R4	Principles of Transportation Engineering and highway Engineering by G.Venkatappa Rao,Tata Mc Graw-Hill,1995.

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CE3104	ADVANCED STRUCTURAL ANALYSIS	III-I	Civil Engineering	7	A

COURSE OUTCOMES:

At the end of this course; the student will be able to

CO 1: Analyze structures using various methods - Energy theorems, Moment Distribution method.

CO 2: Analyze continuous beams and portal frames using Kani's Method.

CO 3: Analyze Two Hinged and Three Hinged Arches.

CO 4: Apply approximate methods and determine the structural response of building frames subjected to gravity loads and lateral loads respectively.

CO 5: Analyze Cable and Suspension Bridge structures

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1:** Distinguish between the determinate and indeterminate structures K3&K4	**UNIT – I Propped Cantilever and Fixed beams :**				
		1.1	ENERGY THEOREMS: Introduction-Strain energy in linear elastic system	T3, R3	15	Chalk & Talk, Active Learning & Tutorial
		1.2	expression of strain energy due to axial load	T3, R3		
		1.3	Bending moment and shear forces - Castigliano's first theorem	T3, R3		
		1.4	Deflections of simple beams. MOMENT DISTRIBUTION METHOD: Degrees of freedom, Member flexural stiffness and carry over factor	T2, R3		
		1.5	Distribution factors, Analysis of Portal frames with Sway. Shear force and bending moment diagrams Elastic curve	T2, R3		
2	**CO2:** Identify the behavior of structures due to the expected loads, including the moving loads, acting on the structure. K3&K4	**UNIT – II** KANI'S METHOD				
		2.1	KANI'S METHOD: Analysis of continuous beams –	T2, T3, R3	15	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		2.2	including settlement of supports	T2, T3, R3		
		2.3	Shear force and bending moment diagrams	T2, T3, R3		
		2.4	single bay portal frames with and without side sway	T2, T3, R3		

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		2.5	Elastic curve	T2, T3, R3			
3	**CO3:** Estimate the bending moment and shear forces in beams for different fixity conditions K3&K4	**UNIT – III** TWO HINGED ARCHES , THREE HINGED ARCHES					
		3.1	Determination of horizontal thrust, bending moment, normal thrust and radial shear	T2, T3, R3	15		Chalk & Talk, Tutorial
		3.2	Rib shortening and temperature stresses	T2, T3, R3			
		3.3	Tied arches – Fixed arches – (No analytical question)	T2, T3, R3			
		3.4	THREE HINGED ARCHES: Elastic theory of arches	T2, T3, R3			
		3.5	Eddy's theorem – Determination of horizontal thrust	T2, T3, R3			
		3.6	bending moment, normal thrust and radial shea	T2, T3, R3			
		3.7	Effect of temperature. Hinges with supports at different levels	T2, T3, R3			
4	**CO4:** Analyze the continuous beams using various methods – moment distribution method, slope deflection method, energy theorems K3&K4	**UNIT – IV** GRAVITY LOAD ANALYSIS USING APPROXIMATE METHODS					
		4.1	Analysis of continuous beams and portal frames using Inflection Points	T2, T3, R3	15		Chalk & Talk, Tutorial, Industrial Visit, Demonstration with models.
		4.2	Analysis of building frames using Substitute Frame Method	T2, T3, R3			
		4.3	LATERAL LOAD ANALYSIS USING APPROXIMATE METHODS	T2, T3, R3			
		4.4	Application to building frames.	T2, T3, R3			
		4.5	(i) Portal Method . (ii) Cantilever Method.	T2, T3, R3			
5	**CO5:** Draw the influence line diagrams for various types of moving loads on beams/bridges K3&K4	**UNIT – V** CABLE STRUCTURES AND SUSPENSION BRIDGES					
		5.1	Introduction, characteristics of cable,	T2, T3, R3	15		Chalk & Talk, Tutorial, & Project based learning
		5.2	analysis of cables subjected to concentrated and uniformly distributed loads	T2, T3, R3			
		5.3	anchor cable, temperature stresses	T2, T3, R3			
		5.4	analysis of simple suspension bridge	T2, T3, R3			
		5.5	three hinged and two hinged stiffening girder suspension bridges.	T2, T3, R3			
				Total	75		

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Text Books:

T1 C.S. Reddy, Basic Structural Analysis, Tata McGraw-Hill

T2 T. S. Thandavamoorthy, Structural Analysis, Oxford University Press (India)

Reference Books:

R1 Indeterminate Structural Analysis, K U Muthu et. al., IK International Publishing house pvt. Ltd.

R2 Analysis of Structures- Vol. I and II, V. N. Vazirani and M. M. Ratwani, Khanna Publishers, New Delhi.

R3 Mechanics of Structures Vol – II by H.J.Shah and S.B.Junnarkar, Charotar Publishing House Pvt. Ltd.

R4 Structural Analysis by Devdas Menon, Narosa Publishing Housing Pvt. Ltd.

R5 Structural Analysis: A Matrix Approach, G.S.Pandit and S.P.Gupta, Mc Graw Hill Pvt. Ltd.

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DEPARTMENT OF CIVIL ENGINEERING

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC31OE01	Disaster Management (R20)	III-I	Civil Engineering	6	A

COURSE OUTCOMES:

SNO	Course Outcome Statement
CO1	Understanding Disasters, man-made Hazards and Vulnerabilities K2&K3
CO2	Understanding disaster management mechanism K2&K3
CO3	Understanding capacity building concepts K2&K3
CO4	Understanding coping Strategies K2&K3
CO5	Understanding planning of disaster managements K2&K3

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT-I			
I	CO1 Understanding Disasters, man-made Hazards and Vulnerabilities K2&K3	1.1	**Understanding Disaster:** Concept of Disaster - Different approaches- Concept of Risk - Hazards and Vulnerabilities:	T1	2	Chalk &Talk
		1.2	Levels of Disasters - Disaster Phenomena and Events (Global, national and regional);	T1	3	Chalk &Talk, PPTS
		1.3	Natural and man-made hazards; response time, frequency and forewarning levels of different hazards	T1	3	Chalk &Talk, Tutorials
		1.4	Characteristics and damage potential or natural hazards; hazard assessment - Dimensions of	T1	3	Chalk &Talk, Tutorials
		1.5	vulnerability factors; vulnerability assessment - Vulnerability and disaster risk - Vulnerabilities to flood and earthquake hazards	T1	3	Chalk &Talk
			UNIT-II			
	CO2. Understanding disaster	2.1	**Disaster Management Mechanism:** Concepts of risk management and	T1	2	Chalk &Talk,
		2.2	- crisis managements -		3	Chalk &Talk,

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	management mechanism K2&K3				2	
		2.3	Disaster Management Cycle - Response and Recovery	T1, R1	2	Chalk &Talk ,Case Study
		2.4	Development, Prevention, Mitigation	T1, R1	2	Chalk &Talk, NPTEL/MOOCS
		2.5	Preparedness - Planning for Relief	T1, R2	2	Chalk &Talk, NPTEL/MOOCS
			UNIT-III			
3.	CO 3 Understanding capacity building concepts K2&K3]	3.1	**Capacity Building:** Capacity Building: Concept	T', R3	2	Chalk &Talk ,tutorial
		3.2	Strengthening Capacity for Reducing Risk -	T1, R3	2	Chalk &Talk,
		3.3	Counter-Disaster Resources and their utility in Disaster Management	T1, R3	2	Chalk &Talk
		3.4	. Legislative Support at the state and national levels	T1, R3	2	Chalk &Talk
			1ST MID EXMINATION			
		3.5	Monitors- Usage, Dining-Philosophers solution using monitors	T1, R3	2	Chalk &Talk
		3.6	- Structural and Nonstructural Measures Capacity Assessment;	T1, R1	2	Chalk &Talk
			UNIT-IV			
4	CO 4. Understanding coping Strategies K2&K3	4.1	**Coping with Disaster:** Coping Strategies;	T1,R1	2	Chalk &Talk
		4.2	alternative adjustment processes -	T1,T2	2	Chalk &Talk, PPTS
		4.3	Thrashing- Cause of Thrashing, Working set model, Page fault frequency	T1,R1	2	Chalk &Talk
		4.4	Changing Concepts of disaster management -	T1, R1	2	Chalk &Talk, Seminar
		4.5	Industrial Safety Plan; Safety norms and survival kits	T1, R1	2	Chalk &Talk
		4.6	Mass media and disaster management	T1, R1	2	Chalk &Talk, Seminar
			UNIT-V			
5	CO 5. Understanding planning of disaster managements K2&K3	5.1	**Planning for disaster management:** Strategies for disaster management planning	T1, R1	2	Chalk &Talk
		5.2	Steps for formulating a disaster risk reduction plan	T1, R1	2	Chalk &Talk
		5.3	Disaster management Act and Policy in India	T1, R1	2	Chalk &Talk
		5.4	— Organizational structure for disaster management in India -	T1,, R1	2	Chalk &Talk
		5.5	Preparation of state and district disaster management plans.	T1, R1	2	Chalk &Talk, PPTS

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				Total	60	
			2nd MID EXAMINATION			
			SEMESTER EXAMINATION			

T	BOOK TITLE/AUTHORS/PUBLISHER
T1	Disaster Management – Global Challenges and Local Solutions'by Rajib shah & R Krishnamurthy (2009), Universities press.
T2	Disaster Science & Management 'by Tushar Bhattacharya, Tata McGraw Hill Education Pvt. Ltd., New Delhi.
T3	Disaster Management – Future Challenges and Opportunities'by Jagbir Singh (2007), I K International Publishing House Pvt. Ltd.

REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Disaster Management 'edited by H K Gupta (2003), Universities press.

WEB SOURCE REFERENCES:

1	https://disasterinfo.nlm.nih.gov/dimrc/floods.html
2	https://disasterinfo.nlm.nih.gov/dimrc/coping.html
3	https://disasterinfo.nlm.nih.gov/dimrc.html
4	https://disasterinfo.nlm.nih.gov/enviro/disasterrecovery.html
5	http://go.usa.gov/xRGrw
6	https://toxtown.nlm.nih.gov/text_version/locations.php?id=55

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DEPARTMENT OF CE
LESSON PLAN- A.Y 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC31MC01	PEHV (R20)	III/I	CE	2	A

COURSE OUTCOMES: Student is able to

CO1: Interpret the fundamentals of Human values. [K2]
CO2: Analyze the ethical issues and role of engineers in industry. [K4]
CO3: Develop the principles of harmony in value education. [K3]
CO4: List out the duties and rights of engineers. [K4]
CO5: Summarize the engineer's responsibilities towards safety and risk. [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Interpret the fundamentals of Human values. [K2]		**Unit-1. Human Values**			
		1.1	Ethics, Morals, Values, Integrity,	T1, R1	1	Chalk & Talk
		1.2	Work Ethics- Service Learning	T1, R1	1	Chalk & Talk
		1.3	Civic Virtue- Respect for Others- Living Peacefully	T1, R1	1	Chalk & Talk,PPT
		1.4	Caring- Sharing- Honesty- Courage- Value Time	T1,R1	1	Chalk & Talk
			Cooperation- Commitment – Empathy- Self-Confidence- Spirituality- Character.	T1,R1	1	Chalk & Talk
2	CO2: Analyze the ethical issues and role of engineers in industry. [K4]		**Unit-2. Engineering Ethics**			
		2.1	Professional Roles to Be Played By Engineer	T1, R1	1	Chalk & Talk
		2.2	Engineers Role As Managers,	T1, R1	1	Chalk & Talk,PPT
		2.3	Consultants And Leaders- Ethical Theories And Its Uses.	T1, R1	2	Chalk & Talk,PPT
3	CO3: Develop the principles of harmony in value education. [K3]		**Unit-3. Principles for Harmony**			
		3.1	Truthfulness – Customs and Traditions	T1, R1	1	Chalk & Talk
		3.2	Value Education – Human Dignity	T1, R1	1	Chalk & Talk
		3.3	Human Rights –Fundamental Duties	T1, R1	1	Chalk & Talk, Seminars
		3.4	Aspirations and Harmony (I, We & Nature) – Gender Bias – Emotional Intelligence	T1, R1	1	Chalk & Talk
		3.5	Salovey – Mayer Model – Emotional Competencies – Conscientiousness.	T1, R1	2	Chalk & Talk

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MID I EXAMINATION DURING EIGTH WEEK						
4	CO4: List out the duties and rights of engineers. [K4]	**Unit-4. Engineers' Duties and Rights**				
		4.1	Concept of Duty - Professional Duties – Collegiality	T2, R2	1	Chalk & Talk
		4.2	Techniques for Achieving Collegiality –Senses of Loyalty	T2, R2	1	Chalk & Talk
		4.3	Consensus and Controversy - Professional and Individual Rights	T2, R2	1	Chalk & Talk
		4.4	Confidential and Proprietary Information - Conflict of Interest- Ethical egoism	T2, R2	1	Chalk & Talk, Seminars
		4.5	Collective Bargaining – Confidentiality - Gifts and Bribes	T2, R2	1	Chalk & Talk
		4.6	Problem solving-Occupational Crimes	T2, R2	1	Chalk & Talk
		4.7	Industrial Espionage- Price Fixing- Whistle Blowing	T2, R2	1	Chalk & Talk,PPT
5	CO5: Summarise the engineer's responsibilities towards safety and risk. [K2].	**Unit 5. Engineers' Responsibilities towards Safety and Risk**				
		5.1	Concept of Safety - Safety and Risk	T2, R2	1	Chalk & Talk
		5.2	Types of Risks – Voluntary v/s Involuntary Risk	T2, R2	1	Chalk & Talk, Seminars
		5.3	Consequences - Risk Assessment – Accountability	T2, R2	1	Chalk & Talk
		5.4	Liability - Reversible Effects	T2, R2	1	Chalk & Talk
		5.5	Threshold Levels of Risk - Delayed v/s Immediate Risk	T2, R2	1	Chalk & Talk,PPT
		5.6	Safety and the Engineer	T2, R2	1	Chalk & Talk
		5.7	Designing for Safety – Risk-Benefit Analysis-Accidents.	T2, R2	1	Chalk & Talk,PPT
				Total	30	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1 "Professional Ethics and Morals by Prof. A.R.Arasri, Dharanikota Suyodhana- Maruthi Publications.

T2 Human Values & Professional Ethics by S. B. Gogate, Vikas Publishing House Pvt. Ltd., Noida.

Reference Books:

R1 "Engineering Ethics and Human Values" by M. Govindarajan, S. Natarajan and V.S. Senthil kumar- PHI Learning PVT. Ltd-2009

R2 Professional Ethics by R. Subramanian – Oxford Publications, New Delhi.

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC2OE01	**Remote Sensing & GIS (R20)**	III-II	Civil Engineering	6	A & B

COURSE OUTCOMES:

CO1 Be familiar with ground, air and satellite based sensor platforms. K1&K2
CO2 Interpret the aerial photographs and satellite imageries.K2&K3
CO3 Create and input spatial data for GIS application. K2&K3
CO4 Development of Vector and Raster data models K3 &K4
CO5 Apply GIS analysis to address geospatial problemsK3&K4

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
UNIT – I INTRODUCTION TO REMOTE SENSING						
1	Be familiar with ground, air and satellite based sensor platforms.	1.1	Basic concepts of remote sensing	T1,T2,R1	1	Chalk & Talk, PPT
		1.2	electromagnetic radiation, electromagnetic spectrum,	T1,T2,R1	2	Chalk & Talk, PPT
		1.3	interaction with atmosphere, energy interaction with the earth surfaces	T1,T3,R1	2	Chalk & Talk, PPT
		1.4	characteristics of remote sensing systems, types of resolutions - advantages & limitations	T1,T2,R1	3	Chalk & Talk, PPT
		1.5	**SENSORS AND PLATFORMS:** Introduction, types of sensors, airborne remote sensing, space borne remote sensing,	T1,T3,R1	2	Chalk & Talk, PPT
		1.6	image data characteristics, digital image data formats-band interleaved by pixel, band interleaved by line, band sequential	T1,T3,R1	2	Chalk & Talk, PPT

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		1.7	IRS, LANDSAT, SPOT & Recent satellite.	T1,T3,R1	2	Chalk & Talk, PPT
UNIT – II	**IMAGE ANALYSIS**					
2	Interpret the aerial photographs and satellite imageries	2.1	Introduction, elements of visual interpretations	T1,T1,R1	2	Chalk & Talk, PPT
		2.2	digital image processing- image pre- processing, image enhancement	T2,T3,R1	3	Chalk & Talk, PPT
		2.3	Image classification, supervised classification, unsupervised classification.	T1,T2,R2	3	Chalk & Talk, PPT
		2.4	Overlay function-vector overlay operations.	T2,T3,R1	3	Chalk & Talk, PPT
		2.5	Raster overlay operations	T1,T3,R1	3	Chalk & Talk, PPT
		2.6	Network analysis	T1,T2,R1	2	Chalk & Talk, PPT, Virtual Labs, Problem based Learning
UNIT – III	**GEOGRAPHIC INFORMATION SYSTEM**					
3	Create and input spatial data for GIS application	3.1	Basic Principles, Coordinate systems, GIS and Information systems	T1,T5,R1	2	Chalk & Talk, PPT, NPTEL
		3.2	Definitions – History of GIS	T1,T5,R2	2	Chalk & Talk, PPT, Web Resources
		3.3	Components of GIS – Hardware, Software, Data, People, Methods, Proprietary and open source Software	T1,T5,R2	2	Chalk & Talk, PPT
		3.4	Types of Data – Spatial, Attribute data	T1,T5,R1	2	Chalk & Talk, PPT, Web Resources
		3.5	Types of Attributes-Scales components,	T1,T5,R2	2	Chalk & Talk, PPT
		3.6	application areas of GIS.	T1,T5,R1	3	Chalk & Talk, PPT, Case Studies
		3.7	Map projections	T1,T5,R2	4	Chalk & Talk, PPT, Tutorials
UNIT – IV	**SPATIAL DATA MODELS**					

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4	Development of Vector and Raster data models.	4.1	Database Structures – Relational, Object Oriented – Entities – ER diagram	T1,T5,R2	3	Chalk & Talk, PPT, NPTEL, Problem based Learning
		4.2	Data models conceptual, logical and physical models	T1,T5,R2	2	Chalk & Talk, PPT, NPTEL, Model Demonstration
		4.3	Spatial data models – Raster Data Structures	T1,T5,R2	2	Chalk & Talk, PPT, QUIZ
		4.4	Raster Data Compression	T1,T5,R2	2	Chalk & Talk, PPT, NPTEL
		4.5	Vector Data Structures	T1,T5,R2	2	Chalk & Talk, PPT, NPTEL, Problem based Learning
		4.6	Raster vs Vector Models	T1,T5,R2	2	Chalk & Talk, PPT, NPTEL,
		4.7	TIN and GRID data models.	T1,T5,R2	2	Chalk & Talk, PPT, NPTEL Student Seminar, Project based Learning.
UNIT – V DATA INPUT AND TOPOLOGY						
V	Apply GIS analysis to address geospatial problems	5.1	Scanner – Raster Data Input	T1,T5,R2	1	Chalk & Talk, PPT, Model Demonstration
		5.2	Raster Data File Formats	T1,T5,R2	2	Chalk & Talk, PPT
		5.3	Georeferencing – Vector Data Input – Digitiser	T1,T5,R2	3	Chalk & Talk, PPT, Project Based Learning.
		5.4	Datum Projection and reprojection – Coordinate Transformation	T1,T5,R2	3	Chalk & Talk, PPT, QUIZ, Student Seminar, Project Based Learning.
		5.5	Topology – Adjacency, connectivity and containment	T1,T5,R2	2	PPT, NPTEL, Project Based Learning, Student Seminar
		5.6	Topological	T1,T5,R2	3	PPT, Student Seminar

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			Consistency – Non topological file formats			
		5.7	Attribute Data linking –Linking External Databases	T1,T5,R2	2	PPT, Project Based Learning, Student Seminar
		5.8	GPS Data Integration	T1,T5,R2	3	PPT, Project Based Learning, Student Seminar

TEXT BOOKS:

T1 Bhatta B (2008), 'Remote sensing and GIS', Oxford University Press

T2 Lillesand, T.M, R.W. Kiefer and J.W. Chipman (2013) 'Remote Sensing and Image Interpretation', Wiley India Pvt. Ltd., New Delhi

T3 Schowenger, R. A (2006) 'Remote Sensing' Elsevier publishers.

T4 Fundamentals of Remote Sensing' by George Joseph, Universities Press, 2013.

T5 Fundamentals of Geographic Information Systems' by Demers, M.N, Wiley India Pvt. Ltd, 2013.

REFERENCE:

R1 'Remote Sensing and its Applications' by Narayan LRA, Universities Press, 2012.

R2 'Concepts and Techniques of Geographical Information System' by Chor Pang Lo and A K W Yeung, Prentice Hall (India), 2006

E-LEARNING RESOURCES:

- https://nptel.ac.in
- https://onlinecourses.nptel.ac.in
- www.slideshare.net

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN: 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CE3201	D & DSS (R20)	III-II	Civil Engineering	5	A

COURSE OUTCOMES:

Upon successful completion of this course

CO 1: Analyze and design welded and bolted connections

CO 2: Design Tension members, simple and Built-up compression members

CO 3: Design Laterally-Supported and Laterally-Unsupported Beams

CO 4: Design Beam-Columns, Column Splices and Bases

CO 5: Analyze, Design and Detail Gantry girder and Roof Trusses

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
I	CO1:Analyze and design welded and bolted connections		**Unit-I Introduction**			
		1.1	Types of steel structures and components	T1, T2, R1	1	Chalk & Talk,
		1.2	Hot rolled structural steel	T1, T2, R1	2	PPT, Active Learning,
		1.3	Grades of structural steel and Mechanical properties of steel	T1, T2, R1	2	Chalk & Talk, PPT.
		1.4	Loads and Load combinations	T1, T2, R1	2	Chalk & Talk, PPT.
		1.5	Concepts of limit State Design – Limit State of Collapse and Limit State of Serviceability	T1, T2, R1	3	Chalk & Talk
		1.6	Plate / local buckling, Concept of Plasticity	T1, T2, R1	1	Chalk & Talk
		1.7	Advantages and disadvantages of steel structures	T1, T2, R1	1	Chalk & Talk, PPT

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		1.8	**Simple Connections:** Behavior of bolted connections	T1, T2, R1	1	Chalk & Talk
		1.9	failures & Limit States of Strength; Design provisions for bolts as per IS 800:2007;	T1, T2, R1	2	Chalk & Talk
		1.10	Design of plate – plate bolted connections subjected to axial load; Introduction to welding – Types of welds & welded joints;	T1, T2, R1	3	Chalk & Talk
		1.11	weld defects; Design provisions for welding as per IS 800:2007; Design of welded plate – plate connections subjected to axial load	T1, T2, R1	3	Chalk & Talk
		1.12	Advantages and disadvantages of bolted and welded connections	T1, T2, R1	1	Chalk & Talk, PPT
		1.13	**Eccentric (Bracket) Connections**: Bolted connection:	T1, T2, R1	1	Chalk & Talk
		1.14	Moment in-plane and perpendicular to plane of joint;	T1, T2, R1	3	Chalk & Talk
		1.15	Welded connection: Moment in-plane and perpendicular to plane of joint	T1, T2, R1	3	Chalk & Talk
II	CO2: Design Tension members, simple and Built-up compression members		**UNIT- II Tension Members**			
		2.1	**Tension Members:** Net area; shear-lag; failure modes and limit states of strength - yielding, rupture and block Shear;	T1, T2, R3	2	Chalk & Talk.
		2.2	Design provisions as per IS 800:2007; Design of Tension Members	T1, T2, R3	1	Chalk & Talk.
		2.3	**Compression Members:** Behavior of short, long and Intermediate members under axial compression	T1, T2, R3	2	Chalk & Talk, PPT.
		2.4	Effective length and Slenderness ratio	T1, T2, R3	1	Chalk & Talk.
		2.5	Types of Buckling; Limit states of strength and Design provisions as per IS 800:2007	T1, T2, R3	2	Chalk & Talk.
		2.6	Design of Struts and Simple Columns	T1, T2, R3	3	Chalk & Talk

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		2.7	Design of laced and battened built-up compression members.	T1, T2, R3	2	Chalk & Talk
III	CO3: Design Laterally-Supported and Laterally-Unsupported Beams		**UNIT-III Design of Beams**			
		3.1	Behavior of Laterally Supported Beams and Laterally Un-Supported Beams	T1, T2, R1	1	Chalk & Talk, PPT, Tutorial
		3.2	Lateral – Torsional Buckling and Elastic Critical Moment	T1, T2, R1	2	Chalk & Talk, Web Resources.
			MID-I EXAMINATIONS			
		3.3	Classification of beams and failure modes	T1, T2, R1	2	Chalk & Talk, PPT.
		3.4	Shear behavior; Design provisions as per IS 800: 2007	T1, T2, R1	2	Chalk & Talk,
		3.5	. Web-Crippling; Web Buckling; Deflection limits	T1, T2, R1	1	Chalk & Talk
		3.6	Design of Laterally Supported and Un-Supported Beams	T1, T2, R1	2	Chalk & Talk
		3.7	Design of Simple Beam to Column Web-Angle connection	T1, T2, R1	2	Chalk & Talk
IV	CO 4: Design Beam-Columns, Column Splices and Bases		**UNIT-IV Design of Beam-Columns**			
		4.1	**Design of Beam-Columns:** Behavior of beam-columns	T1, T2, R3	2	Chalk & Talk, PPT & Tutorial.
		4.2	P-delta effects	T1, T2, R3	1	Chalk & Talk,
		4.3	Equivalent moment factor; Failure modes	T1, T2, R3	1	Chalk & Talk
		4.4	Limit states of strength and Design provisions as per IS 800:2007	T1, T2, R1	2	Chalk & Talk
		4.5	Design of beam-column subjected to axial compression and bi-axial bending	T1, T2, R1	2	Chalk & Talk
		4.6	**Design of Column Splices and Bases:** Design of column splices	T1, T2, R1	2	Chalk & Talk
		4.7	Design of slab base and gusseted base	T1, T2, R1	2	Chalk & Talk
			UNIT-V Design of Gantry Girder			

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V	CO5: Analyze, Design and Detail Gantry girder and Roof Trusses	5.1	Design of Gantry Girder: EOT cranes	T1, T2, R3	2	Chalk & Talk,
		5.2	Vertical, lateral and longitudinal loads	T1, T2, R3	2	Chalk & Talk, Students Seminars.
		5.3	Impact factors,	T1, T2, R3	1	Chalk & Talk, Students Seminars.
		5.4	Design of Gantry girders.	T1, T2, R3	2	Chalk & Talk
		5.5	**Roof Trusses:** Different types of trusses	T1, T2, R3	1	Chalk & Talk
		5.6	Design loads – Dead, Live and Wind loads, Load combinations as per IS Codes,	T1, T2, R3	2	Chalk & Talk
		5.7	Design of simple Tubular roof trusses	T1, T2, R3	2	Chalk & Talk
		5.8	Purlin – rafter and joints.	T1, T2, R3	2	Chalk & Talk
		TOTAL			**80**	
		MID-II EXAMINATIONS				
		END EXAMINATIONS				

TEXT BOOKS

1. K. S. Sai Ram, Design of Steel Structures, Pearson Education (India), 2020
2. N. Subramanian, Design of Steel Structures, Oxford University Press (India), 2015

REFERENCES / FURTHER READING

1. S. K. Duggal, Limit State Design of steel structures, Tata McGraw-Hill, New Delhi, 2019
2. M. L. Gambhir, Fundamentals of Structural Steel Design, Tata McGraw-Hill, 2013
3. L. J. Morris and D.R. Plum, Structural Steel Work Design to BS 5950, Prentice-Hall, 1996
4. D. Lam et al., Structural Steelwork: Design to Limit State Theory (BS 5950), CRC press, 2004
5. D. Lam et al., Structural Steelwork: Design to Limit State Theory (EC3), CRC press, 2014
6. A. S. Arya and J. L. Ajmani, Design of Steel Structures *(working stress method)*, Nem chand publishers, 2001

IS Codes:

1. IS 800:2007, Indian Standard Code for General Construction in Steel, 3rd revision, Indian Standards Institution, New Delhi.
2. IS – 875 Parts I- III, Code of practice for design loads (other than earth quake) for buildings and Structures (Part-1-Part 5), Bureau of Indian standards.
3. Steel Tables

These codes and steel tables are permitted for use in the examinations.

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN: 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CE3202	**ENVIRONMENTAL ENGINEERING**	III-II	Civil Engineering	6	A & B

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Assess the quality and quantity of water requirements for a city. K2&K3
CO2	Design of different treatment units and distribution systems for water supply.K2&K3
CO3	Analyze the characteristics, collection, conveyance and disposal of wastewater.K2&K4
CO4	Design of sewers and various units in a wastewater treatment plant.K2&K4
CO5	Design of secondary and biological treatment units.K2&K3

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
UNIT – I : WATER DEMANDS- STANDARDS -SOURCES						
1	**CO1**:Assess the quality and quantity of water requirements for a city. K2&K3	1.1	Aspects of Environmental Engineering	T1, T2, R1	1	Chalk ,Talk & Web resources
		1.2	Protected water supply - Need	T1, T2, R4	1	PPT, Active Learning & NPTEL
		1.3	Water borne diseases	T1, T2, R1	1	PPT, Active Learning
		1.4	Water demands – Fluctuations	T1, T2, R2	2	case study & Tutorial
		1.5	Design period-Population forecast	T1, T2, R1	2	Chalk ,Talk & Model Demonstration
		1.6	Water quality– Drinking water standards	T1, T2, R4	2	PPT, Active Learning
		1.7	Testing and significance	T1, T2, R1	1	Chalk , Talk & Virtual labs
		1.8.1	Quality and Quantity and other considerations of surface and sub- surface sources	T1, T2, R3		Chalk, Talk & Web resources

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		1.8.2	Yield calculations	T1, T2, R1	1	PPT, Active Learning & NPTEL
		1.8.3	Intake works –Types of Intakes	T1, T2, R4	1	PPT, Active Learning
		1.9	Storage reservoir capacity – Systems of water supply_ Requirements	T1, T2, R1	1	Chalk ,Talk & Web resources
		1.9.1	Detection of leakages		1	PPT, Active Learning & NPTEL
		1.9.2	Selection of pump – Economical diameter of pumping main.		1	PPT, Active Learning
2	**CO2:** Design of different treatment units and distribution systems for water supply. K2&K3	**UNIT – II : TREATMENT OF WATER AND DISTRIBUTION:**				
		2.1	Water treatment, conventional	T1, T2, R3	1	Chalk , Talk & Industrial visit
		2.2	Treatment flow diagram	T1, T2, R3	1	PPT, Active Learning & Student seminars
		2.3	Sedimentation types – Principles – Design factors	T1, T2, R5	1	PPT, Active Learning & Quiz
		2.4	Coagulation –Design of Clariflocculator	T1, T2, R3	2	case study & Tutorial
		2.5	Filtration – Slow, Rapid gravity filters and Pressure filters	T1, T2, R6	2	Chalk , Talk & PPT
		2.6	Design principles-Disinfection – Theory of Chlorination	T1, T2, R3	2	PPT, Active Learning
		2.7	Distribution systems– Layouts	T1, T2, R7	2	Chalk ,Talk & NPTEL
		2.8	Design- and analysis	T1, T2, R7	2	Chalk & Talk, PPT, Tutorial
		2.9	Hardy Cross method and Equivalent Pipe method	T1, T2, R3	2	Chalk & Talk, PPT, Tutorial
		3.0	Valves – Other appurtenances.	T1, T2, R3	2	Chalk & Talk, PPT, Tutorial
		MID EXAMINATIONS-I				
3		**UNIT – III : WASTEWATER MANAGEMENT:**				
		3.1	Introduction: Waste water treatment system	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial
		3.2	Definitions of terms	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial

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	CO3: Analyze the characteristics , collection, conveyance and disposal of wastewater. K2&K4	3.3	Collection and conveyance of sewage	T1, T2, R1	2	PPT, Active Learning
		3.4	Sewage flow rates – Storm water	T1, T2, R1	2	PPT, Active Learning
		3.5	Characteristics of sewage	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial
		3.6	Cycles of decay – BOD – COD	T1, T2, R1	2	PPT, Active Learning
		3.7	Ultimate disposal of sewage	T1, T2, R1	2	PPT, Active Learning
		3.8	self-purification of rivers– sewage farming.	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial
4	**CO4:**Design of sewers and various units in a wastewater treatment plant.K2&K4	**UNIT – IV : DESIGN OF SEWERS AND PRIMARY TREATMENT:**				
		4.1	Layouts – Design of sewers– –	T1, T2, R3	1	Chalk , Talk & PPT
		4.2	Sewers appurtenances	T1, T2, R3	2	PPT, Active Learning & Student seminars
		4.3	Sewage pumping - Conventional sewage treatment	T1, T2, R3	2	PPT, Active Learning
		4.4	Primary treatment: - Screens – Grit chamber	T1, T2, R3	2	case study & Tutorial
		4.5	Sedimentation tanks – Design principles.	T1, T2, R2	2	Chalk , Talk & PPT
		4.6	Septic tanks	T1, T2, R2	2	PPT, Active Learning
		4.7	Imhoff tanks - rural latrines	T1, T2, R3	2	Chalk ,Talk & Model demonstration
		4.8	House plumbing	T1, T2, R3	2	Chalk ,Talk & Model demonstration
		4.9	Appurtenances.	T1, T2, R3	2	Chalk & Talk, PPT, Tutorial
5	**CO5:** Design of secondary and biological treatment units.K3&K3	**UNIT – V: SECONDARY BIOLOGICAL TREATMENT:**				
		5.1	Secondary treatment	T1, T2, R3	2	Chalk ,Talk & Tutorial
		5.2	Biological treatment	T1, T2, R5	1	PPT, Quiz & Active Learning
		5.3	Trickling filters	T1, T2, R5	2	PPT, Active Learning & Student seminars

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		5.4	Activated Sludge Process	T1, T2, R3	2	case study, web resources & Tutorial
		5.5	Low cost waste treatment methods	T1, T2, R4	2	Chalk , Talk & Model demonstration
		5.6	Design of Oxidation ponds	T1, T2, R8	2	Chalk , Talk & Model demonstration
		5.7	Aerobic and Anaerobic lagoons.	T1, T2, R3	1	PPT, Active Learning & Student seminars
		5.8	Sludge Digestion– Disposal.	T1, T2, R3	2	Chalk , Talk & Model demonstration
MID EXAMINATIONS-II						
				Total	80	
END EXAMINATIONS						

Text Books:

T1- B.C. Punmia B C, A.K. Jain and A.K. Jain, —Water Supply Engineeringl, LaxmiPublications.2nd Edition1995, Reprint 2005.

T2- B.C. Punmia, A.K. Jain and A.K. Jain, —Wastewater Engineering, Laxmi Publications, 2nd Edition 1998, Reprint 2014.

Reference Books:

R1- S.K. Garg, —Water Supply Engineeringl, Khanna Publishers, 26th revised Edition, New Delhi.2010.

R2- S.K. Garg, —Sewage disposal and Air Pollution Engineringl, Khanna Publishers New Delhi. 36th Edition, 2017.

R3- H.S. Peavy, D. Rowe, and G. Tchobanoglous, —Environmental Engineeringl, McGraw HillPublishers, New Delhi. 1985.

R4- G.S. Birdie and J.S. Birdie, —Water Supply and Sanitary Engineeringl Dhanpat Rai Publishing Company New Delhi, 6th Edition, 2002.

R5- K.N. Duggal, —Elements of Environmental Engineeringl, S.Chand & Company Limited, NewDelhi, 2007.

R6- P. N. Modi, —Sewage Treatment Disposal & Wastewater Engineeringl, Standard Book House, 2016.

R7- Manual on sewerage and sewage treatment, CPHEEO, Ministry of urban affairs and employment, Govt. of India, New Delhi, 2001.

R8- Water and Wastewater Engineering, NPTEL video lectures and web notes.

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CE3203	**HYDROLOGY& IRRIGATION ENGINEERING**	III-II	Civil Engineering	6	A & B

COURSE OUTCOMES:
At the end of the course, the student will be able to:

SNO	Course Outcome Statement
CO1	Understanding about Hydrologic cycle and Precipitation K2&K3
CO2	Understand the concepts of Abstractions of Precipitation i.e., Evaporation, Infiltration, Evapotranspiration.K2
CO3	To know the concepts of Runoff and to know about Hydrograph concept and to develop Hydrographs.K2&K3
CO4	To understand about Groundwater flow conditions. K2&K3
CO5	To understand about Irrigation Engineering. K2 & K3

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
I	**CO1:** Understanding about Hydrologic cycle and Precipitation K2&K3	**UNIT – I**				
		1.1	**Introduction**: Engineering hydrology and its applications, Hydrologic cycle, hydrological data-sources of data.	T1, R1	4	Chalk& Talk, PPT Active Learning
		1.2	**Precipitation**: Types and forms, measurement, rain gauge network, presentation of rainfall data, average rainfall, continuity and consistency of rainfall data	T1, R1	4	Chalk& Talk, PPT Active Learning
		1.3	Frequency of rainfall, Intensity-Duration-Frequency (IDF) curves, Depth-Area-Duration (DAD) curves,	T1, R1	4	Chalk& Talk, Active Learning
		1.4	Probable Maximum Precipitation (PMP), design storm	T1, R1	5	Chalk& Talk, PPT Active Learning

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2	CO2: Understand the concepts of Abstractions of Precipitation i.e., Evaporation, Infiltration, Evapotranspiration.K2	**UNIT – II**				
		2.1	**Abstractions from Precipitation: Initial** abstractions	T1, R1	5	Chalk& Talk, PPT Active Learning
		2.2	.**Evaporation**: Factors affecting, measurement, reduction.	T1, R1	5	Chalk& Talk, PPT Active Learning
		2.3	**Evapotranspiration:** Factors affecting, measurement, control.	T1, R1	5	Chalk& Talk, PPT Active Learning
		2.4	**Infiltration:** factors affecting, Infiltration capacity curve, measurement,	T1, R1	5	Chalk& Talk, PPT Active Learning
		2.5	Infiltration indices	T1, R1	5	Chalk& Talk, PPT Active Learning
3	**CO3:** To know the concepts of Runoff and to know about Hydrograph concept and to develop Hydrographs. K2&K3	**UNIT – III**				
		3.1	**Runoff:** Catchment characteristics, Factors affecting runoff, components, computation- empirical formulae,	T1, R1,R3	3	Chalk& Talk, PPT Active Learning
		3.2	Tables and curves, stream gauging, rating curve, flow mass curve and flow duration curve.	T1, R1,R3	3	Chalk& Talk, Active Learning
		3.3	**Hydrograph analysis**: Components of hydrograph, separation of base flow, effective rainfall hyetograph and direct runoff hydrograph	T1, R1,R3	3	Chalk& Talk, PPT Active Learning
		3.4	unit hydrograph, assumptions, derivation of unit hydrograph, unit hydrographs of different durations	T1, R1,R3	3	Chalk& Talk, Active Learning
		3.5	Principle of superposition and S-hydrograph methods, limitations and applications of unit hydrograph, synthetic unit hydrograph.	T1, R1,R3	3	Chalk& Talk, Active Learning

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4	**CO4:** To understand about Groundwater flow conditions. K2&K3 .	**UNIT – IV**				
		4.1	**Groundwater:** Occurrence, types of aquifers, aquifer parameters, porosity, specific yield, permeability, transmissivity and storage coefficient	T1, R1,R3	3	Chalk& Talk, PPT Active Learning
		4.2	Types of wells, Darcy's law,	T1, R1,R3	2	Chalk& Talk, PPT Active Learning
		4.3	Dupuit's equation- steady radial flow to wells in confined and unconfined aquifers	T1, R1,R3	3	Chalk& Talk, PPT Active Learning
		4.4	Yield of a open well-recuperation test.	T1, R1,R3	2	Chalk& Talk, PPT
5	**CO5:** To understand about Irrigation Engineering K2 & K3	**UNIT – V**				
		5.1	**Introduction to Irrigation:** Definition; Necessity; Scope of irrigation science; Benefits of irrigation; Ill-effects of irrigation; Types of irrigation.	T2, R2	4	Chalk& Talk, PPT Active Learning
		5.2	**Methods of Irrigation:** Methods of applying water to crops; Uncontrolled or wild flooding; Free flooding; Contour laterals; Border strip method; Check flooding; Basin flooding; Zigzag method; Furrow method; Contour Farming; Subsurface irrigation; Sprinkler irrigation; Drip irrigation. **Water Requirement of Crops:** Functions of irrigation water; Classes and availability of soil water; Saturation capacity; Field capacity; Wilting point; Available moisture and readily available moisture; Moisture equivalent; Soil – moisture deficiency; Limiting soil moisture conditions	T2, R2	4	Chalk& Talk, PPT Active Learning
		5.3	Depth and frequency of irrigation; Duty and Delta; Base period; Relation between Duty and Delta; Factors affecting duty; Methods of	T2, R2		

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			improving duty; Gross command area; Culturable command area; Culturable cultivated and uncultivated area; Kor depth and Kor period; Consumptive use of water ;			PPT Active Learning
		5.4	Irrigation efficiencies – Water conveyance efficiency, Water application efficiency, Water distribution efficiency and Consumptive use efficiency; Determination of irrigation requirements of crops; crop rotation, Assessment of Irrigation water.Stabilization Type of admixtures, mechanism	T2, R2	3	Chalk& Talk, PPT Active Learning
				Total	75	

TEXT BOOKS:

1. Engineering Hydrology, Jayarami Reddy, P., Laxmi Publications Pvt. Ltd., (2013), NewDelhi

2.Irrigation and Water Power Engineering, B. C. Punmia, Pande B. B. Lal, Ashok Kumar Jain and Arun Kumar Jain, Lakshmi Publications (P)Ltd.

3. Sharma , S.K (2016) " Irrigation Engineering", S.chand publisher New Delhi.

REFERENCES BOOKS:

1.Engineering Hydrology Subramanya, K, Tata McGraw-Hill Education PvtLtd, (2013),New Delhi.

2.Irrigation Engineering and Hydraulic Structure, Santosh Kumar Garg, Khanna Publishers.

3.Chow , V.T.Maidment,D.K and Mays L.W(2011)."Applied hydrology",Tata McGraw Hills Education Pvt ltd, New Delhi.

4.Mays L.W, Wiley India Pvt. Ltd,(2013). "Water Resources Engineering" Wiley India Pvt.Ltd.

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN (2024-2025)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CE3204	FOUNDATION ENGINEERING (R20)	III-II	Civil Engineering	6	A & B

COURSE OUTCOMES:

At the end of the course, the student will be able to:

SNO	Course Outcome Statement
CO1	The student must be able to understand the various types of shallow foundations and decide on their location based on soil characteristics
CO2	The student must be able to compute the magnitude of foundation settlement and decide on the size of the foundation accordingly.
CO3	The student must be able to use the field test data and arrive at the bearing capacity.
CO4	The student must be able to apply the principles of bearing capacity of piles and design them accordingly.

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1:** The student must be able to understand the various types of shallow foundations and decide on their location based on soil characteristics K1 & K2	**UNIT – I SOIL EXPLORATION**				
		1.1	Soil exploration needs, Methods of soil exploration	T2, R1	15	Chalk & Talk, Active
		1.2	Borings and Sampling Methods, Field Tests, and Penetration Tests	T2, R1		
		1.3	Pressure Meter, Planning of Programme	T2, R1		
		1.4	Preparation of Soil Investigation Report	T2, R1		
2	**CO2:** The student must be able to compute the magnitude of foundation settlement and decide on the size of the foundation accordingly K3&K4	**UNIT – II EARTH AND EARTH-RETAINING STRUCTURES**				
		2.1	Infinite and finite earth slopes in sand and clay, types of failures	T1, R1, R2	22	Chalk & Talk, Tutorial
		2.2	Factor of Safety of Infinite slopes, Stability analysis by Swedish arc method, Standard Method of Slices	T1, R1, R2		
		2.3	Taylor's Stability Number, Stability of slopes of dams and embankments, different conditions	T1, R1, R2		

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		2.4	Rankine's & Coulomb's theory of earth pressure, Culmann's graphical method, Earth pressures in layered soils	T1, R1, R2		
3	**CO3:** The student must be able to use the field test data and arrive at the bearing capacity K3&K4	**UNIT – III SHALLOW FOUNDATIONS – BEARING CAPACITY CRITERIA**				
		3.1	Types of foundations and factors to be considered in their location	T2, R1, R2	13	Chalk & Talk, Tutorial
		3.2	Bearing capacity, criteria for determination of bearing capacity, factors influencing bearing capacity	T2, R1, R2		
		3.3	Analytical methods to determine bearing capacity, Terzaghi's theory - IS Methods	T2, R1, R2		
4	**CO4:** The student must be able to use the field test data and arrive at the bearing capacity K2, K3&K4	**UNIT – IV SHALLOW FOUNDATIONS – SETTLEMENT CRITERIA**				
		4.1	Safe bearing pressure based on N-value	T1, T2, R2	13	Chalk & Talk, Tutorial
		4.2	Allowable bearing pressure; safe bearing capacity and settlement from plate load test	T1, T2, R2		
		4.3	Types of foundation settlements and their determination, allowable settlements of structures	T1, T2, R2		
5	**CO4:** The student must be able to apply the principles of bearing capacity of piles and design them accordingly K2, K3&K4	**UNIT – V DEEP FOUNDATIONS**				
		5.1	**Pile Foundation**: Types of piles, Load carrying capacity of piles based on static pile formulae	T1, T2, R2	12	Chalk & Talk, Tutorial
		5.2	Dynamic pile formulae, Pile load tests, Load carrying capacity of pile groups in sands and clays	T1, T2, R2		
		5.3	**Well Foundations:** Types, Different shapes of well, Types of cassions, Components of well	T1, T2, R2		
		5.4	Functions, forces acting on well foundations, Design Criteria, Determination of steining thickness and plug, construction and sinking of wells, Tilt and shift.	T1, T2, R2		
Total					75	

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TEXT BOOKS

1. 'Principles of Foundation Engineering' by Das, B.M., - (2011) –6th edition (Indian edition) Cengage learning
2. 'Basic and Applied Soil Mechanics' by Gopal Ranjan& ASR Rao, New Age International Pvt. Ltd, (2004), Soil mechanics & foundation engineering by Arora

REFERENCES / FURTHER READING

1. Foundation Analysis and Design' by Bowles, J.E., (1988) – 4th Edition, McGraw-Hill Publishing Company, New York.
2. 'Theory and Practice of Foundation Design' by N.N.SOM & S.C.DAS PHI Learning Private limited.

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DEPARTMENT OF CIVIL
LESSON PLAN (A.Y-2024-2025)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC32MC01	EITK (R20)	III/II	CIVIL	2	A

COURSE OUTCOMES:

After successful completion of the course students will be able to

- Understand the philosophy of Indian Culture [K2].
- Know the Indian languages, Epics Ramayana and Mahabharata [K2].
- Acquire the information about Indian arts and architecture [K4].
- Know the spread of cultural exchange in abroad [K4].
- Know the contributions of scientists in different eras [K4].

Ui No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			Unit-1. Indian Culture: An Introduction			
1	CO1: Understand the philosophy of Indian Culture [K2].	1.1	Characteristics, Significance and Geography of Indian culture	T1, R1	3	Web Resources
		1.2	Society in India through ages- Ancient period	T1, R1	1	Chalk & Talk
		1.3	Varna and jati, family and marriage in India	T1, R1	1	Chalk & Talk
		1.4	Position of women in ancient India	T1,R1	1	PPT
		1.5	Contemporary period; caste system and communalism	T1,R1	1	Chalk & Talk
			Unit-2. Indian Languages and Literature			
2	CO2: Know the Indian languages, Epics Ramayana and Mahabharata [K2].	2.1	Evolution of script and languages in India: Harappan Script and Brahmi Script	**T1, R1**	1	Web Resources
		2.2	Short History of the Sanskrit literature: The Vedas, The Brahmanas	**T1, R1**	1	Chalk & Talk
		2.3	Short History of the Sanskrit literature: Upanishads & Sutras	**T1, R1**	1	Chalk & Talk
		2.4	Epics: Ramayana	**T1, R1**	1	PPT
		2.5	Epics: Mahabharata	**T1, R1**	1	Chalk & Talk
			Unit-3. Indian Arts and Architecture			
3	CO3: Acquire the information about Indian arts and architecture [K4].	3.1	Indian Art & Architecture: Hindu Temple Architecture	**T1, R1**	1	Web Resources
		3.2	Indian Art & Architecture: Buddhist Architecture	**T1, R1**	1	Chalk & Talk
		3.3	Indian Art & Architecture: Medieval Architecture	**T1, R1**	1	Chalk & Talk
			MID I EXAMINATION			
		3.4	Rise of modern theatre	T1, R1		Chalk & Talk
		3.5	Rise of Indian cinema	T1, R1		PPT

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4	CO4: Know the spread of cultural exchange in abroad [K4].	**Unit-4. Spread of Indian Culture Abroad**				
		4.1	Causes, Significance and Modes of Cultural Exchange	T2, R2	3	Web Resources
		4.2	Through Traders, Teachers, Emissaries, Missionaries and Gypsies	T2, R2	1	Chalk & Talk
		4.3	India, Central Asia through ages	T2, R2	1	Chalk & Talk
		4.4	India, Western World through ages	T2, R2	1	PPT
5	CO5: Know the contributions of scientists in different eras [K4].	**Unit 5. Education System in India**				
		5.1	Education in ancient, medieval and modern India	T2, R2	1	Web Resources
		5.2	aims of education, Science of ancient India	T2, R2	1	PPT
		5.3	aims of education, Science of Modern India	T2, R2	1	Chalk & Talk
		5.4	Scientists of ancient India,	T2, R2	1	Chalk & Talk
		5.5	Scientists of Modern India	T2, R2	1	Chalk & Talk
				Total	28	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Kapil Kapoor, "Text and Interpretation: The indian tradition" ISBN: 81246033375, 2005
T2	" Science in Samskrit", Samskrita Bharti Publisher , ISBN 13 : 978- 8187276333,2007
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	NCERT , "Position Paper On Arts ,Music, Dance Theatre", ISBN 81-7450 494-X,200
R2	The indian tradition by PM Bakshi, Universal law publishing co

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PRINCIPAL

NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC2OE01	**Remote Sensing & GIS (R20)**	III-II	Civil Engineering	4	A

COURSE OUTCOMES:

CO1 Be familiar with ground, air and satellite based sensor platforms. K1&K2
CO2 Interpret the aerial photographs and satellite imageries.K2&K3
CO3 Create and input spatial data for GIS application. K2&K3
CO4 Development of Vector and Raster data models K3 &K4
CO5 Apply GIS analysis to address geospatial problemsK3&K4

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
UNIT – 1	**INTRODUCTION TO REMOTE SENSING**					
1	Be familiar with ground, air and satellite based sensor platforms.	1.1	Basic concepts of remote sensing	T1,T2,R1	1	Chalk & Talk, PPT
		1.2	electromagnetic radiation, electromagnetic spectrum,	T1,T2,R1	1	Chalk & Talk, PPT
		1.3	interaction with atmosphere, energy interaction with the earth surfaces	T1,T3,R1	1	Chalk & Talk, PPT
		1.4	characteristics of remote sensing systems, types of resolutions - advantages & limitations	T1,T2,R1	2	Chalk & Talk, PPT
		1.5	**SENSORS AND PLATFORMS:** Introduction, types of sensors, airborne remote sensing, space borne remote sensing,	T1,T3,R1	1	Chalk & Talk, PPT
		1.6	image data characteristics, digital image data formats-band interleaved by pixel, band interleaved by line, band sequential	T1,T3,R1	1	Chalk & Talk, PPT

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		1.7	IRS, LANDSAT, SPOT & Recent satellite.	T1,T3,R1	2	Chalk & Talk, PPT
UNIT – II IMAGE ANALYSIS						
2	Interpret the aerial photographs and satellite imageries	2.1	Introduction, elements of visual interpretations	T1,T1,R1	2	Chalk & Talk, PPT
		2.2	digital image processing- image pre- processing, image enhancement	T2,T3,R1	2	Chalk & Talk, PPT
		2.3	Image classification, supervised classification, unsupervised classification.	T1,T2,R2	2	Chalk & Talk, PPT
		2.4	Overlay function-vector overlay operations.	T2,T3,R1	2	Chalk & Talk, PPT
		2.5	Raster overlay operations	T1,T3,R1	2	Chalk & Talk, PPT
		2.6	Network analysis	T1,T2,R1	2	Chalk & Talk, PPT, Virtual Labs, Problem based Learning
UNIT – III GEOGRAPHIC INFORMATION SYSTEM						
3	Create and input spatial data for GIS application	3.1	Basic Principles, Coordinate systems, GIS and Information systems	T1,T5,R1	2	Chalk & Talk, PPT, NPTEL
		3.2	Definitions – History of GIS	T1,T5,R2	2	Chalk & Talk, PPT, Web Resources
		3.3	Components of GIS – Hardware, Software, Data, People, Methods, Proprietary and open source Software	T1,T5,R2	2	Chalk & Talk, PPT
		3.4	Types of Data – Spatial, Attribute data	T1,T5,R1	2	Chalk & Talk, PPT, Web Resources
		3.5	Types of Attributes-Scales components,	T1,T5,R2	2	Chalk & Talk, PPT
		3.6	Application areas of GIS.	T1,T5,R1	2	Chalk & Talk, PPT, Case studies.
		3.7	Map projections	T1,T5,R2	2	Chalk & Talk, PPT, Tutorials
UNIT – IV SPATIAL DATA MODELS						

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4	Development of Vector and Raster data models.	4.1	Database Structures – Relational, Object Oriented – Entities – ER diagram	T1,T5,R2	2	Chalk & Talk, PPT, NPTEL, Problem based Learning
		4.2	Data models conceptual, logical and physical models	T1,T5,R2	1	Chalk & Talk, PPT, NPTEL, Model Demonstration
		4.3	Spatial data models – Raster Data Structures	T1,T5,R2	1	Chalk & Talk, PPT, QUIZ
		4.4	Raster Data Compression	T1,T5,R2	2	Chalk & Talk, PPT, NPTEL
		4.5	Vector Data Structures	T1,T5,R2	2	Chalk & Talk, PPT, NPTEL, Problem based Learning
		4.6	Raster vs Vector Models	T1,T5,R2	2	Chalk & Talk, PPT, NPTEL,
		4.7	TIN and GRID data models.	T1,T5,R2	2	Chalk & Talk, PPT, NPTEL Student Seminar, Project based Learning.
UNIT – V DATA INPUT AND TOPOLOGY						
V	Apply GIS analysis to address geospatial problems	5.1	Scanner – Raster Data Input	T1,T5,R2	1	Chalk & Talk, PPT, Model Demonstration
		5.2	Raster Data File Formats	T1,T5,R2	2	Chalk & Talk, PPT
		5.3	Georeferencing – Vector Data Input – Digitiser	T1,T5,R2	2	Chalk & Talk, PPT, Project Based Learning.
		5.4	Datum Projection and reprojection – Coordinate Transformation	T1,T5,R2	2	Chalk & Talk, PPT, QUIZ, Student Seminar, Project Based Learning.
		5.5	Topology – Adjacency, connectivity and containment	T1,T5,R2	2	PPT, NPTEL, Project Based Learning, Student Seminar
		5.6	Topological	T1,T5,R2	2	PPT, NPTEL, Student Seminar

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			Consistency – Non topological file formats			
		5.7	Attribute Data linking –Linking External Databases	T1,T5,R2	2	PPT, Project Based Learning, Student Seminar
		5.8	GPS Data Integration	T1,T5,R2	2	PPT, Project Based Learning, Student Seminar
				Total	62	

TEXT BOOKS:

T1 Bhatta B (2008), 'Remote sensing and GIS', Oxford University Press

T2 Lillesand, T.M, R.W. Kiefer and J.W. Chipman (2013) 'Remote Sensing and Image Interpretation', Wiley India Pvt. Ltd., New Delhi

T3 Schowenger, R. A (2006) 'Remote Sensing' Elsevier publishers.

T4 Fundamentals of Remote Sensing' by George Joseph, Universities Press, 2013.

T5 Fundamentals of Geographic Information Systems' by Demers, M.N, Wiley India Pvt. Ltd, 2013.

REFERENCE:

R1 'Remote Sensing and its Applications' by Narayan LRA, Universities Press, 2012.

R2 'Concepts and Techniques of Geographical Information System' by Chor Pang Lo and A K W Yeung, Prentice Hall (India), 2006

E-LEARNING RESOURCES:

- https://nptel.ac.in
- https://onlinecourses.nptel.ac.in
- www.slideshare.net

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN A.Y. 2025-26

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC30E14	Services Marketing	IV-I	CE	5	A

COURSE OUTCOMES: Students are able to

CO1: Know the basic concepts and classification of services. [K3]
CO2: Understand customer needs and expectations. [K2]
CO3: Explain the process of market segmentation in services marketing. [K2]
CO4: Explain role of marketing communication in service promotion. [K2]
CO5: Evaluate the consumer grievance recovery strategies. [K5]

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
1	CO 1.[K4] Analyze the basic concepts of service marketing	**Unit-1.Introduction To Service Marketing**				
		1.1	Introduction to service marketing	T1, T2, R1	1	Chalk & Talk, PPT, Web Resources,
		1.2	Characteristics of services	T1, T2, R1	2	
		1.3	Nature and Importance of services	T1, T2, R1	1	
		1.4	Growth of service sector in India	T1,R1	1	
		1.5	Classification of services	T1, T2, R1	1	
		1.6	Marketing services Vs Physical services	T1, T2, R1	1	
		1.7	Service Strategy	T1, T2, R1	1	
ASSIGNMENT-1 DURING FIFTH WEEK						
2	CO2.[K2] Understand customer needs and expectations.	**Unit-2. Consumer Behaviour in Services**				
		2.1	Nature of relationship marketing and its service consumption	T1, T2, R1	2	Chalk & Talk, PPT, Web Resources,
		2.2	Understanding customer needs and expectations	T1, T2, R1	2	
		2.3	Creating and maintaining valued relations	T1, T2, R1	3	
		2.4	Customer loyalty	T1, T2, R1	2	
MID I EXAMINATION DURING NINTH WEEK						
3	CO 3[K2] Explain the process of market segmentation in services marketing.	**Unit-3Service Market Segmenatations**				
		3.1	Market segmentation process	T1, T2, R1	2	Chalk & Talk, PPT, Web Resources,

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		3.2	Selecting the appropriate customer portfolio	T1, T2, R1	2	
		3.3	Value addition to the service product	T1, T2, R1	2	
		3.4	Planning and branding service products	T1, T2, R1	1	
		3.5	New service development		1	
ASSIGNMET-II DURING TWELETH WEEK						
4	CO 4.[K2] Explain role of marketing communication in service promotion.	**Unit 5. Service Promotion**				
		4.1	The role of marketing communication.	T1, T2, R3	3	Chalk & Talk, PPT, Web Resources,
		4.2	Marketing communication mix.	T1, T2, R3	3	
		4.3	Planning and managing service delivery,creating delivery systems in price and cyberspace	T1, T2, R2	4	
		4.4	The role of intermediaries.	T1,R2	3	
5	CO 5.[K5] Evaluate the consumer grievance recovery strategies.	**Unit 6.**External Marketing				
		5.1	Introduction to interactive Marketing.	T1, T2, R1	3	Chalk & Talk, PPT, Web Resources,
		5.2	Management of Moments of Truth	T1, T2, R1	3	
		5.3	Service deficiencies, and consumer grievance recovery strategies.	T1, T2, R1	3	
		5.4	Managing physical evidence andinternal marketing.	T1, T2, R1	3	
				Total	60	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS:

T1: Services Marketing C.Bhattacharjee, Excel Books, New Delhi, 2010

T2: Service Management and Marketing, Christian Gronroos, Wiley India, NewDelhi, 2010

REFERENCES:

R1: Services Marketing, GovindApte:, Oxford University Press, New Delhi,2010

R2: S.L.Gupta, Marketing of Services, WisdomPublication.2003

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC4OE02	CONSTRUCTION TECHNOLOGY AND MANAGEMENT (R20)	IV-I	Civil Engineering	6	A & B

COURSE OUTCOMES:

CO1	To understand the concept of project management including network drawing and monitoring. K1 & K2
CO2	Appreciate the importance of construction planning and Project Management. K1 & K2
CO3	Apply the gained knowledge to project Planning and Control. K1 & K3
CO4	To understand the concept of cost control and resource management. K1 & K2
CO5	Apply the concept of Quality control and Safety Management in construction. K1 & K3

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
UNIT – I	**INTRODUCTION:**					
1	To understand the concept of project management including network drawing and monitoring. K1 & K2	1.1	Construction projects-Project management-Main causes of project failure	T1,T2,R1	2	Chalk & Talk, Students Seminars
		1.2	Origin of PERT and CPM, Planning, Scheduling and controlling	T1,T2,R2	2	Chalk & Talk
		1.3	Bar charts, Milestone charts, weaknesses in Bar charts, PERT and CPM networks – Comparison	T2,T3,R2	3	PPT
		1.4	Event, Activity, Rules for drawing networks	T1,T2,R4	3	PPT, Chalk & Talk
		1.5	Numbering the events (Fulkerson's law), Dummy activities	T4,T2,R3	3	Chalk & Talk
UNIT – II	**PROJECT MANAGEMENT THROUGH NETWORKS AND COST CONTROL:**					
2	Appreciate the importance of construction	2.1	Time estimate-Expected time, Earliest allowable occurrence time, Latest allowable occurrence time	T4,T5,R6	3	Chalk & Talk, Project based learning
		2.2	slack, project duration, probability of completion	T3,T4,R3	2	Chalk & Talk, Project based learning
		2.3	Start and Finish time estimates,	T3,T4,R	2	Chalk & Talk,

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	planning and Project Management. K1 & K2		Floats			Problem based learning
		2.4	Project scheduling, Critical and sub-critical path	T2,T5,R2	3	Chalk & Talk, Project based learning
		2.5	Updating – Process of updating	T1,T4,R1	1	Chalk & Talk, Active Learning
		2.6	Direct cost- indirect cost- total project cost	T3,T4,R3	2	NPTEL/MOOCS
		2.7	Optimization of cost through networks	T2,T3,R2	2	Chalk & Talk, Tutorial
		2.8	Steps involved in optimization of cost	T1,T2,R4	1	PPT, Students Seminars
Mid examinations-I						
UNIT – III PROJECT PLANNING & ORGANIZATION AND CONTRACTS:						
3	Apply the gained knowledge to project Planning and Control. K1 & K3	3.1	Development of project plan, objective and conception	T2,T3,R2	2	Chalk & Talk, Project based learning
		3.2	Programming – Scheduling – Project Organization	T3,T4,R3	2	PPT, Tutorial
		3.3	Project budget fund flow statement – Controlling system	T1,T4,R2	2	Chalk & Talk, Active Learning
		3.4	Introduction to Contracts and its types	T2,T3,R3	1	PPT, Tutorial
		3.5	Contract document – Specifications – Important conditions of contract	T3,T4,R1	3	Chalk & Talk, Active Learning
		3.6	Tender and tender document	T2,T5,R1	2	Chalk & Talk, Active Learning
		3.7	Deposits by the contractor – Arbitration	T3,T5,R3	2	PPT, Web Resources
		3.8	M. Book, R.A Bills & Advances – Muster Roll	T2,T3,R2	3	Chalk & Talk, Active Learning
UNIT – IV RESOURCE MANAGEMENT:						
4	To understand the concept of cost control and resource management. K1 & K2	4.1	Introduction to Resource Management	T1,T2,R3	1	Chalk & Talk, PPT
		4.2	Resource smoothing- Resource leveling	T1,T2,R3	2	PPT, Tutorial
		4.3	Objectives of material management- Costs- Functions of material management department	T1,T2,R4	3	PPT, Active Learning
		4.4	ABC classification of materials	T2,T3,R3		Chalk & Talk, Active Learning

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		4.5	Introduction to Green Technologies-NBC code book-2016	T1,T4,R3	2	Students Seminars, PPT
UNIT – V QUALITY CONTROL AND SAFETY MANAGEMENT:						
5	Apply the concept of Quality control and Safety Management in construction. K1 & K3	5.1	Importance of quality- Elements of quality	T1,T3,R6	1	PPT, Student Seminars
		5.2	Organization for quality control- Quality assurance techniques	T1,T3,R6	2	Tutorial, Active Learning
		5.3	Total quality management- ISO – 9000	T1,T3,R6	1	Chalk & Talk, PPT
		5.4	Accident prevention program- immediate attention in case of accident	T1,T3,R6	2	Tutorial, Web resources
		5.5	Approaches to improve safety in construction- Safety benefits	T1,T3,R6	2	NPTEL/MOOCS
		5.6	Prevention of fires in construction industries	T1,T3,R6	1	PPT, Student Seminars
		5.7	Safety information system	T1,T3,R6	2	PPT, Problem based learning
Mid examinations-II						
				Total	66	
END EXAMINATIONS						

TEXT BOOKS:

T1. Construction Engineering and Management by Dr. S. Seetharaman- Umesh Publications, Nai Sarark, Delhi.

T2. Fundamentals of PERT/CPM and Project Management by S. K. Bhattacharjee- Khanna Publishers, Nai Sarak- Delhi

T3. S. Sanga Reddy & Meyyappan, "Construction Management", Kumaran Publications, 2009

T4. Gahlot, P.S & Dhir, D.M., "Construction Planning and Management", Wiley Eastern Limited, 1992

T2. Punmia B.C., "Project Planning and Control with PERT and CPM", Laxmi Publications, New Delhi, 1987.

REFERENCE:

R1. Construction Management & Planning by B. Sengupta & H. Guha- Tata Mc Graw – Hill Publishing Co. Ltd., New Delhi

R2. Construction Planning, Equipment & Methods by Peurifoy R. L. - Mc Graw – Hill International Book Company

R3. PERT and CPM – Punmia, Laxmi Publications, 3rd edition 1987

R4. PERT & CPM Principles and applications by L. S. Srinath- Affiliated East West Press

R5. Jerome D. Wiest & K. Levy, "Management Guide to PERT/CPM"

R6. Clough R.H. & Sears. G.A, "Construction Project Management" 2008

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CE4104	PRESTRESSED CONCRETE (R20)	IV-I	Civil Engineering	6	A

COURSE OUTCOMES:

SNO	Course Outcome Statement
CO1	Understand the different methods of pre stressing
CO2	Estimate the effective pre stress including the short and long term losses
CO3	Analyze and design pre stressed concrete beams under flexure and shear
CO4	Understand the relevant IS Codal provisions for pre stressed concrete

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
UNIT – I INTRODUCTION &METHODS AND SYSTEMS OF PRE-STRESSING						
I	Understand the different methods of pre stressing	1.1	Historic development	T1,T2,R1	1	PPT, Chalk & Talk
		1.2	General principles of pre stressing pre tensioning and post tensioning	T1,T2,R1	2	PPT, Chalk & Talk
		1.3	Application of pre stressed concrete	T1,T3,R1	1	PPT, Chalk & Talk
		1.4	Advantages and limitations of pre stressed concrete	T1,T2,R1	1	PPT, Chalk & Talk
		1.5	General principles of PSC	T1,T2,R1	1	PPT, Chalk & Talk
		1.6	Classification and types of pre-stressing-Materials	T1,T2,R1	2	PPT, Chalk & Talk
		1.7	Materials – High strength concrete	T1,T3,R1	3	PPT, Chalk & Talk
		1.8	Materials – high tensile steel their characteristics.	T1,T2,R1	3	PPT, Chalk & Talk
METHODS AND SYSTEMS OF PRESTRESSING						

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	Understand the different methods of pre stressing	1.9	Pre-tensioning methods	T1,T1,R1	2	Chalk & Talk
		1.10	post tensioning methods	T2,T3,R1	2	Chalk & Talk
		1.11	Analysis of post tensioning	T1,T2,R2	2	Chalk & Talk
		1.12	Different systems of pre stressing like Hoyer System	T2,T3,R1	1	Chalk & Talk
		1.13	Magnel System	T1,T3,R1	1	Chalk & Talk
		1.14	Freyssinet system	T1,T2,R1	1	Chalk & Talk
		1.15	Gifford – Udall System.	T1,T2,R1	1	Chalk & Talk
		1.16	Lee McCall system	T1,T2,R1	1	Chalk & Talk
		FLEXURE				
		1.17	Analysis of sections for flexure	T1,T2,R1	1	Chalk & Talk
		1.18	beams pre-stressed with straight Tendon	T2,T3,R1	2	Chalk & Talk
		1.19	Concentric tendon-problems	T2,T3,R1	2	Chalk & Talk
		1.20	Eccentric tendon-problems	T1,T2,R1	2	Chalk & Talk
		1.21	Bent tendon-problems	T2,T3,R1	2	Chalk & Talk
		1.22	parabolic tendon-problems	T2,T3,R1	2	Chalk & Talk
		1.23	Line of Thrust – Pressure Line	T1,T2,R1	2	Chalk & Talk
		1.24	Load Balancing Concept	T2,T3,R1	2	Chalk & Talk
UNIT – II LOSSES OF PRESTRESS						
II	Estimate the effective pre stress including the short and long term losses.	2.1	Loss of pre-stress in pre-tensioned and post-tensioned members due to various causes like elastic shortage of concrete	T1,T3,R1	3	Chalk & Talk
		2.2	Elastic shortage of concrete problems	T1,T3,R2	2	Chalk & Talk
		2.3	shrinkage of concrete and problems	T1,T3,R2	2	Chalk & Talk
		2.4	creep of concrete-problems	T1,T3,R1	2	Chalk & Talk
		2.5	Relaxation of steel-problems	T1,T3,R2	2	Chalk & Talk
		2.6	slip in anchorage bending of member-problems	T1,T3,R1	2	Chalk & Talk
		2.7	frictional losses-problems	T2,T3,R2	2	Chalk & Talk
		2.8	Total loss and allowable loss of pre-stress for design	T2,T3,R2	2	Chalk & Talk

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UNIT – III DESIGN FOR FLEXURE						
III	Analyze and design pre stressed concrete beams under flexure and shear.	3.1	Types of failure	T1,T3,R2	1	PPT, Chalk & Talk
		3.2	Code procedures	T1,T3,R2	2	Chalk & Talk
		MID-I EXAMINATIONS				
		3.3	Design for flexure using IS Code (IS 1343 -2012) Cable profile in two span continuous members.	T1,T3,R2	3	Chalk & Talk
UNIT – IV DEFLECTIONS						
IV	Analyze and design pre stressed concrete beams under flexure and shear.	4.1	Importance of control of deflections	T2,T3,R1	1	PPT, Chalk & Talk
		4.2	Factors influencing deflections	T1,T3,R2	1	Chalk & Talk
		4.3	Short term deflections of uncracked beams	T1,T3,R2	2	Chalk & Talk
		4.4	prediction of long time deflections	T1,T3,R2	2	Chalk & Talk
		4.5	IS code requirements.	T2,T3,R1	1	Chalk & Talk
		COMPOSITE BEAMS				
		4.6	Different Types- Propped and Unpropped	T1,T3,R2	1	Chalk & Talk
		4.7	stress distribution	T1,T3,R2	1	Chalk & Talk
		4.8	Differential shrinkage	T1,T3,R2	1	Chalk & Talk
		4.9	Analysis of composite beams	T1,T3,R2	2	Chalk & Talk
		4.10	Deflection of determinate composite beam	T1,T3,R2	2	Chalk & Talk
UNIT – V DESIGN FOR SHEAR AND TORSION						
V	Understand the relevant IS Codal provisions for pre stressed concrete.	5.1	Shear and Principal Stresses	T1,T3,R2	2	Chalk & Talk
		5.2	Design of Shear reinforcement	T1,T3,R2	3	Chalk & Talk
		5.3	Code Provisions	T1,T3,R2	1	Chalk & Talk
		5.4	Design for Torsion	T2,T3,R1	2	Chalk & Talk
		5.5	Design for Combined bending, shear and torsion	T1,T3,R2	2	Chalk & Talk
			TOTAL		**87**	
		MID-II EXAMINATIONS				

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TEXT BOOKS:

1. Prestressed Concrete by Krishna Raju- - Tata Mc.Graw Hill Publications.
2. Prestressed Concrete by N.Rajasekharan- - Narosa publications.
3. Pre stressed concrete by N Raj Gopal.

REFERENCE:

1. Pre-tressed Concrete by Ramamrutham- Dhanpatrai Publications.
2. Design of Prestressed concrete structures (Third Edition) by T.Y. Lin & Ned H.Burns- John Wiley & Sons.

Codes: BIS code on pre stressed concrete- IS 1343

E-LEARNING RESOURCES:

http://nptel.ac.in/courses.php
http://jntuk-coeerd.in/

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CE4105	WATERSHED MANAGEMENT	IV-I	Civil Engineering	6	A

COURSE OUTCOMES:

At the end of the course, the student will be able to:

SNO	Course Outcome Statement
CO1	Understand about need of watershed K1&K2
CO2	Analyse watershed characteristics to take appropriate management action. K1&K2
CO3	Quantify soil erosion and design control measures. K1&K2
CO4	Apply land grading techniques for proper land management. K1&K2
CO5	Suggest suitable harvesting techniques for better watershed management K1&K2

Unit No	Course Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1: Understand about need of watershed K1&K2	**UNIT – I**				
		1.1	**INTRODUCTION:** Concept of watershed development,	T1, T2,T3, R1	2	PPT, Chalk, Talk & Tutorial
		1.2	Objectives of watershed development	T1,T2, T3, R1	3	PPT, Talk & Tutorial
		1.3	Need for watershed development	T1,T2, T3, R1	3	PPT, Talk & Tutorial
		1.4	Integrated approach for watershed management.	T1,T2, T3,R1	3	PPT, Talk & Tutorial
		1.5	Multidisciplinary approach for watershed management	T1, T2, R1	3	PPT, Talk & Tutorial
2	**CO2** Analyse watershed characteristics to take appropriate management action. K1&K2. K2&K3	**UNIT – II**				
		2.1	**CHARACTERISTICS OF WATERSHEDS:** Physiography - Size, shape, slope, drainage;, geology and soils,	T1,T2, T3, R1	3	PPT, Talk & Tutorial
		2.2	Climate, land use, vegetation	T1,T2, R1,R2	3	PPT, Talk & Tutorial
		2.3	Hydrology and hydrogeology	T1,T2, R1,R2	4	PPT, Talk & Tutorial
		2.4	Socio-economic characteristics, basic data on watersheds.	T1, T2, R1		PPT, Talk & Tutorial

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3	**CO3:** Apply land grading techniques for proper land management. K1&K2	**UNIT – III**				
		3.1	**PRINCIPLES OF EROSION:** Types and causes of erosion, factors affecting erosion,	T1, T2, R1	3	PPT,& Tutorial
		3.2	Estimation of soil loss due to erosion-Universal soil loss equation.	T1, T2, R1	3	PPT, Talk & Tutorial
		3.3	**MEASURES TO CONTROL EROSION:** Contour techniques, Ploughing, furrowing.	T1, T2, R1	3	PPT, Talk & Tutorial
		3.4	Trenching, Bunding, terracing, gully control, check dams, rock-fill dams,	T1, T2, R1	3	PPT, Talk & Tutorial
		3.5	Brushwood dam, Gabion	T1, T2, R1	3	PPT, Talk & Tutorial
4	CO4: Understand the working principles of various hydraulic turbines. K2&K3	**UNIT – IV**				
		4.1	**WATER HARVESTING:** Techniques of rain water harvesting-rain water harvesting from roof top	T1, T2, R1	3	PPT, Talk & Tutorial, Case study
		4.2	Surface flow harvesting, subsurface flow harvesting,	T1, T2, R1	3	PPT, Talk & Tutorial
		4.3	Stop dams, farm ponds and dugout ponds	T1, T2, R1	4	PPT, Talk & Tutorial
		4.4	Percolation tanks.	T1, T2, R1	2	PPT, Talk & Tutorial
5	**CO5:** Suggest suitable harvesting techniques for better watershed management K1&K2	**UNIT – V**				
		5.1	**LAND MANAGEMENT:** Land use and Land capability classification	T1, T2, R1	4	PPT, Talk & Tutorial
		5.2	Management of forest, agricultural, grassland and wild land,	T1, T2, R1	4	PPT, Talk & Tutorial
		5.3	Land grading operation	T1, T2, R1	4	PPT, Talk & Tutorial
		5.4	Reclamation of saline and alkaline soils.	T1, T2, R1	2	PPT, Talk & Tutorial
				Total	70	

TEXT BOOKS:

1. Watershed Management 'by Das MM and M.D Saikia, PHI Learning Pvt. Ltd, 2013.
2. Land and Water Management 'by Murthy.VVN, Kalyani Publications, 2007.
3. Watershed Management 'by Murthy J V S, New Age International Publishers, 2006.

REFERENCE BOOKS:

1. Water Resource Engineering 'by Wurbs R A and James R A, Prentice Hall Publishers, 2002.
2. Watershed Hydrology'by Black P E, Prentice Hall, 1996.

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CE4107	ESTIMATION COSTING AND VALUATION (R20)	IV-I	Civil Engineering	7	A & B

COURSE OUTCOMES:

CO1	Understand the procedure of estimating and apply different methods of building estimates to given plan and section K2&K3
CO2	Prepare the schedule of reinforcement bars and apply different methods in estimating the earthwork of canal works K2&K3.
CO3	Apply different methods in estimating the earthwork of road and canal works and gain knowledge of writing specifications to different works K2&K3
CO4	Prepare rate analysis for different items of work and gain knowledge about tendering process. K2&K4
CO5	Gain knowledge of different methods of valuation and assess the valuation of a building. K2&K3

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
UNIT – I	**PROCEDURE OF ESTIMATING AND METHODS OF BILDING ESTIMATES:**					
1	Understand the procedure of estimating and apply different methods of building estimates to given plan and section K2&K3	1.1	Methods of estimating; Main items of work	T1,T2,R2	1	Chalk & Talk, PPT
		1.2	Deduction for openings; Degree of accuracy; Units of measurement.	T1,T2,R2	2	Chalk & Talk, PPT, Model Demonstration
		1.3	**Methods of building estimates:** Individual wall method	T1,T2,R2	2	Chalk & Talk, PPT, Tutorial
		1.4	Centre line method; Arch masonry calculation	T1,T2,R2	3	PPT, Project based learning
		1.5	Estimate of steps.	T1,T2,R2	2	Chalk & Talk, Active Learning
		1.6	**Estimate of Buildings:** Estimate of residential building; Estimate of a building from line plan.	T1,T2,R1	4	Chalk & Talk, Problem based learning
UNIT – II	**ESTIMATE OF RCC WORKS AND CANAL ESTIMATE:**					
2	Prepare the schedule of reinforcement bars and apply different methods in estimating the earthwork of canal works K2&K3	2.1	Standard hooks and cranks; Estimate of RCC slab	T1,T2,R1	4	Chalk & Talk, PPT, Tutorial
		2.2	RCC beam; and RCC column with foundation.	T1,T2,R1	4	PPT, Project based learning
		2.3	Earthwork in canals– different cases	T1,T2,R2	2	Chalk & Talk, Active Learning
		2.4	Estimate of earthwork in irrigation channels.	T1,T2,R2	5	Chalk & Talk, PPT, NPTEL

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Mid examinations-I						
UNIT – III	**ROAD ESTIMATING AND SPECIFICATIONS:**					
3	Apply different methods in estimating the earthwork of road and canal works and gain knowledge of writing specifications to different works K2&K3	3.1	Estimate of earthwork	T1,T2,R2	2	Chalk & Talk
		3.2	Estimate of pitching of slopes	T1,T2,R2	2	PPT, Tutorial, Active Learning
		3.3	Estimate of earthwork of road from longitudinal sections	T1,T2,R2	4	Chalk & Talk, Active Learning
		3.4	Estimate of earthwork in hill roads	T1,T2,R2	4	Chalk & Talk, PPT, Tutorial
		3.5	Purpose and method of writing specifications; General specifications	T1,T2,R2	2	Chalk & Talk, PPT Tutorial, Active Learning
		3.6	Detailed Specifications for Brick work; R.C.C; Plastering; Mosaic Flooring; R.R.Stone Masonary.	T1,T2,R2	2	PPT, Tutorial, Active Learning, Quiz
UNIT – IV	**ANALYSIS OF RATES, PWD ACCOUNTS AND PROCEDURE OF WORKS:**					
4	Prepare rate analysis for different items of work and gain knowledge about tendering process. K2&K4	4.1	Task or out – turn work; Labour and materials required for different works	T1,T2,R1	2	Chalk & Talk, Student Seminars
		4.2	Rates of materials and labour; Preparing analysis of rates for the following items of work: i) Concrete	T1,T2,R1	2	PPT, Tutorial, Active Learning
		4.3	Preparing analysis of rates for the following items of work: ii) RCC work	T1,T2,R1	2	Chalk & Talk, PPT, Tutorial
		4.4	Preparing analysis of rates for the following items of work: iii) Brick work in foundation and super structure	T1,T2,R1	2	Chalk & Talk, PPT, Tutorial, Web resources
		4.5	Preparing analysis of rates for the following items of work: iv) plastering, v)Flooring,vi)White washing	T1,T2,R1	3	Chalk & Talk, PPT, Tutorial
		4.6	Organization of Engineering department; Work charged establishment	T1,T2,R2	2	PPT, Tutorial, Active Learning
		4.7	Contract; Tender; Tender notice; Tender Schedule; Earnest money; Security money	T1,T2,R2	2	PPT, Tutorial, Active Learning
		4.8	Measurement book; Administrative approval; Technical sanction	T1,T2,R2	2	Chalk & Talk, PPT, Tutorial
		4.9	Plinth area; Floor Area; Carpet area; Approximate Estimate; Plinth area estimate; Revised Estimate; Supplementary estimate.	T1,T2,R2	2	Chalk & Talk, PPT, Tutorial

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UNIT – V VALUATION:						
5	Gain knowledge of different methods of valuation and assess the valuation of a building. K2&K3	5.1	Cost; Price & value; Methods of valuation	T1,T2,R3	2	Chalk & Talk, PPT, Tutorial
		5.2	Out goings; Depreciation	T1,T2,R3	2	PPT, Tutorial, Web resources
		5.3	Methods for Estimating cost depreciation; Valuation of building.	T1,T2,R3	2	Chalk & Talk, PPT, Tutorial
		5.4	**Miscellaneous Topics:** Gross income; Net income; Scrap value; Salvage value; Obsolescence	T1,T2,R3	1	Chalk & Talk, PPT, Tutorial, Web resources
		5.5	Annuity; Capitalized value; Years purchase; Life of structures	T1,T2,R3	2	Chalk & Talk, PPT, Tutorial
		5.6	Sinking fund; Standard rent; Process of fixing standard rent; Mortgage.	T1,T2,R3	2	Chalk & Talk, PPT, Tutorial
Mid examinations-II						
				Total	75	
END EXAMINATIONS						

TEXT BOOKS:

T1. Estimating & Costing in Civil Engineering by B.N. Dutta, UBS Publishers & Distributors, 2010.

T2. Estimation. Costing and Specifications by M. Chakraborthi, Laxmi Publications.

REFERENCE:

R1. Standard Scheduled Of Rates and Standard Data Book By Public Work Department.

R2. IS 1200 (Part 1to XXV-1974) Methods of Measurement of Building And Civil Engineering Works-B.I.S.

R3. Valuation of Real properties by S. C. Rangwala, 8th Edition, Charotar Publishing House, 2011.

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R20CC4117	E&I (R20)	IV-I	CIVIL	5	A&B

COURSE OUTCOMES: Student is able to

CO1 : Outline the concepts of Entrepreneurship.[K2]
CO2 : Create the awareness on creativity and innovation.[K6]
CO3 : Adopt the Entrepreneurship Development programs[K6]
CO4 : Evaluate the project planning and feasibility studies.[K5]
CO5 : Analyze the concept of small and micro enterprises.[K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Outline the concepts of Entrepreneurship.[K2]		**Unit-1.** Entrepreneur And Entrepreneurship			
		1.1	Entrepreneur – Definitions, concept of entrepreneur	T1, R1	10	Chalk & Talk
		1.2	characteristics of entrepreneur, types of entrepreneurs	T1, R1		
		1.3	concept of entrepreneurship, characteristics of entrepreneurship	T1, R1		
		1.4	role of entrepreneurship in economic development	T1,R1		
		1.5	ethics and social responsibilities of an entrepreneur	T1,R1		
		1.6	Financial institutional support to entrepreneurs(IDBI,SISI,DIC,NIESBUD, Commercial banks etc.,	T1,R1		
2	CO2: Create the awareness on creativity and innovation.[K6]		**Unit-2. Creativity And Innovation In Entrepreneurship**			
		2.1	Meaning and concept of creativity - Nature and characteristics of creativity	T1, R1	8	Chalk & Talk
		2.2	Creativity Process- Factors affecting creativity	T1, R1		
		2.3	Meaning and Importance Innovation - Process	T1, R1		
		2.4	Distinguish the Creativity and Innovation.			
	CO3: Adopt the Entrepreneurship Development programs[K6]		**Unit-3. Entrepreneurship Development Programmes**			
		3.1	Designing Appropriate Training Programme to inculcate Entrepreneurial Spirit	T1, R1	10	Chalk & Talk
		3.2	Training for Entrepreneurs, Entrepreneurship Development Programme (EDP)	T1, R1		
		3.3	Need and objectives of EDP's	T1, R1		
		3.4	Phases and evolution on EDP's existing and new Entrepreneurs.	T1, R1		
			MID I EXAMINATION DURING EIGHTH WEEK			

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4	CO4 : Evaluate the project planning and feasibility studies.[K5]	**Unit-4. Project Planning And Feasibility Studies**				
		4.1	Meaning of a project. Project identification – Sources of new Ideas	T2, R2	12	Chalk & Talk
		4.2	Methods of generating ideas, Project selection,	T2, R3		
		4.3	Project Feasibility Study -Project evaluation and Techniques	T2, R3		
		4.4	(PBP, ARR, NPV, IRR & PI).			
5	CO5:Analyze the concept of small and micro enterprises.[K4]	**Unit 5. Small And Micro Enterprises**				
		5.1	Importance, definitions. MSME's Development Act 2006	T2, R2	10	Chalk & Talk
		5.2	policies and their support to MSMEs	T2, R2		
		5.3	Growth of Firm and growth strategies,	T2, R3		
		5.4	Factors inducing growth	T2, R2		
		5.5	Sickness in small business and remedies.	T2, R3		
				Total	50	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1 "Entrepreneurship", Arya Kumar: Pearson, Publishing House, New Delhi, 2012.
T2 "Entrepreneurship', VSP Rao, Kuratko: Cengage Learning, New Delhi,2012
T3 ShoimoMaital, DVR Seshadri, "Innovation Management", Response Books 2007

Reference Books:

R1 "Entrepreneurship Development" B.Janakiram, M Rizwana: Excel Books, ND, 2011
R2 "Entrepreneurship Development", P.C.Shejwalkar Everest Publishing House, ND, 2011
R3 Vinnie Jauhari& Sudhanshu Bhushan, "Innovation Management". Oxford University Press, 2014.

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DEPARTMENT OF EEE
LESSON PLAN- A.Y 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC32MC2	PEHV (R20)	III/I	EEE	2	A

COURSE OUTCOMES: Student is able to
CO1: Interpret the fundamentals of Human values. [K2]
CO2: Analyze the ethical issues and role of engineers in industry. [K4]
CO3: Develop the principles of harmony in value education. [K3]
CO4: List out the duties and rights of engineers. [K4]
CO5: Summarize the engineer's responsibilities towards safety and risk. [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			Unit-1. Human Values			
1	CO1: Interpret the fundamentals of Human values. [K2]	1.1	Ethics, Morals, Values, Integrity,	T1, R1	1	Chalk & Talk
		1.2	Work Ethics- Service Learning	T1, R1	1	Chalk & Talk
		1.3	Civic Virtue- Respect for Others- Living Peacefully	T1, R1	1	Chalk & Talk,PPT
		1.4	Caring- Sharing- Honesty- Courage- Value Time	T1,R1	1	Chalk & Talk
			Cooperation- Commitment – Empathy- Self-Confidence- Spirituality- Character.	T1,R1	1	Chalk & Talk
			Unit-2. Engineering Ethics			
2	CO2: Analyze the ethical issues and role of engineers in industry. [K4]	2.1	Professional Roles to Be Played By Engineer	T1, R1	1	Chalk & Talk
		2.2	Engineers Role As Managers,	T1, R1	1	Chalk & Talk,PPT
		2.3	Consultants And Leaders- Ethical Theories And Its Uses.	T1, R1	2	Chalk & Talk,PPT
			Unit-3. Principles for Harmony			
3	CO3: Develop the principles of harmony in value education. [K3]	3.1	Truthfulness – Customs and Traditions	T1, R1	1	Chalk & Talk
		3.2	Value Education – Human Dignity	T1, R1	1	Chalk & Talk
		3.3	Human Rights –Fundamental Duties	T1, R1	1	Chalk & Talk, Seminars
		3.4	Aspirations and Harmony (I, We & Nature) – Gender Bias – Emotional Intelligence	T1, R1	1	Chalk & Talk
		3.5	Salovey – Mayer Model – Emotional Competencies – Conscientiousness.	T1, R1	2	Chalk & Talk
			MID I EXAMINATION DURING EIGTH WEEK			
4			**Unit-4. Engineers' Duties and Rights**			

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	CO4: List out the duties and rights of engineers. [K4]	4.1	Concept of Duty - Professional Duties – Collegiality	T2, R2	1	Chalk & Talk
		4.2	Techniques for Achieving Collegiality –Senses of Loyalty	T2, R2	1	Chalk & Talk
		4.3	Consensus and Controversy - Professional and Individual Rights	T2, R2	1	Chalk & Talk
		4.4	Confidential and Proprietary Information - Conflict of Interest- Ethical egoism	T2, R2	1	Chalk & Talk, Seminars
		4.5	Collective Bargaining – Confidentiality - Gifts and Bribes	T2, R2	1	Chalk & Talk
		4.6	Problem solving-Occupational Crimes	T2, R2	1	Chalk & Talk
		4.7	Industrial Espionage- Price Fixing- Whistle Blowing	T2, R2	1	Chalk & Talk,PPT
5	CO5: Summarise the engineer's responsibilities towards safety and risk. [K2].	**Unit 5. Engineers' Responsibilities towards Safety and Risk**				
		5.1	Concept of Safety - Safety and Risk	T2, R2	1	Chalk & Talk
		5.2	Types of Risks – Voluntary v/s Involuntary Risk	T2, R2	1	Chalk & Talk, Seminars
		5.3	Consequences - Risk Assessment – Accountability	T2, R2	1	Chalk & Talk
		5.4	Liability - Reversible Effects	T2, R2	1	Chalk & Talk
		5.5	Threshold Levels of Risk - Delayed v/s Immediate Risk	T2, R2	1	Chalk & Talk,PPT
		5.6	Safety and the Engineer	T2, R2	1	Chalk & Talk
		5.7	Designing for Safety – Risk-Benefit Analysis-Accidents.	T2, R2	1	Chalk & Talk,PPT
				Total	30	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1 "Professional Ethics and Morals by Prof. A.R.Arasri, Dharanikota Suyodhana- Maruthi Publications.

T2 Human Values & Professional Ethics by S. B. Gogate, Vikas Publishing House Pvt. Ltd., Noida.

Reference Books:

R1 "Engineering Ethics and Human Values" by M. Govindarajan, S. Natarajan and V.S. Senthil kumar- PHI Learning PVT. Ltd-2009

R2 Professional Ethics by R. Subramanian – Oxford Publications, New Delhi.

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Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

LESSON PLAN

Acadamic year : 2024-2025

CourseCode	Course Title(Regulation)	Year /Sem	Branch	Contact periods/week
R20EE3107	SIGNALS AND SYSTEMS(R20)	III/I	ELECTRICAL & ELECTRONICS ENGINEERING	6

COURSE OUTCOMES:After completion of this course, Students will be able to

CO1: Apply signal operations on basic Signals. [K3]

CO2: Develop Fourier series representation for trigonometric and exponential signals. [K3]

CO3: Translate signals from time-domain to frequency-domain and vice versa. [K2]

CO4: Build the LTI system and responses for different inputs. [K3]

CO5: Evaluate different properties of Sampling. [K5]

Unit No	outcome	Topics/Activity	Ref Text	Total Periods	Delivery Method
		UNIT-1: INTRODUCTION			
1	CO1: Apply signal operations on basic Signals. [K3]	Introduction	T1, T2	1	Chalk & Talk,
		Classification of Signals: Analog, Discrete, Digital, Deterministic & Random,	T1, T2, R2	2	Chalk & Talk, NPTEL
		Periodic & Aperiodic, Even & Odd, Energy & Power signals	T1, T2, R2	2	PPT
		Basic Operations on Signals: Time-Shifting, Time-Scaling	T1, T2, R2	1	Chalk & Talk,
		Time-Reversal, Amplitude Scaling and Signal Addition	T1, T2, R2	1	PPT
		Elementary Signals: Unit Step, Unit Ramp, Exponential function	T1, T2, R2	2	Chalk & Talk,
		Gate function, Triangular function, Sinc function	T1, T2, R2	2	Chalk & Talk,
		Signum function,Unit Parabolic, Impulse, Sinusoidal function	T1, T2, R2	2	Active Learning & Tutorial
		Signal approximation using orthogonal functions	T1	2	Chalk & Talk, NPTEL
		ASSIGNMENT EXAM-1			
		UNIT-II: FOURIER SERIES REPRESENTATION OF SIGNALS			
2	CO2: Develop Fourier series representation for trigonometric and exponential signals. [K3]	Continuous time periodic signals	T1, T2, R2	1	Chalk & Talk,
		Superposition,Time Shifting	T1, T2, R2	1	
		Time Scaling. Time Reversal.	T1	2	Chalk & Talk,
		Conjugation, Multiplication,Parseval's Relations	T1	2	Chalk & Talk, NPTEL
		Dirichlet's conditions	T1	1	Chalk & Talk,
		Trigonometric Fourier Series and Exponential Fourier Series	T1, T2, R2	2	Chalk & Talk,
		Conversion of Exponential Fourier Series from Trigonometric Fourier series & vice versa.	T1	2	Chalk & Talk, NPTEL
		UNIT-III: FOURIER TRANSFORMS			
		Deriving Fourier Transform from Fourier series	T1, R2	1	Chalk & Talk, NPTEL
		Fourier Transform of arbitrary signal	T1, T2, R2	1	Chalk & Talk,

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3	CO3: Translate signals from time-domain to frequency-domain and vice versa. [K2]	Fourier Transform of standard signals	T1, T2, R2	2	Chalk & Talk,
		Fourier Transform of periodic signals	T1, T2, R2	2	Chalk & Talk,
		Linearity, Time shifting, Conjugation and Conjugation symmetry.	T1, T2, R2	2	Chalk & Talk, NPTEL
		Duality, Time Convolution,Parseval's Theorem,Modulation.	T1, T2, R2	2	Chalk & Talk,
		Differentiation,Integration, Time scaling and time reversal, Frequency shifting.	T1, T2, R2	2	Chalk & Talk, NPTEL
		Fourier Transforms involving Impulse function and Signum function	T1, T2, R2	1	Chalk & Talk,

MID I EXAM

UNIT-IV: SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS

4	CO4 Build the system and responses for different inputs [K3]	System and its types: Linear & Non-Linear, Time Variant & Time Invariant, Causal & Non Causal, Static & Dynamic, Stable &	R1	2	PPT, NPTEL
		Impulse response of a linear time invariant (LTI) system and linear time variant (LTV) system	R1	2	Chalk & Talk, NPTEL
		Transfer function of a LTI system	R1	2	Chalk & Talk,
		Filter characteristics of linear systems	R3	2	Chalk & Talk,
		Distortion less transmission through a system	R3	2	Chalk & Talk,
		Signal bandwidth, System bandwidth, Ideal LPF, HPF and BPF and its characteristics	R3	2	PPT
		Relationship between bandwidth and rise time	R3	1	Chalk & Talk,

ASSIGNEMENT EXAM-II

UNIT-V: SAMPLING

5	CO5 Evaluate different properties of Sampling [K4]	Sampling theorem	T1, T2, R2	2	Chalk & Talk, NPTEL
		Types of Sampling: Impulse Sampling, Natural and flattop Sampling	T1, T2, R2	2	PPT
		Reconstruction of signal from its samples	T1, T2, R2	2	Chalk & Talk,
		Effect of under sampling – Aliasing	T1, T2, R2	2	Chalk & Talk,

Text Books:

T1 B.P. Lathi, Signals, Systems and Communications, BS Publications, 2008.

T2 Simon Haykin and VanVeen, Wiley, Signals and Systems, 2nd Edition, 2003.

Reference Books:

R1. A.V. Oppenheim, A.S. Will Sky and S.H. Nawab, Signals and Systems, 2nd Edition, PHI, 2013.

R2. P. Ramesh Babu, Signals and Systems, 3rd Edition, SciTech Publications, 2011.

R3. A.Anand Kumar, Signals and Systems, 3rd Edition, PHI Publications, 2013.

WEB REFERENCES:

1. https://nesoacademy.org/ee/02-signals-and-systems
2. https://onlinecourses.nptel.ac.in/noc21_ee28/preview

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WEB RESOURCES	
1	nptel.ac.in/courses/106106093
2	nptel.ac.in/courses/106104135

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Raghuram Krishnan, Johannes Gehrke, "Database Management Systems", TMH, 3/e, 2008.
T2	Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", PEA, 6/e, 2011.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Silberschatz, Korth, "Database System Concepts", TMH, 6/e, 2010.
R2	C J Date, "Introduction to Database Systems", PEA, 8/e, 2006.
R3	Database System Concepts, Peter ROB, Coronel, Ceneage, 6/2, 2011.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 52260 Department of Electrical and Electronics Engineering

DEPARTMENT OF Electrical and Electronics Engineering
LESSON PLAN
ACADEMIC YEAR 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC1OE10	DATABASE MANAGEMENT SYSTEMS	V	Electrical and Electronics Engineering	5	A

COURSE OUTCOMES:
After completion of this course, the students would be able to

CO1	**Classify** various Data models, Architectures and their implications. [K2]
CO2	**Analyze** DB conceptual design using ER Model. [K4]
CO3	**Interpret** how queries are being processed and executed in RDBMS. [K3]
CO4	**Analyze** various normalization process for database design. [K4]
CO5	**Compare** the various storage and indexing techniques. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			Unit-1. Introduction			
1	CO1 : **Classify** various Data models, Architectures and their implications.	1.1	Database system, Characteristics - Database vs. File System	T1, T2, R1	2	Chalk & Talk,PPT
		1.2	Database Users; Advantages of Data base systems, and Database applications	T1, T1, R1	2	Chalk & Talk
		1.3	Brief introduction of different Data Models	T1, T2, R1	2	Chalk & Talk
		1.4	Three tier schema architecture for data independence; Database system structure	T1, T1,	2	Chalk & Talk
		1.5	Centralized and Client Server architecture for the database.	T1, T2, R1	2	Collaborative Learning
			Unit-2. Entity Relationship Model			
2	CO2 **Analyze** DB conceptual design using ER Model.	2.1	Introduction, Representation of entities, attributes	T1, R2	2	Chalk & Talk
		2.2	entity set, relationship, relationship set	T1, R2	2	PPT
		2.3	Key constraints - Key constraints for Ternary Relationships	T1, T1, R1,R2	2	Collaborative Learning
		2.4	participation constraints, class hierarchies, Aggregation	T1, R2	2	Chalk & Talk,PPT

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		2.5	sub classes, super class	T1, R2	2	Chalk & Talk
		2.6	inheritance, specialization, generalization using ER Diagrams	T1, R2	2	PPT
MID I EXAMINATION DURING SIXTH WEEK						
			Unit-3. SQL			
3	CO3: **Interpret** how queries are being processed and executed in RDBMS.	3.1	Form of a basic SQL Query, Examples of Basic SQL Queries	T1, R2	2	Flipped Learning
		3.2	, data types, different SQL commands nested queries,	T1, R1,R3	2	QUIZ
		3.3	correlated Nested Queries, set-Comparison Operators	T1, R2	2	Chalk & Talk, PPT
		3.4	sub queries, grouping, aggregate operators	T1, R2	2	PPT
		3.4	sub queries, grouping, aggregate operators	T1, R1,R2	2	NPTEL
		3.5	different types of joins, view, relational set operations	T1, R1,R2	2	Chalk & Talk
		3.6	Integrity constraints in SQL - Domain constraints	T1, R1,R2	2	Chalk & Talk,PPT
		3.7	Entity constraints, Referential integrity constraints	T1, R1,R2	2	Chalk & Talk
			Unit-4. Schema Refinement (Normalization)			
4	CO4: **Analyze** various normalization process for database design.	4.1	Problems Caused by Redundancy, Decompositions	T1, R2	2	Chalk & Talk
		4.2	Problems Related to Decomposition, Functional dependency	T1, R2	2	Flipped Learning
		4.3	Properties of Functional dependency	T1, R1	2	Chalk & Talk
		4.4	, Normal forms based on functional dependency - 1NF, 2NF and 3NF.	T1,R2	2	Chalk & Talk,PPT
			Unit 5 Overview of Storage and Indexing			
5	CO5: **Compare** the various storage and indexing techniques.	5.1	Data on External Storage File Organization and Indexing	T1, R2	2	PPT
		5.2	Index data Structures Tree Structured Indexing	T1, R2	2	Chalk & Talk
		5.3	Indexed Sequential Access Methods (ISAM), B+ Trees: A Dynamic index Structure	T1, R2	2	Chalk & Talk, PPT
MID II EXAMINATION DURING EIGHTEENTH WEEK END EXAMINATIONS						

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TEXT BOOKS:

T1.M.L.Soni,P.V.Gupta, U.S.Bhatnagarand A. Chakrabarti -A Text Book on Power System Engineering, Dhanpat Rai & Co. Pvt. Ltd.

T2. Electrical Power Systems by C.L. Wadhwa, New Academic Science Ltd, 2009.

T3. Electric Power Transmission and Distribution by S.Sivanagaraju & S.Satyanarayana, Pearson Education, New Delhi.

REFERENCE BOOKS:

R1. Modern Power System Analysis by D.P.Kothari, I.J. Nagarath ', Tata McGraw-Hill, New Delhi, Fourth Edition, 2013.

R2. The Transmission and Distribution of Electrical Energy by Harry Cotton, H. Barbe, English Universities Press, 1970.

WEB SOURCE REFERENCES:

1	URL:https://www.youtube.com/watch?v=uy9lZCdkQIM&list=PLD4ED2FAF3C155625 & index=1
2	URL:https://www.engineeringbookspdf.com/principles-of-power-systems-v-k-mehta.
3	https://nptel.ac.in/courses/108105104

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

LESSON PLAN

AY 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20EE3103	POWER GENERATION & TRANSMISSION (R20)	V	Electrical & Electronics Engineering	6	A

COURSE OUTCOMES: After completion of this course, Students will be able to

CO 1: **Apply** the knowledge of Power Generation from conventional sources. **[K3]**

CO 2: **Apply** the knowledge of Power Generation from Non - conventional sources. **[K3]**

CO 3: **Derive** the inductance and capacitance for various conductor configurations. **[K3]**

CO 4: **Analyse** the performance of transmission lines based on distance. **[K4]**

CO 5: **Apply** the knowledge on design of transmission lines, insulated Cables and effect of corona. **[K3]**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO 1: Apply** the knowledge of Power Generation from conventional sources. **[K3]**		**UNIT-I: Conventional Sources**			
		1.1	**Hydro Power:** Selection of site-block diagram approach of hydroelectric power	T1,T2	2	Chalk & Talk,
		1.2	**Thermal Power:** Selection of site-general layout of a thermal power plant showing paths of coal-steam-water-air-ash and flue gasses-ash handling system	T1, T2,	2	PPT
		1.3	**Nuclear Power:** Basics of Nuclear Engineering-Layout and subsystems of Nuclear Power Plants	T1, T2,	2	PPT
		1.4	subsystems of Nuclear Power Plants	T1, T2,	2	PPT
		1.5	Working of Nuclear Reactors, Safety measures for Nuclear Power plants	T1, T2	2	Chalk & Talk
2	**CO 2: Apply** the knowledge of Power Generation from Non - conventional sources. **[K3]**		**UNIT-II: Non - Conventional Sources**			
		2.1	**Solar Power:** Basics of solar energy - Solar Radiation at the Earth's surface	T1, T2, R1	2	PPT
		2.2	solar radiation on titled surfaces - Photovoltaic energy conversion	T1, T2, R1	2	PPT
		2.3	**Wind Energy:** Principles of wind power - types of wind turbines - wind turbine operation	T1, T2, R1	2	PPT
		2.4	**Tidal energy:** Principle of Tidal power- Components of Tidal power	T1, T2, R2	2	PPT
		2.5	**Geo thermal Energy:** Nature of Geothermal fields- Geothermal Sources - Potential of Geothermal resources in India	T1, T2, R2	2	Chalk & Talk
		2.6	Potential of Geothermal resources in India.	T1, T2, R1	2	Chalk & Talk
3	**CO 3: Derive** the inductance and		**UNIT–III: Transmission Line Parameters**			
		3.1	Expressions for inductance and capacitance of single phase and 3- phase lines of symmetrical configurations	T2, T3, R2	2	NPTEL

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	capacitance for various conductor configurations. [K3]	3.2	3-phase lines of symmetrical onfigurations	T2, T3, R2	2	NPTEL
		3.3	Expressions for inductance and capacitance of single phase and 3- phase lines of transposed configurations	T2, T3, R2	2	Active Learning
			MID I EXAMINATION DURING EIGHTH WEEK			
		3.4	Concept of self GMD (GMR) and mutual GMD - bundled conductors	T2, T3, R2	2	PPT
		3.5	Effect of ground on capacitance – Numerical Problems.	T2, T3, R2	2	NPTEL
		3.6	Numerical Problems.	T2, T3, R2	2	Chalk & Talk
4	**CO 4: Analyse** the performance of transmission lines based on distance. [K4]		**UNIT - IV: Performance of Transmission Lines**			
		4.1	Representation of lines – Short line: Model, Generalized circuit constants, Voltage regulation and efficiency	T2, T3, R2	2	Chalk & Talk
		4.2	Numerical Problems	T2, T3,	2	Chalk & Talk
		43	Medium length line: Model: Nominal–τ and Nominal–π, generalized circuit constants, Voltage regulation and Efficiency	T2, T3, R2	2	Tutorial
		4.4	Numerical Problems	T2, T3	2	Chalk & Talk
		4.5	Long transmission line –Equivalent–π circuit–Equivalent–τ circuit	T2, T3, R2	2	NPTEL
		4.6	Numerical Problems	T2, T3, R2	2	Tutorial
5	**CO 5: Apply** the knowledge on design of transmission lines, insulated Cables and effect of corona. [K3]		**UNIT - V: Mechanical Design of Transmission Lines and Overhead Line Insulators & Cables**			
		5.1	Introduction – calculation of sag and tension – Effects of wind and ice loading	T2, T3, R2	2	Chalk & Talk
		5.2	Supports at different levels – String chart and sag template - Numerical Problems	T2, T3, R2	2	PPT
		5.3	Types of insulators – Potential distribution over a string of suspension insulators – String Efficiency	T2, T3, R2	2	Active Learning
		5.4	Methods for equalizing the potential – Numerical problems	T2, T3, R2	2	Tutorial
		5.5	Insulating materials – Low voltage and extra high voltage Cables – Electrostatic stress in a single – core cables	T2, T3, R2	2	PPT
		5.6	Grading of cables – Capacitance of insulated cables – Corona – Critical voltage	T2, T3, R2	2	NPTEL
		5.7	Factors affecting corona – Advantages and disadvantages of corona – Radio interference	T2, T3, R2	2	Chalk & Talk
			MID II EXAMINATION DURING SIXTEENTH WEEK			
			END EXAMINATIONS			

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		5.7	Phase displacement control- three Phase -120^0 and 180^0 modes of operation	T1, T2, R2	2	Chalk & Talk, PPT
		5.8	SPWM control	T1, T2, R2	1	PPT & Active Learning
MID II EXAMINATIONS						
END EXAMINATIONS						

Text Books:

T1 Power Electronics – by P.S.Bhimbra, Khanna Publishers.

T2 Power Electronics: Circuits, Devices and Applications – by M. H. Rashid, Prentice Hall of India, 2nd edition, 1998.

Reference Books:

R1 Power Electronics-by P.C.Sen,TataMcGraw-Hill Publishing.

R2 Erickson, Robert W., and Dragan Maksimovic. Fundamentals of Power Electronics. Springer Science & Business Media, 2007.

WEB REFERENCE:

1. https://www.vssut.ac.in/lecture_notes/lecture1424354515.pdf
2. https://mrcet.com/downloads/digital_notes/EEE/31082020/Power%20Electronics.pdf
3. https://nptel.ac.in/courses/108105066

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
LESSON PLAN
Academic year : 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20EE3102	POWER ELECTRONICS (R20)	I	Electrical & Electronics Engineering	5	A

COURSE OUTCOMES:

After completion of this course, Students will be able to

1. **Draw** the characteristics of various power semiconductor devices and **analyze** the operation of silicon-controlled rectifier. [K4]
2. **Analyze** the operation of half-wave and full-wave phase-controlled rectifiers and harmonics in the input current. [K4]
3. **Examine** the operation of three phase full converter and dual converter. [K3]
4. **Examine** the operation of AC voltage controller and single phase cyclo converter. [K3]
5. **Examine** dc-dc converters and **apply** PWM technique for voltage control. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1 **Draw** the characteristics of various power semiconductor devices and **analyze** the operation of silicon-controlled rectifier. [K4]		**UNIT – I: POWER SEMI-CONDUCTOR DEVICES**			
		1.1	Basic theory of operation of SCR- Static characteristics of SCR	T1, T2, R2	2	Chalk & Talk, PPT,
		1.2	Two Transistors analogy -Turn on and Turn off Methods	T1, T2, R2	2	Chalk & Talk, PPT
		1.3	Methods of SCR Triggering	T1, T2, R2	2	PPT, Active Learning
		1.4	Dynamic & Gate Characteristics of SCR	T1	2	PPT & NPTEL
		1.5	Series and Parallel Operation - Snubber circuit	T1, T2, R2	2	Chalk & Talk
		1.6	Characteristics of Power MOSFET and IGBT	T2, R2	2	NPTEL & Virtual Lab
ASSIGNEMENT EXAM-I						
2	CO2 **Analyze** the operation of half-wave and full-wave phase-controlled rectifiers and harmonics in the input current. [K4]		**UNIT - II: Single Phase Converters**			
		2.1	Phase control technique - Natural Commutation	T1, T2, R2	2	Chalk & Talk
		2.2	Single-phase Half-Controlled Converter– R,RL & RLE load	T1, T2, R2	2	Chalk &Talk, Virtual Lab
		2.3	Fully Controlled Converters: Midpoint converter with R-Load (Principle of operation only)	T1, T2, R2	2	PPT & NPTEL
		2.4	Bridge connections with RL, without and with Freewheeling Diode	T1, T2, R2	2	PPT & Tutorial
		2.5	Bridge connections with RLE load without and with Freewheeling Diode	T1, T2, R2	2	PPT & Tutorial
		2.6	Derivation of average load voltage and current		2	Chalk & Talk, Active [illegible]ning

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		UNIT – III: Three Phase Converters				
3	CO3 **Examine** the operation of three phase full converter and dual converter. **[K3]**	3.1	Three phase converters	T1, R2	1	Chalk & Talk, PPT
		3.2	Three pulse and six pulse converters	T1, R2	2	Chalk & Talk, PPT
		3.3	Average load voltage with R and RL loads	T1, T2, R2	2	PPT NPTEL
		3.4	Effect of source inductance (for single phase and converters	T1, T2, R2	2	PPT & Active Learning
		3.5	Effect of source inductance (for three phase converters	T1, R2	2	Chalk & Talk, PPT
		MID I EXAMINATION				
		3.6	Dual converters (both single phase and three phase)	T1, T2,	2	Chalk & Talk, PPT
4		**UNIT – IV: AC Voltage Controllers & Cyclo-Converters**				
	CO4 **Examine** the operation of AC voltage controller and single phase cyclo converter. **[K3]**	4.1	Single Phase AC Voltage Controllers	T1, T2, R2	1	Chalk & Talk, PPT
		4.2	Two SCRs in anti-parallel With R	T1, T2, R2	1	Chalk & Talk, PPT
		4.3	Two SCRs in anti-parallel RL loads	T1, T2, R2	2	Chalk & Talk, PPT
		4.4	Derivation of RMS load voltage, current and power factor – Numerical problems	T1,R2	2	Chalk & Talk, PPT
		4.5	Cyclo-Converters: Single phase	T1,R2	2	Chalk & Talk, PPT
		4.6	Bridge configuration with Resistive and inductive load (Principle of operation only)	T1,R2	2	Chalk & Talk, PPT
		ASSIGNEMENT EXAM-II				
		4.7	Introduction to bidirectional converters	T1, T2, R2	2	Chalk & Talk, Quiz
5		**UNIT – V: DC-DC Converters and DC-AC Converters**				
	CO5 **Examine** dc-dc converters and **apply** PWM technique for voltage control. **[K4]**	5.1	Choppers: Introduction - Operation of Buck Converter -	T1, T2, R2	2	Chalk & Virtual Lab
		5.2	Boost Converter, Buck-Boost Converter	T1, T2, R2	2	Chalk & Virtual Lab
		5.3	Derivation of Output Voltage	T1, T2, R2	1	PPT & Active Learning
		5.4	Current -Duty ratio & Numerical Problems	T1, T2, R2	2	Chalk & Virtual Lab
		5.5	Current Numerical Problems	T1, T2, R2	2	Chalk & Virtual Lab
		5.6	Inverters: Single phase bridge inverter– Unipolar voltage switching and Bipolar voltage switching	T1, T2, R2	2	NPTEL & Tutorial

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ACADEMIC YEAR 2024-2025

S.No.	Year/Sem	Name of the Subject		Name of the Faculty	LP Status
1	III-I	PSWP	Problem Solving With Python	Dr. P. Lakshmanan	Submitted
2		PE	Power Electronics	Mrs. P. Ragava Rani	Submitted
3		PGT	Power Generation & Transmission	Mr. P.D.V.S.K.Kishore	Submitted
4		DBMS	Data Base Management System	Mr. A. Ramesh	Submitted
5		SS	Signals & Systems	Mr. M. B. Narendra	Submitted
6		PEHV	Professional Ethics & Human Values	Ms. T. Swathi	Submitted

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DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINERING
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R20CC4117	E&I (R20)	IV-I	EEE	5	A&B

COURSE OUTCOMES: Student is able to

CO1 : Outline the concepts of Entrepreneurship.[K2]
CO2 : Create the awareness on creativity and innovation.[K6]
CO3 : Adopt the Entrepreneurship Development programs[K6]
CO4 : Evaluate the project planning and feasibility studies.[K5]
CO5 : Analyze the concept of small and micro enterprises.[K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Outline the concepts of Entrepreneurship.[K2]		**Unit-1. Entrepreneur And Entrepreneurship**			
		1.1	Entrepreneur – Definitions, concept of entrepreneur	T1, R1	1	Chalk & Talk
		1.2	characteristics of entrepreneur, types of entrepreneurs	T1, R1	2	Chalk & Talk,PPT
		1.3	concept of entrepreneurship, characteristics of entrepreneurship	T1, R1	2	Chalk & Talk
		1.4	role of entrepreneurship in economic development	T1,R1	1	Chalk & Talk
		1.5	ethics and social responsibilities of an entrepreneur	T1,R1	2	Chalk & Talk,PPT
		1.6	Financial institutional support to entrepreneurs(IDBI,SISI,DIC,NIESBUD, Commercial banks etc.,	T1,R1	2	Chalk & Talk,PPT
2	CO2: Create the awareness on creativity and innovation.[K6]		**Unit-2. Creativity And Innovation In Entrepreneurship**			
		2.1	Meaning and concept of creativity - Nature and characteristics of creativity	T1, R1	2	Chalk & Talk,PPT
		2.2	Creativity Process- Factors affecting creativity	T1, R1	2	Chalk & Talk
		2.3	Meaning and Importance Innovation - Process	T1, R1	2	Chalk & Talk,PPT
		2.4	Distinguish the Creativity and Innovation.	T1, R1	2	Chalk & Talk
3	CO3: Adopt the Entrepreneurship Development programs[K6]		**Unit-3. Entrepreneurship Development Programmes**			
		3.1	Designing Appropriate Training Programme to inculcate Entrepreneurial Spirit	T1, R1	2	Chalk & Talk
		3.2	Training for Entrepreneurs, Entrepreneurship Development Programme (EDP)	T1, R1	2	Chalk & Talk,PPT
		3.3	Need and objectives of EDP's	T1, R1	2	Chalk & Talk
			MID I EXAMINATION			
		3.4	Phases and evolution on EDP's existing and new Entrepreneurs.	T1, R1	2	Chalk & Talk,PPT

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		Unit-4. Project Planning And Feasibility Studies				
	CO4: Evaluate the project planning and feasibility studies.[K5]	4.1	Meaning of a project, Project identification – Sources of new Ideas	T2, R2	3	Chalk & Talk
		4.2	Methods of generating ideas, Project selection,	T2, R2	2	Chalk & Talk,PP
		4.3	Project Feasibility Study -Project evaluation and Techniques	T2, R2	3	Chalk & Talk
		4.4	(PBP, ARR, NPV, IRR & PI).	T2, R2	4	Chalk & Talk
5	CO5:Analyze the concept of small and micro enterprises.[K4]	**Unit 5. Small And Micro Enterprises**				
		5.1	Importance, definitions, MSME's Development Act 2006	T2, R2	2	Chalk & Talk,PPT
		5.2	policies and their support to MSMEs	T2, R2	2	Chalk & Talk
		5.3	Growth of Firm and growth strategies,	T2, R3	2	Chalk & Talk
		5.4	Factors inducing growth	T2, R2	2	Chalk & Talk,PPT
		5.5	Sickness in small business and remedies.	T2, R3	2	Chalk & Talk
				Total	50	
		MID II EXAMINATION DURING SIXTEENTH WEEK				
		END EXAMINATIONS				

Text Books:

T1 "Entrepreneurship", Arya Kumar: Pearson, Publishing House, New Delhi, 2012.
T2 "Entrepreneurship', VSP Rao, Kuratko: Cengage Learning, New Delhi,2012
T3 ShoimoMaital, DVR Seshadri, "Innovation Management", Response Books 2007

Reference Books:

R1 "Entrepreneurship Development" B.Janakiram, M Rizwana: Excel Books, ND, 2011
R2 "Entrepreneurship Development", P.C.Shejwalkar Everest Publishing House, ND, 2011

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3	CO3: **Summarize** the working principles of geothermal, ocean, tidal and wave energy techniques. (K3)	**UNIT–III: Geothermal Energy, Ocean Energy, Tidal and Wave Energy**				
		3.1	Introduction of Geothermal Energy	T1, T2, R1	2	Chalk & Talk
		3.2	Nature of Geothermal fields- Geothermal Sources	T1, T2, R1	2	PPT
		3.3	OTEC- Methods of ocean thermal electric power generation	T1, T2, R1	3	Active Learning
		MID I EXAMINATION DURING EIGHTH WEEK				
		3.4	Open cycle and closed cycle- Principle of Tidal power	T1, T2, R1	3	PPT
		3.5	Components of Tidal power plants- Advantages and Disadvantages of Wave energy, Energy and power from the Waves	T1, T2, R1	3	Student Seminar
4	CO4: **Interpret** the functioning of Thermal Electric Power. (K3)	**UNIT - IV: Thermal Electric Power**				
		4.1	Introduction- Thermo electric power generation	T1, T2, R1	3	Chalk & Talk
		4.2	See-beck, Peltier, Thomson effects	T1, T2, R1	3	Tutorial
		4.3	Thermo electric power generation	T1, T2, R1	3	NPTEL
		4.4	Thermo electric materials- Selection of materials	T1, T2, R1	4	Tutorial
5	CO5: **Analyze** the MHD power generation and its future prospects. (K4)	**UNIT - V: MHD Power Generation**				
		5.1	Introduction- Principle of MHD power generation- MHD Systems	T1, T2, R1	3	Chalk & Talk
		5.2	Open cycle and closed cycle Systems	T1, T2, R1	3	PPT
		5.3	Advantages of MHD Systems	T1, T2, R1	3	Active Learning
		5.4	International Status of MHD power generation and its future prospects.	T1, T2, R1	4	Student Seminar
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	"Non-Conventional Energy Sources" / G.D. Rai/ DhanpatRai and Sons
T2	"Renewable energy resources"/ Tiwari and Ghosal / Narosa

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC4OE03	NON-CONVENTIONAL ENERGY RESOURCES (R20)	VII	Electrical & Electronics Engineering	6	A & B

Course Outcomes:

After completion of this course, Students will be able to

CO1: Illustrate the principles of solar radiation and their applications. (K3)

CO2: Analyze the functioning of basic components of wind energy and the utilization of Biomass in power generation.(K4)

CO3: Summarize the working principles of geothermal, ocean, tidal and wave energy techniques.(K3)

CO4: Interpret the functioning of Thermal Electric Power.(K3)

CO5: Analyze the MHD power generation and its future prospects. (K4)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: **Illustrate** the principles of solar radiation and their applications. (K3)		**UNIT-I: Introduction & Solar Energy**			
		1.1	Introduction to Energy Sources and their availability	T1,T2 R2	3	Chalk & Talk,
		1.2	renewable sources - The solar constant	T1, T2, R3	2	NPTEL
		1.3	Solar Radiation at the Earth's surface	T1, T2, R4	2	PPT
		1.4	instruments for measuring solar radiation - solar radiation on titled surfaces	T1, T2, R4	2	PPT
		1.5	solar ponds-Applications of Solar ponds	T1, T2, R3	2	Chalk & Talk
		1.6	solar heating-Photovoltaic energy conversion	T1, T2, R2	2	PPT
2	CO2: **Analyze** the functioning of basic components of wind energy and the utilization of biomass in power generation. (K4)		**UNIT-II: Wind Energy and Bio-Mass**			
		2.1	Principles of wind energy conversion, Components of WECS	T1, T2, R1	3	Active Learning
		2.2	horizontal and vertical axis windmills	T1, T2, R1	2	PPT
		2.3	Performance characteristics. Bio fuels	T1, T2, R1	2	Chalk & Talk
		2.4	Methods for obtaining energy from Biomass	T1, T2, R1	3	NPTEL
		2.5	Thermal gasification of Biomass	T1, T2, R1	3	PPT

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3	CO3: **Summarize** the working principles of geothermal, ocean, tidal and wave energy techniques. (K3)	**UNIT–III: Geothermal Energy, Ocean Energy, Tidal and Wave Energy**				
		3.1	Introduction of Geothermal Energy	T1, T2, R1	2	Chalk & Talk
		3.2	Nature of Geothermal fields-Geothermal Sources	T1, T2, R1	2	PPT
		3.3	OTEC- Methods of ocean thermal electric power generation	T1, T2, R1	3	Active Learning
		MID I EXAMINATION DURING EIGHTH WEEK				
		3.4	Open cycle and closed cycle- Principle of Tidal power	T1, T2, R1	3	PPT
		3.5	Components of Tidal power plants-Advantages and Disadvantages of Wave energy, Energy and power from the Waves	T1, T2, R1	3	Student Seminar
4	CO4: **Interpret** the functioning of Thermal Electric Power. (K3)	**UNIT - IV: Thermal Electric Power**				
		4.1	Introduction- Thermo electric power generation	T1, T2, R1	3	Chalk & Talk
		4.2	See-beck, Peltier, Thomson effects	T1, T2, R1	3	Tutorial
		4.3	Thermo electric power generation	T1, T2, R1	3	NPTEL
		4.4	Thermo electric materials- Selection of materials	T1, T2, R1	4	Tutorial
5	CO5: **Analyze** the MHD power generation and its future prospects. (K4)	**UNIT - V: MHD Power Generation**				
		5.1	Introduction- Principle of MHD power generation- MHD Systems	T1, T2, R1	3	Chalk & Talk
		5.2	Open cycle and closed cycle Systems	T1, T2, R1	3	PPT
		5.3	Advantages of MHD Systems	T1, T2, R1	3	Active Learning
		5.4	International Status of MHD power generation and its future prospects.	T1, T2, R1	4	Student Seminar
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS	
T	BOOK TITLE/AUTHORS/PUBLISHER
T1	"Non-Conventional Energy Sources" / G.D. Rai/ DhanpatRai and Sons
T2	"Renewable energy resources"/ Tiwari and Ghosal / Narosa

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Text Books:

T1 Ali Keyhani, Mohammad N. Marwali, Min Dai: Integration of Green and Renewable Energy in Electric Power Systems, Wiley

T2 Clark W. Gellings: The Smart Grid: Enabling Energy Efficiency and Demand Response, CRC Press

Reference Books:

R1 Clark W. Gellings: The Smart Grid – Enabling Energy efficiency and demand response, P.E., CRC Press, Taylor & Francis group, First Indian Reprint. 2015.

R2 Lars Torsten Berger, Krzysztof Iniewski,: Smart Grid – Applications, Communications, and Security, WILEY, 2012, Reprint 2015

R3 Cobus Strauss: Practical Electrical Network Automation and Communication Systems, ELSVIER, 2003.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

LESSON PLAN **ACADEMIC YEAR: 2024-25**

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC3OE03	Concept of Smart Grid Technologies (R20)	4-1	EEE	6	B

COURSE OUTCOMES: After completion of this course, the students would be able to

CO1: Analyse the smart grid policies and developments in smart grids. [K4]

CO2: Develop concepts of smart grid technologies in hybrid electrical vehicles etc.[K4]

CO3: Illustrate the different types of smart substations and feeder automation.[K2]

CO4: Analyse micro grids and distributed generation systems.[K4]

CO5: Analyse the effect of power quality in smart grid and to understand latest developments in ICT for smart Grid [K4]

Unit No.	Outcome		Topics/Activity	Ref. Text book	Total Periods	Delivery Method
1	CO 1. **Analyse** the smart grid policies and developments in smart grids. [K4]		**Unit-1: Introduction to Smart Grid**			
		1.1	Evolution of Electric Grid, Concept of Smart Grid, Definitions	T1, R1,R3	2	Chalk & Talk, PPT
		1.2	Need of Smart Grid, Functions of Smart Grid, Opportunities & Barriers of Smart Grid	T1, R1,R3	2	Chalk & Talk
		1.3	Difference between conventional & smart grid	T1, R1,R3	2	Chalk & Talk
		1.4	Concept of Resilient &Self-Healing Grid	T1, R1,R3	2	PPT
		1.5	Present development & International policies on Smart Grid	T1,R1,R3	2	PPT
		1.6	Case study of Smart Grid.	T1, R1,R3	2	PPT
			ASSIGNMENT-1 EXAMINATIONS			
2	CO2. **Develop** concepts of smart grid technologies in hybrid electrical vehicles etc.[K4]		**Unit-2: Smart Grid Technologies: Part 1**			
		2.1	Introduction to Smart Meters, Real Time Prizing,	T2, R1,R3	2	Chalk & Talk, PPT
		2.2	Smart Appliances, Automatic Meter Reading (AMR)	T2, R1,R3	2	PPT
		2.3	Outage Management System(OMS)	T2, R1,R3	2	Chalk & Talk
		2.4	Plug in Hybrid Electric Vehicles(PHEV), Vehicle to Grid	T2, R1,R3	2	NPTEL
		2.5	Smart Sensors, Home & Building Automation	T2, R1,R3	2	Chalk & Talk
		2.6	Phase Shifting Transformers.	T2, R1,R3	2	Chalk & Talk
3	CO 3. **Illustrate** the different types of smart substations and feeder automation.[K2]		**Unit-3: Smart Grid Technologies: Part 2**			
		3.1	Smart Substations, Substation Automation	T1, R1,R2	2	PPT
		3.2	Feeder Automation. Geographic Information System (GIS)	T1, R1,R2	2	Chalk & Talk
		3.3	Intelligent Electronic Devices (IED) & their		2	PPT, web

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			application for monitoring & protection, Smart storage like Battery	R1,R2		resource
			MID I EXAMINATIONS			
		3.4	SMES, Pumped Hydro, Compressed Air Energy Storage	T1, R1,R2	2	Chalk & Talk
		3.5	Wide Area Measurement System(WAMS)	T1, R1,R2	2	Flipped learning
		3.6	Phase Measurement Unit(PMU)	T1, R1,R2	2	PPT
4	CO 4. **Analyse** micro grids and distributed generation systems.[K4]		**Unit-4: Micro grids and Distributed Energy Resources**			
		4.1	Concept of micro grid, need & applications of Microgrid	T1, R1,R3	2	Chalk & Talk
		4.2	Formation of Microgrid, Issues of Inter connection,	T1, R1,R3	2	PPT
		4.3	Protection & control of Microgrid.	T1, R1,R3	2	Chalk & Talk
			ASSIGNMENT-2 EXAMINATIONS			
		4.4	Plastic & Organic solar cells, thin film solar cells,	T1, R1,R3	2	PPT
		4.5	Variable speed wind generators, fuel cells, micro turbines,	T1, R1,R3	2	Web Resources
		4.6	Captive power plants, Integration of renewable energy sources.	T1, R1,R3	2	Web Resources
5	CO 5. **Analyse** the effect of power quality in smart grid and to understand latest developments in ICT for smart grid.[K4]		**Unit 5: Power Quality Management in Smart Grid**			
		5.1	Power Quality & EMC in Smart Grid	T2, R1,R2	2	PPT
		5.2	Power Quality issues of Grid connected Renewable Energy Sources	T2, R1,R2	2	Web Resources
		5.3	Power Quality Conditioners for Smart Grid	T2, R1,R2	2	Chalk & Talk
		5.4	Web based Power Quality monitoring, Power Quality Audit	T2, R1,R2	2	Chalk & Talk, PPT
		5.5	Information and Communicaion Technology for Smart Grid Advanced Metering Infrastructure (AMI)	T2, R1,R2	2	PPT
		5.6	Home Area Network (HAN), Neighborhood Area Network (NAN), Wide Area Network (WAN).	T2, R1,R2	2	PPT
				Total	**60**	
			MID II EXAMINATIONS			
			END EXAMINATIONS			

Web Resources:

https://www.sciencedirect.com/science/article/abs/pii/S0360319906004113
https://www.sciencedirect.com/topics/engineering/micro-turbine
https://www.powerup.at/knowledge/captive-power-plants/captive-power-plant/
https://clouglobal.com/the-effects-of-renewable-energy-on-power-quality-in-the-grid/

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		5.4	Static distance relay	T1, T2, R2	2	Chalk & Talk
		5.5	Microprocessor based digital relays	T1, T2, R2	2	Chalk & Talk
		Total hours			**62**	
MID II EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS:

T1 Badri Ram, D. N Viswakarma, "Power System Protection and Switchgear", MH Publications, 2011

T2. "Sunil S Rao", "Switchgear and Protection", Khanna Publishers, 2008.

REFERENCE BOOKS:

R1."Paithankar and S. R. Bhide", "Fundamentals of Power System Protection", PHI, 2003.

R2. "C R Mason", Art & Science of Protective Relaying – Wiley Eastern Ltd, 1966.

R3. "C. L. Wadhwa", "Electrical Power Systems", New Age international (P) Limited, Publishers,6th Edition 2007.

WEB REFERENCES:

1. https://circuitglobe.com/circuit-breaker.html
2. https://www.machinedesign.com/automation-iiot/batteries-power-supplies/article/21832512/thermalmagnetic-circuit-breakers
3. https://www.electricaltechnology.org/2020/10/generator-protection-faults-protection-devices.html
4. https://www.electrical4u.com/busbar-protection/
5. https://archive.nptel.ac.in/courses/108/105/108105167/

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

LESSON PLAN

ACADEMIC YEAR 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20EE4111	**SWITCHGEAR & PROTECTION** (R20)	IV/I	Electrical & Electronics Engineering	6	A & B

COURSE OUTCOMES: Upon completion of the course, the student will be able to,

CO 1: Estimate the principles of arc interruption for application to high voltage circuit breakers of air, oil, vacuum, SF6 gas type. **(k3)**

CO 2: Ability to know the working principle and constructional features of different types ofelectromagnetic protective relays. **(k3)**

CO 3: Estimate the type of faults that is observed to occur in high power generator and transformersand protective schemes used for all protections. (K3)

CO 4: Choose the Protective Schemes to various types of feeders and bus bar protection. **(k3)**

CO 5: Sketch the different types of static over current relays used in power system, **(k3**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO 1:** **Estimate** the principles of arc interruption for application to high voltage circuit breakers of air, oil, vacuum, SF6 gas type. (k3)		**UNIT-I: Circuit Breakers**			
		1.1	Miniature Circuit Breaker (MCB)	T1,T2 R3	1	Chalk & Talk
		1.2	Elementary principles of arc interruption	T1, T2, R2	2	Chalk & Talk
		1.3	Restrike Voltage and Recovery voltages– Restrike phenomenon	T1, T2, R3	2	Chalk & Talk
		1.4	Average and Max. RRRV– Current chopping and Resistance switching	T1,R2	2	Chalk & Talk
		1.5	Introduction to oil circuit breakers	T2,R1, R3	2	Quiz, PPT
		1.6	Description and operation of Air Blast– Vacuum and SF6 circuit breakers	T1, T2, R2	2	PPT
		1.7	CB ratings and specifications– Auto reclosing.	T1, T2 R3	2	Chalk & Talk
			ASSIGNMENT I EXMINATIONS			
2	**CO 2:** Ability to know the working principle and constructional features of different Types of electromagnetic protective relays. (k3)		**UNIT-II: Electromagnetic Protection**			
		2.1	Principle of operation and construction of attracted armature– Balanced beam relays.	T1, T2, R3	2	Chalk & Talk
		2.2	induction disc and induction cup relays	T1, T2, R1	2	Chalk & Talk
		2.3	Relays classification – Instantaneous – DMT and IDMT types	T1, T2, R2	2	PPT
		2.4	Applications of relays: O current/under voltage relays	T1, T2, R1	2	Seminars

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		2.5	Directional relays	T2, R3	1	Chalk & Talk, PPT
		2.6	Differential relays and percentage differential relays	T1, T2, R1	2	PPT
		2.7	Universal torque equation	T2, R3	1	Chalk & Talk
		2.8	Distance relays: Impedance– Reactance– Mho and offset mho relays	T1, T2, R2	2	PPT
		2.9	Characteristics of distance relays and comparison.	T1, T2, R1	1	Chalk & Talk
3	**CO3:** Estimate the type of faults that is observed to occur in high power generator and transformers and protective schemes used for all protections. (K3)	**UNIT–III: Generator Protection**				
		3.1	Protection of generators against stator faults	T1, T2, R2	2	NPTEL
		3.2	Protection of generators against rotor faults and abnormal conditions	T1, T2, R1	2	Active Learning
		3.3	Restricted earth fault and inter turn fault protection	T1, T2, R2	2	NPTEL Chalk & Talk
		3.4	Numerical examples	T2, R3	2	Chalk & Talk
		MID I EXAMINATIONS				
		3.5	Transformer Protection: Protection of transformers: Percentage differential protection	T1, T2, R2	2	PPT
		3.6	Design of CT's ratio	T1, T2, R3	2	Chalk & Talk
		3.7	Buchholz relay protection– Numerical examples.	T1, T2, R2	2	Chalk & Talk
4	**CO4:** Choose the Protective Schemes to various types of feeders and bus bar protection. (k3)	**UNIT - IV: Feeder and Bus bar Protection**				
		4.1	Protection of lines: Over current	T1, T2, R1	2	Chalk & Talk
		4.2	Carrier current	T1, T2, R2	2	Tutorial
		ASSIGNMENT II EXAMINATIONS				
		4.3	Three zone distance relay using impedancerelays	T1, T2, R2	2	Chalk & Talk
		4.4	Translay relay Protection of bus bars	T1, T2, R3	2	NPTEL
		4.5	Differential protection	T1, T2, R2	2	Tutorial, Chalk & Talk
5	**CO5:** Sketch the different types of static over current relays used in power system, (k3)	**UNIT - V: Static and Digital Relays**				
		5.1	Static relays	T1, T2, R3	2	Chalk & Talk
		5.2	Static relay components	T1, T2, R2	2	PPT
		5.3	Static over current relay	T1, T2,	2	Active Learning

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			different types of compensating equipment for transmission systems	R2		
		5.3	Load compensation – Specifications of load compensator	T2, T1, R2	2	Active Learning
			Uncompensated and compensated transmission lines	T2, T1, R2	1	Chalk & Talk
		5.4	Shunt and series compensation	T2, T1, R3	2	Chalk & Talk Tutorial
		5.5	Need for FACTS controllers.	T2, T1, R2	2	PPT
			Total Classes		60	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS:

1. Electric Energy systems Theory – by O.I.Elgerd, Tata McGraw–hill Publishing Company Ltd.,Second edition.
2. Modern Power System Analysis – by I.J.Nagrath & D.P.Kothari Tata McGraw Hill Publishing Company Ltd, 2nd edition.

REFERENCE BOOKS:

1. Power System Analysis and Design by J.Duncan Glover and M.S.Sarma., Thompson, 3rd Edition.
2. Power System Analysis by Grainger and Stevenson, Tata McGraw Hill.
3. Power System Analysis by Hadi Saadat – TMH Edition.
4. Power System Operation and Control by S.Sivanagaraju & G.Sreenivasan, Pearson.

WEB SOURCES

1.https://www.youtube.com/watch?v=JRbk0_Klhr4/Prof. D.P.Kothari-IIT D
2.https://www.youtube.com/watch?v=iSVfsZ3P0cY/ Prof. D.P.Kothari-IIT D
3.https://www.youtube.com/watch?v=8n8ZNeQIldw / Prof. D.P.Kothari-IIT D
4.https://www.youtube.com/watch?v=BzFAmmmiEGw / Prof. M.L.Kothari-IIT D
5.https://www.youtube.com/watch?v=fK_j_3ZJwuk/ Prof. D.P.Kothari-IIT D
6. https://archive.nptel.ac.in/courses/108/101/108101040/

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
LESSON PLAN(A.Y:2024-2025)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20EE4109	POWER SYSTEM OPERATION AND CONTROL (R20)	IV/I	Electrical & Electronics Engineering	6	A & B

COURSE OUTCOMES: Upon completion of the course, the student will be able to,
CO1: Analyze the economic operation of power systems. **(K4)**
CO2: Solve unit commitment problems. **(K3)**
CO3: Model speed governing system, turbine and generator. **(K3)**
CO4: Develop the Block Diagram of Load frequency control of two area system. **(K3)**
CO5: Illustrate the compensation in power systems. **(K2)**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1:Analyze** the economic operation of power systems. **(K4)**		**UNIT-I: Economic Operation of Power Systems**			
		1.1	Optimal operation of Generators in Thermal power stations – Heat rate curve – Cost Curve	T1,T2 R3	2	Chalk & Talk, PPT
			Heat rate curve – Cost Curve	T1,T2 R3	1	Chalk & Talk
		1.2	Incremental fuel and Production costs	T1, T2, R2	2	PPT
			Input, output characteristics	T1, T2, R2	1	Chalk & Talk
		1.3	Optimum generation allocation with line losses neglected	T1, T2, R3	3	Chalk & Talk,
		1.4	Optimum generation allocation including the effect of transmission line losses –	T1, T2 R3	2	Chalk & Talk
			Loss Coefficients – General transmission line loss formula.	T1, T2 R3	1	Chalk & Talk
	Assignment Test-1					
2	**CO2: Solve unit** commitment problems. **(K3)**		**UNIT-II: Hydrothermal Scheduling& Unit Commitment**			
		2.1	Optimal scheduling of Hydrothermal System	T1, T2, R3	2	PPT,NPTEL
			Hydroelectric power plant models – Scheduling problems	T1, T2, R3	1	Chalk & Talk
		2.2	Short term hydrothermal scheduling problem	T1, T2, R1	3	Chalk & Talk PPT
		2.3	Optimal unit commitment problem	T1, T2, R2	2	Chalk & Talk

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			Need for unit commitment – Constraints in unit commitment	T1, T2, R2	1	Chalk & Talk
		2.4	Cost function formulation – Solution methods	T1, T2, R1	2	Chalk & Talk
			Priority ordering – Dynamic programming	T1, T2, R1	1	Chalk & Talk
3	**CO3: Model** speed governing system, turbine and generator. **(K3)**	**UNIT-III: Load Frequency Control-I**				
		3.1	Speed governing system - Mathematical modelling of speed governing system	T2, T1, R2	2	NPTEL, Tutorial
			Modelling of steam turbine – Generator-Load Model.	T2, T1, R2	1	Chalk & Talk
		3.2	Necessity of keeping frequency constant	T2, T1, R1	1	Active Learning
			Definitions of Control area – Single area control system	T2, T1, R1	2	Chalk & Talk, PPT
		MID I EXAMINATION DURING EIGHTH WEEK				
		3.3	Block diagram representation of an isolated power system	T2, T1, R2	2	PPT NPTEL
			Steady state analysis – Dynamic response – Uncontrolled case.	T2, T1, R2	1	Chalk & Talk, PPT
		3.4	Proportional plus Integral control of single area and its block diagram representation –	T2, T1, R2	2	Chalk & Talk, PPT
			Steady state response.	T2, T1, R2	1	Chalk & Talk,
4	**CO 4: Develop** the Block Diagram of Load frequency control of two area system. **(K3)**	**UNIT-IV: Load Frequency Control-II**				
		4.1	Block diagram development of Load Frequency Control of two area system-	T2, T1, R1	3	Chalk & Talk
		4.2	Uncontrolled case and controlled case.	T2, T1, R2	3	Chalk & Talk
		4.3	Tie-line bias control.	T2, T1, R3	3	PPT& NPTEL
		4.4	Load Frequency Control	T2, T1, R2	2	Tutorial
			Economic dispatch control	T2, T1, R2	1	Chalk & Talk
5	**CO 5: Illustrate** the compensation in power systems. **(K2)**	**UNIT-V: Compensation in Power Systems**				
		5.1	Overview of Reactive Power control	T2, T1, R3	2	Chalk & Talk
			Reactive Power compensation in transmission systems	T2, T1, R3	1	Chalk & Talk
		5.2	Advantages and disadvantages of	T2, T1,	2	PPT

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Text Books:

T1 "Understanding FACTS" N.G.Hingorani and L.Guygi, IEEE Press.Indian Edition is Available:—Standard Publications, 2001.

Reference Books:

R1 Flexible Ac Transmission System (FACTS)" Edited by Yong Hue Song and Allan T Johns, Institution of Electrical Engineers, London.

R2 Thyristor-based FACTS Controllers for Electrical Transmission Systems, by R.Mohan Mathur and Rajiv k.Varma, Wiley.

WEB REFERENCES:

1. https://nptel.ac.in/courses/108107114
2. https://vemu.org/uploads/lecture_notes/03_01_2020_358499686.pdf
3. https://www.iare.ac.in/sites/default/files/IARE_FACTS_LN.pdf

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20EE4104	FLEXIBLE AC TRANSMISSION SYSTEMS (R20)	I	Electrical & Electronics Engineering	6	A&B

COURSE OUTCOMES:

After completion of this course student will be able to

CO1: Analyze the power flow control in transmission lines using facts controllers. **[K4]**
CO2: Explain the operation and control of voltage and current source converter. **[K2]**
CO3: Analyze method of shunt compensation using static VAR compensators. **[K4]**
CO4: Evaluate different methods of compensations using series compensators. **[K5]**
CO5: Apply unified power flow controller (UPFC) on transmission systems. **[K3]**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1 **Analyze** the power flow control in transmission lines using facts controllers. **[K4]**		**UNIT – I: Introduction to FACTS**			
		1.1	Power flow in an AC System – Loading capability limits	T1, R2	2	Chalk & Talk, PPT
		1.2	Dynamic stability considerations	T1, R2	2	Chalk & Talk, PPT
		1.3	Importance of controllable parameters	T1, R1	2	PPT, Active Learning
		1.4	Basic types of FACTS controllers – Benefits from FACTS controllers	T1	3	PPT & NPTEL
		1.5	Requirements and characteristics of high power devices	T1, R2	2	Chalk & Talk, PPT
		1.6	Voltage and current rating – Losses and speed of switching.	T1, R2	2	PPT & NPTEL
	ASSIGNMENT EXAM-I					
2	CO2 **Explain** the operation and control of voltage and current source converter. **[K4]**		**UNIT - II: Voltage source and Current source converters**			
		2.1	Concept of voltage source converter(VSC)	T1, R2	2	PPT & NPTEL
		2.2	Single phase bridge converter – Square–wave voltage harmonics for a single–phase bridge converter	T1, R2	2	Chalk &Talk, PPT
		2.3	Three–phase full wave bridge converter	T1, R1	3	Chalk &Talk & NPTEL
		2.4	Three–phase current source converter	T1, R1	2	PPT & Tutorial

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		2.5	Comparison of current source converter with voltage source converter.	T1	3	Chalk & Talk, Active Learning
	UNIT – III: Shunt Compensators–1					
3	CO3 **Analyze** method of shunt compensation using static VAR compensators. **[K4]**	3.1	Objectives of shunt compensation	T1, R2	2	Chalk & Talk, PPT
		3.2	Mid–point voltage regulation for line segmentation	T1, R2	4	PPT & NPTEL, Web Resources
		3.3	End of line voltage support to prevent voltage instability	T1, R2	4	PPT & Active Learning
	MID I EXAMINATION					
		3.4	Improvement of transient stability – Power oscillation damping.	T1	4	Chalk & Talk, PPT
	UNIT – IV: Shunt Compensators–2					
4	CO4 **Evaluate** different methods of compensations using series compensators. **[K5]**	4.1	Thyristor Switched Capacitor (TSC) – Thyristor Controlled Reactor (TCR)	T1, R2	3	Chalk & Talk, PPT
		4.2	Static VAR compensator (SVC) and Static Compensator (STATCOM)	T1,R2	3	PPT & Active Learning
		4.3	The regulation and slope transfer function and dynamic performance	T1,R2	3	PPT & Active Learning
	ASSIGNMENT EXAM-II					
		4.4	Transient stability enhancement and power oscillation damping	T1, R2	3	Chalk & Talk, Quiz
		4.5	Operating point control and summary of compensation control.	T1, R2	3	Chalk & Talk, PPT
	UNIT – V: Series Compensators & Combined Controllers					
5	CO5 **Apply** unified power flow controller (UPFC) on transmission systems. **[K3]**	5.1	Static series compensators: Concept of series capacitive compensation	T1, R2	3	Chalk & Talk, Web Resources
		5.2	Improvement of transient stability – Power oscillation damping – Functional requirements	T1, R2	3	Chalk &Talk & Active Learning
		5.3	Thyristor Switched Series Capacitor (TSSC) and Thyristor Controlled Series Capacitor (TCSC)	T1, R2	3	NPTEL & Tutorial
		5.4	Schematic and basic operating principles of Unified Power Flow Controller (UPFC).	T1, R2	3	Chalk &Talk & NPTEL
			Total hours		63	
	MID II EXAMINATIONS					
	END EXAMINATIONS					

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING COLLEGE

ACADEMIC YEAR 2024-2025

S.No.	Year/Sem	Name of the Subject		Name of the Faculty	LP Status
1	IV-I	FACTS	Flexible AC Transmission Systems	Mr. P.D.V.S.K.Kisore	Submitted
2		PSOC	Power System Operation and Control	Mr. Sk. Karimula	Submitted
3		SGP	Switchgear and Protection	Mrs. P. Ragava Rani	Submitted
4		CSGT	Concept of Smart Grid Technology	Dr. Sk. Md. Shareef	Submitted
				Mr. M. Chandra Sekhar	Submitted
5		NCER	Non-Conventional Energy Resources	Mr. G. Nagaraju	Submitted
6		E&IE	Entrepreneurship & Innovation	Mr. P. Venkateswara Rao	Not Submitted

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections	
:R20CC2OE03	HYBRID ELECTRIC VEHICLES	III/II	Electrical & Electronics Engineering	6	A	

COURSE OUTCOMES: Upon completion of the course, the student will be able to,

CO 1: **Analyze** the behavior of an electrical vehicles. [K4]
CO 2: **Measure** the performance quantities such as Capacity, and Properties of Batteries. [K3]
CO 3: **Know** the different ratings of DC and AC Electrical Machines. [K3]
CO 4: **Analyze** the importance of components of Electric Vehicle Drive Train. [K4]
CO 5: **Analyze** the different types of HEV. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1: Analyze** the behavior of an electrical vehicles. [K4]		**UNIT-I: Electric Vehicles**			
		1.1	Introduction— Components	T1,T2 R3	2	Chalk & Talk,
		1.2	Vehicle mechanics	T1, T2, R2	2	PPT
		1.3	Roadway fundamentals	T1, T2, R3	1	Chalk & Talk
		1.4	Vehicle kinetics	T1, T2 R3	2	Chalk & Talk
		1.5	Dynamics of vehicle motion	T1, T2 R2	2	Chalk & Talk
		1.6	Propulsion System Design	T1, T2 R1	2	Chalk & Talk
2	**CO2:Measure** the performance quantities such as Capacity, and Properties of Batteries. [K3]		**UNIT-II: Battery**			
		2.1	Basics – Types	T1, T2, R3	2	PPT
		2.2	Parameters – Capacity	T1, T2, R1	2	PPT
		2.3	Discharge rate - State of charge	T1, T2, R2	2	Chalk & Talk
		2.4	state of Discharge - Depth of Discharge	T1, T2, R1	2	Chalk & Talk
		2.5	Technical characteristics	T1, T2, R1	1	Chalk & Talk
		2.6	Battery pack Design	T1, T2, R2	3	Chalk & Talk
		2.7	Properties of Batteries	T1, T2, R1	2	Chalk & Talk
3	**CO3: Know** the different ratings of DC and AC Electrical Machines. [K3]		**UNIT–III: DC & AC Electrical Machines**			
		3.1	Motor and Engine rating – Requirements	T2, T1, R2	2	PPT
		3.2	DC machines	T2, T1, R1	1	Tutorial
		3.3	Three phase A/c machines - Induction machines	T2, T1, R1	2	Chalk & Talk
			MID I EXAMINATION DURING EIGHTH WEEK			

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		3.4	Permanent magnet machines	T2, T1, R2	3	PPT
		3.5	Switched reluctance machines	T2, T1, R2	2	PPT
4	CO 4: **Analyze** the importance of components of Electric Vehicle Drive Train. [K4]	**UNIT - IV: Electric Vehicle Drive Train**				
		4.1	Transmission configuration-Components-	T2, T1, R1	2	Chalk & Talk
		4.2	Gears-Differential-Clutch	T2, T1, R2	3	Tutorial
		4.3	Brakes regenerative Braking	T2, T1, R2	3	NPTEL
		4.4	Motor sizing	T2, T1, R2	2	Tutorial
5	CO 5: **Analyze** the different types of HEV. [K4]	**UNIT - V: Hybrid Electric Vehicles**				
		5.1	Electrical vehicles types	T2, T1, R3	3	Chalk & Talk
		5.2	Series-Design	T2, T1, R2	2	PPT
		5.3	Parallel and series- Design	T2, T1, R2	3	PPT
		5.4	Parallel configuration – Design	T2, T1, R2	1	Tutorial
		5.5	Drive train	T2, T1, R2	2	PPT
		5.6	Sizing of components	T2, T1, R1	3	Chalk & Talk
		5.7	Scenario of HEV in Indian Market	T2, T1, R2	2	Chalk & Talk
MID II EXAMINATION DURING SIXTEENTH WEEK				**TOTAL**	**61**	
END EXAMINATIONS						

TEXT BOOKS:

T1 James Larminie, "Electric Vehicle Technology Explained", John Wiley & Sons, 2003

T2. Iqbal Hussain, "Electric & Hybrid Vehicles – Design Fundamentals", Second Edition, CRC Press, 2011.

REFERENCE BOOKS:

R1. Sandeep Dhameja, "Electric Vehicle Battery Systems", Newnes, 2000.

R2. Mehrdad Ehsani, Yimin Gao, Ali Emadi, "Modern Electric, Hybrid Electric, and Fuel Cell Vehicles: Fundamentals", CRC Press, 2010

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
LESSON PLAN
ACADEMIC YEAR: 2024 - 2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20EE3205	ELECTRICAL DRIVES	III-II	Electrical and Electronics Engineering	4	A

COURSE OUTCOMES: Students are able to

SNO	Course Outcome Statement
CO1	**Know** about the fundamentals of electric drive and different electric braking methods. [K3]
CO2	**Operation** of single-phase controlled converter fed dc motors and Analyse the steady state behavior of DC motor drive.[K4]
CO3	**Apply** the knowledge of choppers for speed control of DC Motors. [K3]
CO4	**Know** the analysis of speed control of induction motor with variable voltage and v/f Control. [K4]
CO5	**Know** the analysis of speed control mechanism of synchronous motors. [K4]

Unit No	Outcome	Topics/Activity		Text book	Total Periods	Delivery Method
1	**CO1:** **Know** about the fundamentals of electric drive and different electric braking methods. [K3]	**Fundamentals of Electric Drives**				
		1.1	Electric drive	T2,R1	1	Chalk & Talk
		1.2	Fundamental torque equation	T2,R1	1	Chalk & Talk
		1.3	Load torque components	T1, T2,R1	2	Chalk & Talk
		1.4	Nature and classification of load torques	T1, T2 R2	2	Chalk & Talk
		1.5	Steady state stability	T1, T2, R1	2	NPTEL
		1.6	Four quadrant operation of drive (hoist control)	T1, R2	2	Chalk & Talk
		1.7	Braking methods: Dynamic – Plugging – Regenerative methods	T1, R1	2	PPT
		1.8	Typical load torque Characteristics	T1, R2	2	Chalk & Talk
		Assignment Exam – I				
2	**CO2:** **Operation** of single-phase controlled converter fed	**Controlled Converter Fed DC Motor Drives**				
		2.1	1-phase half controlled converter fed separately and self-excited DC motor drive	T1, R2,R1	1	Chalk & Talk
		2.2	1-phase Fully controlled converter fed separately and self-excited DC motor drive	T2,R2	2	Chalk & Talk
		2.3	Output voltage and current waveforms	T2, R2	2	Students seminars

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	dc motors and Analyse the steady state Behavior of DC motor drive. [K4]	2.4	Speed-torque expressions	T1, T2,R2	2	NPTEL
		2.5	Speed-torque characteristics	T1, T2, R2	2	Active learning
		2.6	Principle of operation of dual converters	T2, R2	1	Chalk & Talk
		2.7	dual converter fed DC motor drives	T2,R1	2	PPT
		2.8	Numerical	T2, R2	1	Chalk & Talk
3	**CO 3:** **Apply** the knowledge of choppers for speed control of DC Motors. [K3]	**DC–DC Converters Fed DC Motor Drives:**				
		3.1	Single quadrant – Two quadrant and four quadrant DC-DC converters	T2,T1, R2	2	Chalk & Talk
		3.2	DC-DC converter fed separately excited Motors	T,T2, R2	2	Chalk & Talk
		3.3	DC-DC converter fed Self excited Motors	T1, R2	1	Tutorials
		3.4	Continuous current operation	T1, T2,R2	2	Web resources
	MID I EXAMINATION					
	CO 3: **Apply** the knowledge of choppers for speed control of DC Motors. [K3]	3.5	Output voltage and current waveforms	T1, R1	2	PPT
		3.6	Speed–torque expressions Speed–torque characteristics	T1, R1	2	PPT,quiz
		3.7	Four quadrant operation	T1,T2	1	Students seminars
		3.8	Closed loop operation (qualitative treatment only).	T1, R1	2	PPT
4	**CO4:** **Know** the analysis of speed control of induction motor with variable voltage and v/f Control. [K4]	**Control of 3-phase Induction motor Drive**				
		4.1	Stator voltage control using 3-phase AC voltage regulators	T1,T2, R2	2	Chalk & Talk
		4.2	Waveforms –Speed torque Characteristics	T2,R1	2	Chalk & Talk
		4.3	Variable Voltage Variable Frequency control of induction motor by PWM voltage source inverter	T2,R1	2	Chalk & Talk
	Assignment Exam - II					
	CO4: **Know** the analysis of speed control of induction motor with variable voltage and v/f Control. [K4]	4.4	Closed loop v/f control of induction motor drives (qualitative treatment only).	T1, T2,R2	2	PPT,Quiz
		4.5	Static rotor resistance control – Slip power recovery schemes	T2,R1	2	Chalk & Talk
		4.6	Static Scherbius drive – Static Kramer drive	T2,R2	2	Chalk & Talk
		4.7	Performance and speed torque characteristics – Advantages – Applications	T2,R2	2	Chalk & Talk
5	**CO5:** **Know** the analysis of speed control mechanism of synchronous motors. [K4]	**Synchronous Motor Drives**				
		5.1	Separate control of synchronous motor	T1,T2, R2	2	Chalk & Talk
		5.2	self-control of synchronous motor employing load commutated thyristor inverter	T1, R2	2	Chalk & Talk

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TEXT BOOKS:

T1 Modern Power system analysis-I.J.Nagrath and D.P.Kothari- TMH, 2nd edition

T2. Computer methods in power systems analysis-Glenn Stagg, Ahmed H.EI. Abiad- McGraw-Hill International Editions.

REFERENCE BOOKS:

R1. Power system analysis-Grainger and Stevenson, Tata Mc. Graw-Hill.

R2. Power system analysis-A.R.Bergen, PHI

R3. Power system analysis-Hadi saadat- TMH edition.

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
LESSON PLAN

ACADEMIC YEAR: 2024 - 2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20EE3203	MEASUREMENTS AND INSTRUMENTATION (R20)	II	Electrical & Electronics Engineering	4	-

COURSE OUTCOMES:
Upon successful completion of the course, the students will be able to:
CO1: Understand the Basic functional elements of instrumentation. **[K2]**
CO2: Understand and **Applying** the concepts of Fundamentals of electrical and electronic instruments. **[K3]**
CO3: Analyze the compare between various measurements techniques. **[K4]**
CO4: Understand the Various storage and display devices. **[K2]**
CO5: Apply the knowledge about transducers effectively and Piezoelectric, Hall Effect. **[K3]**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1 **Understand** the Basic functional elements of instrumentation. **[K2]**	**UNIT – I: Introduction**				
		1.1	Functional elements of an instrument	T1, T2, R2	2	Chalk & Talk, PPT,
		1.2	Static and dynamic characteristics	T1, T2, R2	3	Chalk & Talk, PPT
		1.3	Errors in measurement	T1, T2, R2	2	PPT, Active Learning
		1.4	Statistical evaluation of measurement data	T1	2	PPT & NPTEL
		1.5	Standards and calibration	T1, T2, R2	3	Chalk & Talk, PPT
		1.6	Principle and types of analog and digital voltmeters, ammeters	T2, R2	3	PPT & NPTEL
ASSIGNEMENT EXAM-I						
2	CO2 **Understand** and **Applying** the concepts of Fundamentals of electrical and electronic instruments. **[K3]**	**UNIT - II: Electrical And Electronic Instruments Introduction**				
		2.1	Principle and types of multi meters	T1, T2, R2	2	Chalk & Talk
		2.2	Single and three phase watt meters and energy meters	T1, T2, R2	3	Chalk &Talk,
		2.3	Magnetic measurements – Determination of B-H curve and measurements of iron loss	T1, T2, R2	3	PPT & NPTEL
		2.4	Instrument transformers	T1, T2, R2	2	PPT & Tutorial
		2.5	Instruments for measurement of frequency and phase.	T1, T2	2	Chalk & Talk, Active Learning

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		UNIT – III: Comparative Methods Of Measurements				
3	CO3 **Analyze** the compare between various measurements techniques. **[K4]**	3.1	D.C potentiometers, D.C (Wheat stone, Kelvin and Kelvin Double bridge)	T1, R2	3	PPT & NPTEL
		3.2	A.C bridges (Maxwell, Anderson and Schering bridges)	T1, T2, R2	3	PPT & NPTEL
		3.3	Transformer ratio bridges, self-balancing bridges. Interference & screening	T1, T2, R2	4	PPT & Active Learning
		MID I EXAMINATION				
		3.4	Multiple earth and earth loops – Electrostatic and electromagnetic Interference – Grounding techniques.	T1, T2,	4	Chalk & Talk, PPT
		UNIT – IV: Storage And Display Devices				
4	CO4 **Understand** the Various storage and display devices. **[K2]**	4.1	Digital CRO, CRT display, LED, LCD	T1, T2, R2	3	Chalk & Talk, PPT &
		4.2	Dot matrix display Recorders	T1,R2	3	PPT & Active Learning
		4.3	Digital plotters and printers	T1,R2	3	NPTEL
		ASSIGNEMENT EXAM-II				
		4.4	Data Loggers. Magnetic disk and tape	T1, T2, R2	3	Chalk & Talk, Quiz
		UNIT – V: Transducers				
5	CO5 **Apply** the knowledge about transducers effectively and Piezoelectric, Hall effect. **[K3]**	5.1	Classification of transducers	T1, T2, R2	2	Chalk & Web Resources
		5.2	Selection of transducers	T1, T2, R2	2	PPT & Active Learning
		5.3	Resistive, capacitive & inductive Transducers	T1, T2, R2	3	NPTEL & Tutorial
		5.4	Piezoelectric, Hall effect, optical and digital transducers	T1, T2, R2	3	Chalk & Talk, PPT
				Total Hours: 63		
		MID II EXAMINATIONS				
		END EXAMINATIONS				

Text Books:

T1 A.K. Sawhney, 'A Course in Electrical & Electronic Measurements & Instrumentation', hanpat Rai and Co, 2010.

T2 J. B. Gupta, 'A Course in Electronic and Electrical Measurements', S. K. Kataria & Sons,Delhi, 2013.

Reference Books:

R1 H.S. Kalsi, 'Electronic Instrumentation', McGraw Hill, III Edition 2010.

R2 D.V.S. Murthy, 'Transducers and Instrumentation', Prentice Hall of India Pvt Ltd, 2015.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20EE3202	POWER SYSTEM ANALYSIS (R20)	III/II	Electrical & Electronics Engineering	4	-

COURSE OUTCOMES: Upon completion of the course, the student will be able to,

- **CO 1:** **Construct** a single line diagram & impedance diagram of a power system. [**K3**]
- **CO 2:** **Analyse** an impedance matrix with any addition or removal of element. [**K4**]
- **CO 3:** **Formulate** the power flow problem and **analyse** the power system. [**K4**]
- **CO 4:** **Design** the positive, negative, and zero sequence networks for systems consisting of machines, transmission lines and transformers. [**K4**]
- **CO 5:** **Derive** the swing equation & power angle curve in the stability analysis of power system. [**K4**]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO 1: Construct** a single line diagram & impedance diagram of a power system. [**K3**]		**UNIT-I: Representation**			
		1.1	Per unit quantities	T1,T2 R3	2	Chalk & Talk
		1.2	Single line diagram	T1,T2 R3	2	Chalk & Talk
		1.3	Impedance diagram of a power system	T1, T2, R2	2	PPT
		1.4	Graph theory definition	T1, T2, R3	1	PPT
		1.5	Formulation of Y-Bus & Z-Bus.	T1, T2 R3	2	Chalk & Talk
			ASSIGNMENT I EXAMINATIONS			
2	**CO 2: Analyse** an impedance matrix with any addition or removal of element. [**K4**]		**UNIT-II: Power flow studies**			
		2.1	Necessity of power flow studies	T1, T2, R3	1	PPT
		2.2	Derivation of Static power flow equations	T1, T2, R1	2	Chalk & Talk
		2.3	Guass - Seidel method (limited to 3 buses) - Algorithm.	T1, T2, R1	2	PPT
		2.4	Newton - Raphson method in rectangular and polar coordinates form	T1, T2, R1	2	Chalk & Talk
		2.5	Derivation of Jacobean matrix	T1, T2, R3	2	Chalk & Talk
		2.6	Power flow solution using N- R method-(3 bus)	T1, T2, R1	2	Chalk & Talk
		2.7	Decoupled and Fast decoupled method (3 bus) – Algorithms.	T1, T2, R1	2	Chalk & Talk

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3	**Formulate** the power flow problem and **analyse** the power system. [**K4**]	**UNIT–III: Symmetrical Fault analysis & Symmetrical Components**				
		3.1	Three phase short circuit currents and reactance's of synchronous machines	T2, T1, R2	2	NPTEL
		3.2	Short circuit MVA calculations	T2, T1, R2	2	Chalk & Talk
		3.3	Synthesis of unsymmetrical phasors from their symmetrical components	T2, T1, R1	2	Active Learning
		MID I EXAMINATIONS DURING EIGHTH WEEK				
		3.4	Operators	T2, T1, R2	2	PPT
		3.5	symmetrical components of unsymmetrical phasors	T2, T1, R2	2	Chalk & Talk
		3.6	Power in terms of symmetrical sequence networks	T2, T1, R2	2	Chalk & Talk
		3.7	Positive, Negative and zero sequence network.	T2, T1, R2	2	Chalk & Talk
4	**CO 4: Design** the positive, negative, and zero sequence networks for systems consisting of machines, transmission lines and transformers. [**K4**]	**UNIT - IV: Performance of Transmission Lines**				
		4.1	Various types of unsymmetrical faults	T2, T1, R1	2	Chalk & Talk
		4.2	LG on unloaded alternator	T2, T1, R2	2	Tutorial
		4.3	LL on unloaded alternator	T2, T1, R2	2	Chalk & Talk
		ASSIGNMENT II EXAMINATIONS				
		4.4	LLG on unloaded alternator	T2, T1, R3	2	NPTEL
		4.5	Unsymmetrical faults on power systems.	T2, T1, R2	2	Tutorial
5	**CO 5: Derive** the swing equation & power angle curve in the stability analysis of power system. [**K4**]	**UNIT - V: Mechanical Design of Transmission Lines and Overhead Line Insulators & Cables**				
		5.1	Classification of stability - Description of steady state stability power limits	T2, T1, R3	2	Chalk & Talk
		5.2	Transfer reactance - Synchronizing power coefficient	T2, T1, R2	2	PPT
		5.3	Power angle curve and determination of steady state stability	T2, T1, R2	2	Active Learning
		5.4	Derivation of swing equation	T2, T1, R2	2	Chalk & Talk
		5.5	Determination of transient stability by equal area criterion	T2, T1, R3	2	Tutorial
		5.6	Application of equal area criterion	T2, T1, R2	2	Chalk & Talk
		5.7	Methods to improve steady state and transient state stability	T2, T1, R2	2	PPT
					60	
MID II EXAMINATIONS DURING SIXTEENTH WEEK						
END EXAMINATIONS						

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TEXT BOOKS:

T1 Modern Power system analysis-I.J.Nagrath and D.P.Kothari- TMH, 2nd edition

T2. Computer methods in power systems analysis-Glenn Stagg, Ahmed H.EI. Abiad- McGraw-Hill International Editions.

REFERENCE BOOKS:

R1. Power system analysis-Grainger and Stevenson, Tata Mc. Graw-Hill.

R2. Power system analysis-A.R.Bergen, PHI

R3. Power system analysis-Hadi saadat- TMH edition.

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DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC1101	LINEAR ALGEBRA AND CALCULUS(R23)	I	ARTIFICIAL INTELLIGENCE	6	A, B & C

COURSE OUTCOMES: Students are able to
CO-1: Solve the system of linear equations and transformations. [K3]
CO-2: Analyze the applications of matrices in various fields and obtain Eigen values and Eigen vectors [K4]
CO-3: Utilize the mean value theorems to real life problems [K3]
CO-4: Apply the functions of several variables to evaluate the rates of change with respect to time and space variables in engineering. [K3]
CO-5: Identify the area and volume by interlinking them to appropriate double and triple integrals. [K3]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT-I: LINEAR SYSTEM OF EQUATIONS			
1	**CO1:** Solve the system of Linear Equations. [K3]	1.1	Rank of a matrix - Echelon form, Normal form.	T1, R2, R4.	2	Chalk & Talk, Active Learning & Tutorial
		1.2	Solution of linear systems, Binet-Cauchy method Direct Methods	T1, R2, R4.	2	Chalk & Talk, Active Learning & Tutorial
		1.3	Gauss elimination method	T1, R2, R4.	2	Chalk & Talk, Active Learning & Tutorial
		1.4	Gauss Jacobi's method	T1, R2, R4.	1	Chalk & Talk, Active Learning & Tutorial
		1.5	Gauss Seidel Method	T1, R2, R4.	2	Chalk & Talk, Active Learning & Tutorial
		1.6	Solutions of linear simultaneous equations	T1, R2, R4.	2	Chalk & Talk, Active

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						Learning & Tutorial
		1.7	**Application:** Finding the current in an electrical circuit	T1, R2, R4.	2	Chalk & Talk, Active Learning & Tutorial
2	**CO2:** Analyze the applications of matrices in various fields and obtain eigenvalues and eigenvectors. [K4]	**UNIT-II: EIGENVALUES AND EIGENVECTORS**				
		2.1	Eigenvalues, Eigenvectors, Properties	T1, R1, R4.	2	Chalk & Talk, Tutorial, Active Learning & Case Study
		2.2	Diagonalization of a matrix	T1, R1, R4.	2	Chalk & Talk, Tutorial, Active Learning & Case Study
		2.3	Orthogonal reduction of real symmetric matrices	T1, R1, R4.	2	Chalk & Talk, Tutorial, Active Learning & Case Study
		2.4	Quadratic forms, Reduction of quadratic form to canonical form	T1, R1, R4.	2	Chalk & Talk, Tutorial, Active Learning & Case Study
		2.5	Rank, Positive definite, negative definite, semi definite, index, signature.	T1, R1, R4.	2	Chalk & Talk, Tutorial, Active Learning & Case Study
		2.6	**Application:** Finding powers and inverse of a square matrix using Cayley Hamilton's Theorem.	T1, R1, R4.	2	Chalk & Talk, Tutorial, Active Learning & Case Study
3	**CO 3:** Relate the results of mean value theorems in calculus to Engineering problems. [K3]	**UNIT-III: MEAN VALUE THEOREMS**				
		3.1	Review on limits and continuity	T1, R1	1	Chalk & Talk, Tutorial
		3.2	Mean Value theorems (without proofs): Rolle's theorem	T1, R1	2	Chalk & Talk, Tutorial
		3.3	Lagrange's theorem	T1, R1	2	Chalk & Talk, Tutorial
		3.4	Cauchy's theorem	T1, R1	1	Chalk & Talk,

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						Tutorial
		3.5	Taylor's (Generalized mean value) theorem.	T1, R1	1	Chalk & Talk, Tutorial
		3.6	Increasing and decreasing functions	T1, R1	1	Chalk & Talk, Tutorial
		3.7	Maxima and minima of function of single variable.	T1, R1	1	Chalk & Talk, Tutorial
MID I EXAMINATIONS						
		UNIT-IV: PARTIAL DIFFERENTIATION				
4	**CO 4:** Apply the functions of several variables to evaluate the rates of change with respect to time and space variables in Engineering. [K3]	4.1	Function of two or more variables, Partial derivatives	T1, R1	2	Chalk & Talk, & Tutorial.
		4.2	Total derivatives, change of variables.	T1, R1	2	Chalk & Talk, & Tutorial
		4.3	Jacobian - functional dependence	T1, R1	2	Chalk & Talk, & Tutorial
		4.4	Taylor's theorem for Two variables.	T1, R1	2	Chalk & Talk, & Tutorial
		4.5	Maxima and Minima of functions of two variables	T1, R1	2	Chalk & Talk, & Tutorial
		4.6	Lagrange's method of undetermined multipliers.	T1, R1	3	Chalk & Talk, & Tutorial
		UNIT-V: APPLICATION OF INTEGRALS AND MULTIPLE INTEGRLS				
5	**CO5:** Evaluate the Area and Volume by inter linking them to appropriate Double and Triple Integrals [K3]	5.1	Applications of Integration to Lengths	T1, R1	2	Chalk & Talk, Tutorial, Active.
		5.2	Volumes of revolution in Cartesian and Polar Coordinates	T1, R1	2	Chalk & Talk, Tutorial, Active.
		5.3	Surface areas of revolution in Cartesian and Polar Coordinates	T1, R1	2	Chalk & Talk, Tutorial, Active.
		5.4	Multiple Integrals- double and triple integrals	T1, R1	2	Chalk & Talk, Tutorial, Active.
		5.5	Change of Variables	T1, R1	2	Chalk & Talk, Tutorial, Active.

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		5.6	Change of order of Integration.	T1, R1	3	Chalk & Talk, Tutorial, Active.
				Total	60	
MID II EXAMINATIONS						

TEXT BOOKS:

T1: Dr. B.S. Grewal, "*Higher Engineering Mathematics*", 44th Edition, Khanna Publishers, 2017.
T2: Advanced Engineering Mathematics, Erwin Kreyszig, John Wiley & sons, 2018, 10th edition.

Reference Books:

R1: Thomas Calculus, George B. Thomas, Maurice D. Weir and Joel Hass, Pearson publishers, 2018, 14th edition.
R2: Advanced Engineering Mathematics, R.K. Jain and S.R.K. Iyengar, Alpha science International Ltd., 2021 5th Edition (9th print).
R3: Advanced Modern Engineering Mathematics, Glynn James, Pearson publishers, 2018, 5th Edition.
R4: Advanced Engineering Mathematics, Michael Greenburg, Pearson publishers, 9th Edition.
R5: Higher Engineering Mathematics, H.K. Das, Er. Rajnish Varma, S. Chand Publications, 2014, 3rd Edition, (Reprint 2021).

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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601**

DEPARTMENT OF Mechanical Engineering

LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R23CC1102	Introduction to Programming (R23)	I	Mechanical	6	A

After completion of this course the student should be able to

CO	Course Outcome Statement
CO1	Understand basics of computers, the concept of algorithm and algorithmic thinking
CO2	Analyse a problem and develop an algorithm to solve it
CO3	Implement various algorithms using the C programming language
CO4	Understand more advanced features of C language
CO5	Develop problem-solving skills and the ability to debug and optimize the code.

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
		Unit-1. Introduction to Programming and Problem Solving				
	CO 1: Understand basics of computers, the concept of algorithm and algorithmic thinking. [K4]	1.1	History of Computers	T1, T2, R1	1	Chalk & Talk PPT
		1.2	Basic organization of a computer: ALU, input-output units, memory, program counter.	T1, T2, R1	1	Chalk & Talk PPT
		1.3	Introduction to Programming Languages.	T1, T2, R1	2	PPT, Active
		1.4	a Computer Program Algorithms	T1, T2, R2	2	Chalk & Talk
		1.5	Flow charts (Using Dia Tool), pseudo code.	T1, T2, R1	1	Chalk & Talk PPT
		1.6	Introduction to Compilation and Execution.	T1, T2, R1	1	Chalk & Talk
		1.7	Variables, and Constants, Basic Input and Output, Operations.	T1, T2, R1	2	Chalk & Talk
		1.8	Primitive Data Types.	T1, T2, R1	1	Chalk & Talk, PPT
		1.9	Type Conversion, and Casting.	T1, T2, R1	1	Chalk & Talk, PPT
		1.10	Problem solving techniques: Algorithmic approach, characteristics of algorithm.	T1, T2, R1	1	Chalk & Talk, PPT
		1.11	Problem solving strategies: Top-down approach, Bottom-up approach.	T1, T2, R1	1	Chalk & Talk, PPT
		1.12	Time and space complexities of algorithms.	T1, T2, R1	1	Chalk & Talk, PPT
		ASSIGNMENT I- EXAMINATION				

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		Unit-2. Control Structures					
2	CO2: Analyse a problem and develop an algorithm to solve it. [K4]	2.1	Introduction to Control Structures Simple sequential programs Conditional Statements (if, if-else, switch), Loops (for, while, do while) Break and Continue	T1, T2,R1	1	Chalk & Talk, PPT
		2.2	Conditional Control Statements (if,if-else,nested-if,,elee-if lader ,switch)	T1, T2,R1	1	
		2.3	Syntax Flow Chart For if,if-else Statements with examples	T1, T2,R1	2	Chalk & Talk, PPT
		2.4	Syntax Flow Chart For nested-if,else-if lader Statements with examples	T1, T2,R1	1	Chalk & Talk, PPT
		2.5	Syntax Flow Chart For switch Statement with examples	T1, T2,R1	1	Chalk & Talk, PPT
		2.6	Looping Control Statements (while,do-while,for loop) introduction	T1, T2,R1	1	Chalk & Talk, PPT
		2.7	Syntax Flow Chart For while loop Statement with examples	T1, T2,R1	1	Chalk & Talk, PPT
		2.8	Syntax Flow Chart For do-while loop Statement with examples	T1, T2,R1	1	Chalk & Talk, PPT
		2.9	Syntax Flow Chart For for-loop Statement with examples	T1, T2,R1	1	Chalk & Talk, PPT
		2.10	Introduction to Unconditional Control Statements (break,continue ,goto)	T1, T2,R1	1	Chalk & Talk, PPT
		2.11	Syntax and Examples using break, continue and goto statements	T1, T2,R1	1	Chalk & Talk, PPT
		MID -1 EXAMINATIONS					
3	CO3 : Implement various algorithms using the C programming language	**Unit-3. Arrays and Strings**					
		3.1	**Introduction to Arrays Arrays and Strings** Arrays indexing, memory model, programs with array of integers, two dimensional arrays, Introduction to Strings.	T1, T2, R1	1	Chalk & Talk
		3.2	Array Declaration and Intialization , types of arrays	T1, T2, R1	1	Chalk & Talk, PPT
		3.3	One Dimensional Array With Example	T1, T2, R1	2	Chalk & Talk , PPT
		3.4	One Dimensional Array With Example	T1, T2, R1	2	Chalk & Talk
		3.5	Introduction to Two Dimensional Array. Reading and Printing Elements into/from	T1, T2, R1	2	Chalk & Talk

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			the Two Dimensional Array			
		3.6	Two Dimensional Array With Example	T1, T2, R1	1	Students seminar
		3.7	Two Dimensional Array With Example	T1, T2, R1	1	Chalk & Talk
		3.8	Two Dimensional Array With Example	T1, T2, R1	1	Chalk & Talk
		3.9	Introduction to Strings	T1, T2, R1	1	Chalk & Talk
		3.10	String Handling Functions with examples	T1, T2, R1	1	Chalk & Talk
		3.11	Using gets() ,puts() , getchar(), putchar() functions in examples	T1, T2, R1	1	Chalk & Talk
		3.12	Character Handling Functions	T1, T2, R1	1	Chalk & Talk
ASSIGNMENT II- EXAMINATION						
4	CO4:Understand more advanced features of C language	**Unit 4 : Pointers & User Defined Data types**				
		4.1	Introduction to Pointers Pointers	T1, T2,R1	1	Chalk & Talk
		4.2	Dereferencing and address operators	T1, T2,R1	1	PPT
		4.3	pointer and address arithmetic,	T1, T2,R1	1	Student seminar
		4.4	array manipulation using pointers	T1, T2,R1	1	Chalk & Talk, PPT
		4.5	Introduction to Structures	T1, T2,R1	1	Chalk & Talk, PPT
		4.6	Types of Structures	T1, T2,R1	1	Chalk & Talk
		4.7	Examples using Normal, Array and pointer structure variables	T1, T2,R1	2	Chalk & Talk
		4.8	Introduction to Nested Structure with example	T1, T2,R1	1	Chalk & Talk
		4.9	Introduction to union with example.	T1, T2,R1	1	Chalk & Talk
		4.10	Differences between Structures verses unions	T1, T2,R1	1	Chalk & Talk
MID II EXAMINATION						
5	CO5: Develop problem-solving skills and the ability to debug and optimize the code.	**Unit 5. Functions & File Handling**				
		5.1	Introduction to Functions,.,	T1, T2, R1	1	Chalk & Talk
		5.2	Types of functions based on arguments with suitable examples	T1, T2,R1	1	PPT
		5.3	Types of functions based on calling with suitable examples	T1, T2,R1	1	Student Seminars
		5.4	Recursion Function with	T1, T2,R1	1	Chalk & Talk

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		5.5	Examples on arrays as parameters.	T1, T2,R1	1	Chalk & Talk
		5.6	Scope and Lifetime of Variables : Storage class specifiers	T1, T2,R1	1	Chalk & Talk, PPT
		5.7	Introduction to Files	T1, T2,R1	2	Chalk & Talk
		5.8	Basics of File Handling	T1, T2,R1	1	Chalk & Talk
		5.9	Examples using fopen(),fclose(),fseek(),rewind(), fread(),fwrite() functions	T1, T2,R1	1	Chalk & Talk
		5.10	Coping a File	T1, T2,R1	1	Chalk & Talk
					TOTAL: 65	
			MID II EXAMINATION			
			END EXAMINATIONS			

TEXT BOOKS: Textbooks:

1."The C Programming Language", Brian W. Kernighan and Dennis M. Ritchie, Prentice- Hall, 1988

2.Schaum's Outline of Programming with C, Byron S Gottfried, McGraw-Hill Education, 1996

Reference Books:

1. Computing fundamentals and C Programming, Balagurusamy, E., McGraw-Hill Education, 2008.
2. Programming in C, Rema Theraja, Oxford, 2016, 2 nd edition
3. C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE, 3rd edition

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF PHYSICS
LESSON PLAN
Academic Year:: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC1103	ENGINEERING PHYSICS	I	CYS	5	A

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO 1: Analyze the intensity variation of Laser light and its propagation in optical fibers **(Apply- K3)**

CO 2: Familiarize with the basics of crystals and their structures **(Understand- K2)**

CO 3: Summarize various types of Magnetic materials and Super conductors **(Understand- K2)**

CO 4: Explain the basic concepts of Quantum Mechanics and the free electron theory **(Understand- K2)**

CO 5: Identify the type of semiconductor ,Smart materials and their applications **(Apply- K3)**

Unit No	Outcome		Topics/Activity	Ref Text book	TotalPeriods	Delivery Method
1	**CO-1:** Analyze the intensity variation of Laser light and its propagation in optical fibers **(Apply- K3)**	**UNIT-I: LASERS, FIBER OPTICS**				
		1.1	**Lasers:** Introduction – Characteristics of lasers – Spontaneous and Stimulated emission of radiation – Population inversion -Einstein's coefficients and relation between them — Ruby laser – Helium Neon laser- Semiconductor Laser- Applications.	T1, T2 R1	13	Chalk & Talk, PPT, Active Learning & Tutorial
		1.2	**Optical Fibers:** Introduction- Basic Structure and Principle of optical fiber – Acceptance angle – Acceptance cone - Numerical Aperture - Step Index and Graded index fibers - Applications.	T1, T2 R1		
2	**CO-2:** Familiarize with the basics of crystals and their structures **(Understand- K2)**	**UNIT-II: CRYSTALLOGRAPHY, X-RAY DIFFRACTION**				
		2.1	**Crystallography:** Space lattice, Basis, Unit Cell and lattice parameters – Bravais Lattices – crystal systems (3D) – coordination number - packing fraction of SC, BCC & FCC.	T1, T2 R2	13	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		2.2	**X-ray diffraction:** Miller indices – separation between successive (hkl) planes. Bragg's law - crystal structure determination by Laue's and powder methods.	T1, T2 R2		
	MID I EXAMINATION					
3	**CO-3:** Summarize various types of Magnetic materials and Super conductors **(Understand-K2)**	**UNIT-III: MAGNETIC MATERIALS AND SUPERCONDUCTIVITY**				
		3.1	**Magnetic Materials:** Introduction -	T1, T3		

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			Magnetic dipole moment -Magnetization-Magnetic susceptibility, permeability and relation between them - atomic origin of magnetism -Classification of magnetic materials: Dia, para, Ferro, anti-ferro & Ferri magnetic materials - Hysteresis - soft and hard magnetic materials	R3	7	Talk, PPT, Tutorial
		3.2	**Super conductivity**: Introduction-Properties, Meissner effect - Type-I and Type-II super- conductors- BCS Theory-AC and DC Josephson effect-Applications	T1, T3 R3	6	
4	**CO-4:** Explain the basic concepts of Quantum Mechanics and the free electron theory **(Understand- K2)**		**UNIT-IV: Quantum Mechanics and Free electron theory**			
		4.1	**Quantum Mechanics:** De-Broglie's matter Waves – Heisenberg's Uncertainty Principle – Significance and properties of wave function – Schrodinger's time independent wave equation – Particle in a one-dimensional infinite potential well.	T1, T2 R4	13	Chalk & Talk, PPT & Tutorial
		4.2	**Free Electron Theory:** Classical free electron theory (Qualitative with discussion of merits and demerits) – electrical conductivity based on classical free electron theory – Quantum free electron theory – Fermi energy- Fermi-Dirac distribution.	T1, T2 R4		
5	**CO-5:** Identify the type of semiconductor ,Smart materials and their applications **(Apply- K3)**	5.1	**Semiconductors:** Formation of energy bands – classification of solids – Types of semiconductors - Drift and diffusion currents – Einstein's equation - Hall Effect and its applications.	T1, T2 R2	13	Chalk & Talk, PPT, Tutorial,
		5.2	**Smart materials:** Introduction - properties - types of smart materials-shape memory alloys - piezoelectric materials-magnetostrictive materials. Thermoelectric materials- magneto rheological fluids- electro rheological fluids- Chromic materials – Engineering applications of smart materials.	T1, T2 R1		
				TOTAL	**65**	
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

T1: A Text book of Engineering Physics - M. N. Avadhanulu, P.G.Kshirsagar & TVS Arun Murthy,
T2: S. Chand Publications, 11th Edition 2019.
T3: Engineering Physics - D.K.Bhattacharya and Poonam Tandon, Oxford press (2015)

Reference Books:

R1: Engineering Physics - B.K. Pandey and S. Chaturvedi, Cengage Learning

R2: Engineering Physics - Shatendra Sharma, Jyotsna Sharma, Pearson Education, 2018.

R3: Engineering Physics" - Sanjay D. Jain, D. Sahasrabudhe and Girish, University Press.

R4: Engineering Physics - M.R. Srinivasan, New Age international publishers (2009).

K. Naraj
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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda (Post), Narasaraopet - 522601**

DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN (AY: 2024-25)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC1104	PART B: BASIC MECHANICAL ENGINEERING	I	CSE	6	I

S.NO	COURSE OUTCOME STATEMENT
CO1	**Illustrate** the role of mechanical engineering and its technologies in various sectors and knowledge of engineering materials.
CO2	**Explain** the basics of various manufacturing processes and thermal engineering and its applications.
CO3	**Describe** the working of different power plants, mechanical power transmission systems and basics of robotics and its applications.

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1.		**UNIT-1: INTRODUCTION TO MECHANICAL ENGINEERING & ENGINEERING MATERIALS**			
		1.1	Role of Mechanical Engineering in Industries and Society.	T1, T3, R3,R4	2	Chalk, Talk, PPT, Web Resources
		1.2	Mechanical Engineering Technologies in different Energy sectors.	T1, T3, R3,R4	2	Chalk, Talk, PPT, Web Resources
		1.3	Mechanical Engineering Technologies in Manufacturing.	T1, T3, R3,R4	2	Chalk, Talk, PPT, Students Seminars,
		1.4	Mechanical Engineering Technologies in Automotive, Aerospace and Marine Engineering	T1, T3, R3,R4	2	Chalk, Talk, PPT, Students Seminars,
		1.5	Basics of Metals: Ferrous & Non-ferrous.	T1, T3, R3,R4	2	Chalk, Talk, PPT, Model Demonstration
		1.6	Ceramics, Composites, Smart materials.	T1, T3, R3,R4	2	Chalk, Talk, PPT, Web Resources
2	CO 2.		**UNIT-2: MANUFACTURING PROCESSES & THERMAL ENGINEERING**			
		2.1	Basics of - Principles of Casting, Forming and joining processes,	T1, T3, R2,R3	2	Chalk, Talk, PPT, Web Resources
		2.2	Machining, Introduction to CNC machines	T1, T3, R2,R3		Chalk, Talk, PPT, Students Seminars

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		2.3	3D printing, and Smart manufacturing.	T1, T3, R2,R3	2	Chalk, Talk, PPT, Model Demonstration
		2.4	Basics of - working principle of Boilers.	T1, T3, R2,R3	2	Chalk, Talk, PPT, Web Resources
		2.5	Otto cycle, Diesel cycle, Refrigeration and air-conditioning cycles.	T1, T3, R2,R3	2	Chalk, Talk, PPT, Model Demonstration
		2.6	IC engines, 2-Stroke and 4-Stroke engines, SI/CI Engines,	T1, T3, R2,R3	2	Chalk, Talk, PPT, Model Demonstration
		2.7	Components of Electric and Hybrid Vehicles.	T1, T3, R2,R3	2	Chalk, Talk, PPT, Students Seminar
3	CO 3.	**UNIT-3: POWER PLANTS & INTRODUCTION TO ROBOTICS**				
		3.1	Basics of - Working principle of Steam, Diesel, Hydro, Nuclear power plants.	T1, T2, R1,R4	2	Chalk, Talk, PPT, Web Resources
		3.2	Mechanical Power Transmission: Basics of - Belt Drives, Chain, Rope drives.	T1, T2, R1,R4	2	Chalk, Talk, PPT, Web Resources
		3.3	Gear Drives and their applications.	T1, T2, R1,R4	2	Chalk, Talk, PPT, MOOCS
		3.4	Basics of - Joints & links, configurations, and applications of robotics.	T1, T2, R1,R4	4	Chalk, Talk, PPT, Web Resources
MID I EXAMINATION DURING NINTH WEEK						
				Total	**36**	
MID II EXAMINATION DURING SEVENTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Internal Combustion Engines by V.Ganesan, By Tata McGraw Hill publications (India) Pvt. Ltd.
T2	A Tear book of Theory of Machines by S.S. Rattan, Tata McGraw Hill Publications, (India) Pvt. Ltd.
T3	An introduction to Mechanical Engg by Jonathan Wicker and Kemper Lewis, Cengage learning India Pvt. Ltd.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Appuu Kuttan KK, Robotics, I.K. International Publishing House Pvt. Ltd. Volume-I
R2	3D printing & Additive Manufacturing Technology- L. Jyothish Kumar, Pulak M Pandey, Springer publications
R3	Thermal Engineering by Mahesh M Rathore Tata McGraw Hill publications (India) Pvt. Ltd.
R4	G. Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, Tata McGraw Hill publications (India) Pvt. Ltd.

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DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC1212	BCME (R23)	I-I	CSE	6	E

COURSE OUTCOMES:

SNO	Course Outcome Statement
CO1	Understand various sub-divisions of Civil Engineering and to appreciate their role in ensuring better society.
CO2	Know the concepts of surveying and to understand the measurement of distances, angles and levels through surveying
CO3	Realize the importance of Transportation in nation's economy and the engineering measures related to Transportation
CO4	Understand the importance of Water Storage and Conveyance Structures so that the social responsibilities of water conservation will be appreciated.
CO5	Understand the basic characteristics of Civil Engineering Materials and attain knowledge on prefabricated technology

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
UNIT – I BASICS OF CIVIL ENGINEERING						
1		1.1	Role of Civil Engineers in Society	T1,T2,R1	1	PPT & Talk
		1.2	Introduction to Various Disciplines of Civil Engineering- Structural Engineering	T1,T2,R1	2	Chalk ,Talk & PPT
		1.3	Geo-technical Engineering	T1,T3,R1	2	PPT & Talk
		1.4	Transportation Engineering	T1,T2,R1	2	Chalk & Talk
		1.5	Hydraulics and Water Resources Engineering	T1,T3,R1	3	Chalk & Talk
		1.6	Environmental Engineering	T1,T2,R1	2	Chalk ,Talk & PPT
		1.7	Scope of each discipline	T1,T2,R1	2	Chalk & Talk
		1.8	Building Construction and Planning	T1,T2,R1	2	Chalk ,Talk & PPT
		1.9	Construction Materials-Cement	T1,T2,R1	2	Chalk ,Talk & PPT

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		2.0	Aggregate -Bricks	T1,T2,R1	2	Chalk ,Talk & PPT
		2.1	Bricks	T1,T2,R1	1	Chalk ,Talk & PPT
		2.2	Cement concrete-Steel	T1,T2,R1	2	Chalk ,Talk & PPT
		2.3	Prefabricated construction Techniques	T1,T2,R1	1	Chalk ,Talk & PPT
			UNIT-II SURVEYING			
2		1.7	Objectives of Surveying	T1,T1,R1	1	Chalk & PPT
		1.8	Horizontal Measurements	T2,T3,R1	3	Chalk & Talk
		1.9	Angular Measurements	T1,T2,R2	3	Active learning & Chalk
		2.0	Introduction to Bearings	T2,T3,R1	1	Tutorial &Chalk
		2.1	Introduction to Levelling	T1,T3,R1	1	Tutorial &Chalk
		2.2	instruments used for levelling	T1,T2,R1	1	Tutorial &Chalk
		2.3	Simple problems on levelling and bearings	T1,T2,R1	1	Tutorial &Chalk
		2.4	Contour mapping	T1,T2,R1	1	
NIT – III TRANSPORTATION ENGINEERING, WATER RESOURCES AND NVIRONMENTAL ENGINEERING:						
		3.1	Importance of Transportation in Nation's economic development-, -	T1,T3,R1	1	Chalk & Talk, Problem based Learning
		3.2	Types of Highway Pavements- Flexible Pavements and Rigid Pavements -Simple Differences.	T1,T3,R2	2	Chalk & Talk, Problem based Learning
		3.3	Basics of Harbour, Tunnel	T1,T3,R2	2	Chalk & Talk, Problem based Learning
		3.4	Airport, and Railway Engineering.	T1,T3,R1	2	Chalk & Talk, Problem based Learning
		3.5	**Water Resources and Environmental Engineering:** Introduction, Sources of water	T1,T3,R2	1	Chalk ,Talk & PPT
		3.6	Quality of water-Specifications-	T1,T3,R1	1	Chalk ,Talk & PPT

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		3.7	Introduction to Hydrology	T2,T3,R2	1	Chalk & Talk, Problem based Learning
		3.8	Rainwater Harvesting	T1,T3,R2	1	Chalk ,Talk & PPT
		3.9	Water Storage and Conveyance Structures (Simple introduction to Dams and Reservoirs)	T1,T3,R2	2	Chalk ,Talk & PPT

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Basic Civil Engineering, M.S.Palanisamy, , Tata Mcgraw Hill publications (India) Pvt.Ltd. Fourth Edition
T2	Introduction to Civil Engineering, S.S. Bhavikatti, New Age International Publishers.2022.First Edition
T3	Basic Civil Engineering, Satheesh Gopi, Pearson Publications, 2009, First Edition
REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Surveying, Vol- I and Vol-II, S.K. Duggal, Tata McGraw Hill Publishers 2019. Fifth Edition
R2	Hydrology and Water Resources Engineering, Santosh Kumar Garg, Khanna Publishers, Delhi. 2016
R3	Irrigation Engineering and Hydraulic Structures - Santosh Kumar Garg, Khanna Publishers, Delhi 2023. 38th Edition
R4	Highway Engineering, S.K.Khanna, C.E.G. Justo and Veeraraghavan, Nemchand andBrothers Publications 2019. 10th Edition.
R5	Indian Standard DRINKING WATER — SPECIFICATION IS 10500-2012.

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DEPARTMENT OF CHEMISTRY

LESSON PLAN

Academic Year:: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC1105	CHEMISTRY (R23)	I	CSE	6	C

COURSE OUTCOMES:

S.No.	Course Outcome Statement
	At the end of the course, the students will be able to:
CO1:	Explain the concept of electron delocalization and its importance in chemical bonding. **[K2]**
CO2:	Solve problems and utilize modern materials in practical engineering scenarios. **[K3]**
CO3:	Apply scientific concepts, experimental findings and applications related to electrochemistry **[K3]**
CO4:	Explore the synthesis of polymers, with specific polymer structures, properties and applications. **K4]**
CO5:	Summarize the concepts of Instrumental methods **[K2]**

Unit No	Outcome	Topics/Activity	Ref. Text book	Total Period	Delivery Method
1	CO-1: Explain the concept of electron delocalization and its importance in chemical bonding. (K2)	**UNIT-I: Structure and Bonding Models**			
		Molecular orbital theory – bonding in homo diatomic molecules – energy level diagrams of O_2 etc.	T1, T2 R2	12	Chalk & Talk, PPT, Active Learning & Tutorial
		Heteronuclear diatomic molecules – energy level diagrams of CO etc.			
		π-molecular orbitals of butadiene calculation of bond order.			
		π-molecular orbitals of benzene, calculation of bond order.			
		Hydrogen Bonding, Inter molecular hydrogen bonding with examples			
		Intra molecular hydrogen bonding with examples			
2	CO-2: Solve problems and utilize	**UNIT-II: Modern Engineering materials**			

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	modern materials in practical engineering scenarios. **(K3)**	**Semiconductors** – Introduction, preparation (zone refining process and czochralski process), applications.	T1, T2 R1,R3	12	Chalk & Talk, PPT Tutorial, Active Learning
		Super conductors: Introduction, types - applications.			
		Supercapacitors: Introduction, Basic Concept- Classification – Applications			
		Nano materials: Introduction, Preparation (arc discharge and laser ablation methods), properties and applications of Fullerenes, carbon nano tubes and Graphenes nanoparticles.			
		MID I EXAMINATION			
3	**CO-3:** Apply scientific concepts, experimental findings and applications related to electrochemistry **(K3)**	**UNIT-III: Electrochemistry and Applications**			
		Electrochemical cell, Electrochemical series – applications, potentiometry- potentiometric titrations (redox titrations), concept of conductivity, conductometric titrations (acid-base titrations).	T1, T3	14	Chalk & Talk, PPT, Tutorial
		Electrochemical sensors: potentiometric sensors with examples.			
		Primary cells – Secondary cells –lithium-ion - Sodium –ion batteries - Fuel Cells-Zinc-air battery, hydrogen-oxygen fuel cell, working of the batteries including cell reactions; Polymer Electrolyte Membrane Fuel cells (PEMFC).			
4	**CO-4:** Explore the synthesis of polymers, with specific polymer structures, properties and applications. **(K4)**	**UNIT-IV: Polymer Chemistry**			
		Introduction to polymers, chain growth and step growth polymerization, coordination polymerization, with specific examples and mechanisms of free radical polymerization.	T1, T2 R3	14	Chalk & Talk, PPT & Tutorial
		Elastomers–Preparation, properties and applications of Buna-S, Buna-N.			
		Plastics –Thermo plastics and Thermosetting plastics, Moulding Techniques-Compression moulding, injection moulding, preparation, properties and applications of PVC and Bakelite.			

Text Books:

T1: Jain and Jain, Engineering Chemistry, 16/e, DhanpatRai, 2013.

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		Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications. Bio-Degradable polymers - Poly Glycolic Acid (PGA), Polly Lactic Acid (PLA)			
		UNIT-V: Instrumental Methods and Applications			
5	**CO-5:** Summarize the concepts of Instrumental methods **(K2)**	Electromagnetic spectrum, Absorption of radiation: Beer-Lambert's law.	T1, T2 R1	13	Chalk & Talk, PPT, Tutorial,
		UV-Visible Spectroscopy, electronic transitions, Instrumentation, and applications.			
		FT-IR Instrumentation and applications.			
		NMR principle–Instrumentation –applications.			
			TOTAL	**65**	
MID II EXAMINATION					
END EXAMINATIONS					

T2: Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.

Reference Books:

R1: Skoog and West, Principles of Instrumental Analysis, 6/e, Thomson, 2007.
R2: J.D. Lee, Concise Inorganic Chemistry, 5th Edition, Wiley Publications, Feb.2008
R3: Textbook of Polymer Science, Fred W. Billmayer Jr, 3rd Edition

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R23CC1107	BASIC ELECTRICAL & ELECTRONICS ENGINEERING (R23)	I	ECE	6	C&D

PART A: BASIC ELECTRICAL ENGINEERING

COURSE OUTCOMES:

After completion of this course student will be able to

CO1. Explore the fundamental laws and concept of DC and AC circuits. (K3)

CO2. Demonstrate the working and operating principles of electrical machines, measuring instruments. (K3)

CO3. Demonstrate the working and operating principles of different power generation stations. (K3)

CO4. Calculate electrical load, electricity bill of residential and commercial buildings and safety measures. (K3)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1 Explore the fundamental laws and concept of DC and AC circuits. (K3)	**UNIT I: DC & AC Circuits**				
		1.1	**DC Circuits:** Electrical circuit elements (R, L and C)	T1, R1	2	Chalk & Talk, PPT
		1.2	Ohm's Law and its limitations, KCL & KVL	T1, R1	2	Chalk & Talk, PPT
		1.3	Series, Parallel, Series-Parallel circuits	T1, R1	3	PPT, Active Learning
		1.4	Super Position theorem, Simple numerical problems	T1, R1	3	PPT & Active Learning
		1.5	**AC Circuits:** A.C. Fundamentals: Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference, average value, RMS value, form factor, peak factor	T1, R1	3	Chalk & Talk, PPT
		1.6	Voltage and current relationship with phasor diagrams in R, L, and C circuits, Concept of Impedance, Active power, reactive power and apparent power, Concept of power factor (Simple Numerical problems)	T1, R1	4	PPT& Active Learning
		ASSIGNEMENT EXAM-I				
2	CO2 Demonstrate the working and operating principles of electrical machines, measuring instruments.	**UNIT - II: Machines and Measuring Instruments**				
		2.1	**Machines:** Construction, principle and operation of (i) DC Motor (ii) DC Generator	T3, R3	3	Chalk & Talk,PPT
		2.2	Construction, principle and operation of (iii) Single Phase Transformer (iv) Three Phase Induction Motor and (v) Alternator	T3, R3	3	Chalk & Talk,PPT
		2.3	Applications of electrical machines	T3, R3	2	Chalk & Talk,PPT
				T3, R3	2	Chalk &

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		2.4	working principle of Permanent Magnet Moving Coil (PMMC), Moving Iron (MI) Instruments			Talk, PPT
		2.5	Wheat Stone bridge	T3, R3	2	Chalk & Talk,PPT
3	**CO3** Demonstrate the working and operating principles of different power generation stations. (K3) **CO4** Calculate electrical load, electricity bill of residential and commercial buildings and safety measures. (K3)	**UNIT – III: Energy Resources, Electricity Bill & Safety Measures**				
		3.1	**Energy Resources:** Conventional and non-conventional energy resources	T2, R2	2	Chalk & Talk, PPT
		3.2	Layout and operation of various Power Generation systems: Hydel, Nuclear, Solar & Wind power generation	T2, R2	4	PPT & Web Resources
		3.3	**Electricity bill:** Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc.	T2, R2	3	PPT & Active Learning
		3.4	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers.	T2, R2	3	PPT & Active Learning
		3.5	**Equipment Safety Measures:** Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits	T2, R2	2	Chalk & Talk, PPT
		3.6	Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock.	T2, R2	2	Chalk & Talk
		MID I EXAMINATION				

Text Books:

T1 Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition.

T2 Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013.

T3 Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition.

Reference Books:

R1 Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Mc Graw Hill, 2019, Fourth Edition.

R2 Principles of Power Systems, V.K. Mehtha, S.Chand Technical Publishers, 2020.

R3 Basic Electrical and Electronics Engineering, S. K. Bhatacharya, Person Publications, 2018, Second Edition.

PART B: BASIC ELECTRONICS ENGINEERING

Course Outcomes: After the completion of the course students will be able to

CO1. Describe the working of diode and explore the operation of BJT and its applications. (K2)

CO2. Describe the working of Rectifiers and amplifiers in electronic circuits. (K2)

CO3. Manipulate numeric information in different forms, various codes such as ASCII, Gray,and BCD, simple Boolean expressions and boolean Theorems (K3)

CO4. Design and analyze combinational circuits, sequential circuits, flip flops Registers and Counters. (K4)

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
	CO1 Describe the working of diode and explore the operation of BJT and	**UNIT - I:SEMICONDUCTOR DEVICES**				
		1.1	Introduction - Evolution of electronics – Vacuum tubes to Nano electronics	T1, R2	3	Chalk & Talk, PPT
		1.2	Characteristics of PN Junction Diode — Zener Effect — Zener Diode and its Characteristics	T1,R2	3	PPT & Active Learning
			Bipolar Junction Transistor — CB, CE, CC	T1,R2	3	PPT &

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	its application s. (K2)	1.3	Configurations and Characteristics			Active Learning
		1.4	Elementary Treatment of Small Signal CE Amplifier	T1, R2	3	Chalk & Talk, Quiz
ASSIGNEMENT EXAM-II						
2	**CO2** Describe the working of Rectifiers and amplifiers in electronic circuits. (K2)	**UNIT -II: BASIC ELECTRONIC CIRCUITS AND INSTRUMENTTAION**				
		2.1	Block diagram description of a dc power supply, working of a full wave bridge rectifier, capacitor filter (no analysis), working of simple zener voltage regulator	T1, R1	3	Chalk & Talk, Web Resources
		2.2	Amplifiers: Block diagram of Public Address system, Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response	T1, R1	3	PPT & Active Learning
		2.3	Electronic Instrumentation: Block diagram of an electronic instrumentation system	T1, R1	3	PPT & Tutorial
3	**CO3** Manipulate numeric information in different forms, various codes such as ASCII, Gray, and BCD, simple Boolean expressions and boolean Theorems (K3) **CO4** Design and analyze combinational circuits, sequential circuits, flip flops Registers and Counters. (K4)	**UNIT III : DIGITAL ELECTRONICS**				
		3.1	Overview of Number Systems, Logic gates including Universal Gates	T2, R1	2	PPT & Active Learning
		3.2	BCD codes, Excess-3 code, Gray code, Hamming code	T2, R1	3	Chalk & Talk,PPT
		3.3	Boolean Algebra, Basic Theorems and properties of Boolean Algebra,	T2, R1	3	Chalk & Talk,PPT
		3.4	Truth Tables and Functionality of Logic Gates – NOT, OR, AND, NOR, NAND, XOR and XNOR. Simple combinational circuits	T2, R1	3	Chalk & Talk,PPT
		3.5	Half and Full Adders. Introduction to sequential circuits, Flip flops(S-R, J-K, D and T Flip flops)	T2, R1	3	PPT & Active Learning
		3.6	Registers(4-bit Shift Register - serial input and output)	T2, R1	3	Chalk & Talk,PPT
		3.7	counters (Ripple Counters, Binary Ripple Counter, Ring Counter) (Elementary Treatment only)	T2, R1	3	Chalk & Talk,PPT
MID II EXAMINATIONS						
END EXAMINATIONS						

Text Books:

T1 R. L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.

T2 R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill, 2009.

Reference Books:

R1 R. S. Sedha, A Textbook of Electronic Devices and Circuits, S. Chand & Co, 2010.

R2 Salivahanan, N. Suresh Kumar, A. Vallavaraj, "Electronic Devices and Circuits" Tata McGraw-Hill, Second Edition, 2008.

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M. Gowtham.

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Principal

NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda (Post), Narasaraopet- 522601

DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/ Week	Sections
R23CC1108	ENGINEERING GRAPHICS	I-I	ECE	6	A

COURSE OUTCOMES: Students are able to

S. No.	Course Outcome Statement
CO1	Understand the principles of engineering drawing, including engineering curves, scales, orthographic and isometric projections. (K2)
CO2	Draw and interpret orthographic projections of points, lines, planes and solids in front,top and side views.(K3)
CO3	Understand and draw projection of solids in various positions in first quadrant (K3)
CO4	Explain principles behind development of surfaces. (K5)
CO5	Prepare isometric and perspective sections of simple solids (K6)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Understand the principles of engineering drawing, including engineering curves, scales, orthographic and isometric projections. (K2)		**Unit-1**			
		1.1	Introduction: Lines, Lettering and Dimensioning	T1, R1	3	Chalk & Talk PPT
		1.2	Geometrical Constructions and Constructing regular polygons by general method	T1, T2, R2	3	Chalk & Talk PPT
		1.3	Curves: construction of ellipse, parabola and hyperbola by general method	T1, R2	6	Chalk & Talk PPT
		1.4	Cycloids, Involutes, Normal and tangent to Curves	T1, T2, R1	3	Chalk & Talk PPT
		1.5	Plain scales, diagonal scales	T1, R1	3	Chalk & Talk PPT
		1.6	vernier scales	T1, T2, R1	3	Chalk & Talk, PPT

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2	CO 2: Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views.(K3)	**Unit-2**				
		2.1	Orthographic Projections: Reference plane, importance of reference lines or Plane	T1, R1	3	Chalk & Talk PPT, Web Resources
		2.2	Projections of a point situated in any one of the four quadrants	T1, T2, R2	3	Chalk & Talk PPT, Brainstorming
		2.3	Projections of straight lines parallel to both reference planes, perpendicular to one reference plane and parallel to other reference plane	T1, R2	3	Chalk & Talk PPT
		2.4	Projections of straight lines inclined to one reference plane and parallel to the other reference plane. Projections of Straight Line Inclined to both the reference planes.	T1, T2, R1	3	Chalk & Talk PPT
		2.5	Projections of Planes: regular planes Perpendicular to both reference planes, parallel to one reference plane and inclined to the other reference plane;	T1, R1	3	Chalk & Talk PPT, Model Demonstration
		2.6	plane inclined to both the reference planes	T1, T2, R1	6	Chalk & Talk PPT, Web Resources
MID I EXAMINATIONS						
3	CO3: Understand and draw projection of solids in various positions in first quadrant (K3)	**Unit-3**				
		3.1	Projections of Solids: Types of solids: Polyhedra and Solids of revolution. Projections of solids in simple positions:	T1, R1	3	Chalk & Talk PPT, Model Demonstration
		3.2	Projections of Solids Axis perpendicular to horizontal plane, Axis perpendicular to vertical plane	T1, T2, R2	3	Chalk & Talk PPT
		3.3	Projection of Solids with axis inclined to one reference plane and parallel to another plane.	T1, R2	3	Chalk & Talk PPT, Web Resources
		Unit-4				
4	CO4 Explain principles behind development of surfaces. (K5)	4.1	Sections of Solids: Sections of solids in simple position only	T1, T2, R2	6	Chalk & Talk PPT, Model Demonstration
		4.2	Development of Surfaces: Methods of Development: Parallel line development and radial line	T1, T2, R2	6	Chalk & Talk PPT

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			development			
		4.3	Development of a cube, prism	T1, T2, R2	3	Chalk & Talk PPT, Model Demonstration
		4.4	Development of a cylinder, pyramid and cone.	T1, T2, R2	3	Chalk & Talk PPT, Web Resources
		Unit-5				
5	CO5: Prepare isometric and perspective sections of simple solids (K6)	5.1	Conversion of isometric views to orthographic views	T1, T2, R2	6	Chalk & Talk PPT, Brainstorming, Model Demonstration
		5.2	Conversion of orthographic views to isometric views.	T1, T2, R2	6	Chalk & Talk PPT, Web Resources
		5.3	Computer graphics: Creating 2D drawings of objects including PCB and Transformations using Auto CAD	T1, T2, R2	3	Chalk & Talk PPT, Web Resources
		5.4	Computer graphics: Creating 3D drawings of objects including PCB and Transformations using Auto CAD	T1, T2, R2	3	Chalk & Talk PPT

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Engineering Drawing by N.D. Butt, Chariot Publications.
T2	Engineering Drawing by K.L.Narayana & P. Kannaiah, Scitech Publishers.
REFE RENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Engineering Graphics for Degree by K.C. John, PHI Publishers.
R2	Engineering Drawing by Basant Agarwal & CM. Agarwal, Tata McGraw Hill Publishers.

M.Venkai

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601 Department of Basic Sciences & Humanities

Lesson Plan

Communicative English

Course Code	Course Title	Sem	Branch	Periods per week	Sections
R23CC1103	Communicative English	I - I	CSE	5	C&D

COURSE OUTCOMES:

S No	Course Outcomes
CO1	Summarize texts based on the comprehension of the material provided.
CO2	Create coherent and well-structured paragraphs, essays, and letters on a range of familiar topics.
CO3	Utilize a diverse array of grammatical structures with flexibility, striving to minimize errors.
CO4	Use vocabulary adequately and appropriately to express and write on a variety of topics.

S.No.	Unit No.	COS	Topic	No.of Periods	Teaching Methodology
1	1	CO-1 (Applying)	**HUMAN VALUES:** The Gift of the Magi **(Short Story)**	2	Chalk & Talk Blended Learning Activity based PPT
2		CO-4 (Applying)	a. Content words and function words	1	
3		CO-3 (Applying)	b. verbs, nouns, adjectives and adverbs	2	
4		CO-3 (Applying)	c. Capital letters and Punctuations	1	
5		CO-4 (Applying)	d. Commonly misspelt words	2	
6		CO-3 (Applying)	e. Wh - questions	2	
7		CO-2 (Applying)	f. Reading: Skimming and Scanning	1	
8		CO-4 (Applying)	g. Word order in sentences	1	
9	2	CO-1 (Applying)	**NATURE:**The Brook by Alfred Tennyson (Poem)	2	

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10		CO-2 (Creating)	a. Preparing and delivering short structured talks	1	Chalk & Talk Flipped Class
11		CO-2 (Creating)	b. Main idea and supporting ideas	2	
12		CO-2 (Creating)	c. Identifying sequence of ideas	1	
13		CO-2 (Creating)	d. Paragraph writing	1	
14		CO-2 (Applying)	e. Sequencing	1	
15		CO-3 (Applying)	f. Cohesive devices: linkersa/sign posts/transition signals	2	
16		CO-3 (Applying)	g. Articles and zero articles, prepositions	2	
17	3	CO-1 (Applying)	**BIOGRAPHY:** Elon Musk	2	Chalk & Talk Blended Learning Activity based
18		CO-2 (Applying)	a. Summarizing	2	
19		CO-3 (Applying)	b. Avoiding redundancies and repetitions	2	
20		CO-3 (Applying)	c. Verbs: Tenses, subject-verb agreement	1	
21		CO-2 (Applying)	d. Drawing inferences	1	
22		CO-2 (Applying)	e. Note-Making	2	
23		CO-2 (Applying)	f. Paraphrasing & Summarizing	3	
24	4	CO-1 (Applying)	**INSPIRATION:** The Toys of Peace by Saki	2	Chalk & Talk PPT Cooperative Learning
25		CO-3 (Applying)	a. Reported speech	2	
26		CO-2 (Applying)	b. Academic Reporting verbs	1	
27		CO-3 (Applying)	c. Active voice &passive voice	1	
28		CO-4 (Applying)	d. Words often confused	2	
29		CO-2 (Applying)	e. Official letters & Data interpretation	2	
30		CO-2 (Applying)	f. Resume writing	2	

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31	5	CO-1 (Applying)	**MOTIVATION:** The Power of Intrapersonal Communication (An Essay)	3	Chalk & Talk Flipped Class
32		CO-2 (Applying)	a. Essay writing	2	
33		CO-3 (Applying)	b. Correction of sentences	2	
34		CO-2 (Applying)	c. Reading Comprehension	1	
35		CO-4 (Applying)	d. Technical Vocabulary	2	

TEXT BOOK	
	Book Title/Authors/Publisher
	1. Pathfinder: Communicative English for Undergraduate Students, 1st Edition, OrientBlack Swan, 2023 (Units 1,2 & 3) 2. Empowering with Language by Cengage Publications, 2023 (Units 4 & 5)

REFERENCE BOOKS	
	Book Title/Authors/Publisher
R1	1. Dubey, Sham Ji & Co. English for Engineers, Vikas Publishers, 2020
R2	2. Bailey, Stephen. Academic writing: A Handbook for International Students. Routledge,2014.
R3	3. Murphy, Raymond. English Grammar in Use, Fourth Edition, Cambridge UniversityPress, 2019.
R4	4. Lewis, Norman. Word Power Made Easy- The Complete Handbook for Building aSuperior Vocabulary. Anchor, 2014.

Signature of Faculty

Signature of HoD

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NARASARAOPETA ENGINEERING COLLEGE
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(AUTONOMOUS)

DEPARTMENT OF BASIC SCIENCES AND HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC1201	DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS(R20)	II	CYBER SECURITY	6	

COURSE OUTCOMES: Students are able to
CO1: Apply first order ordinary differential equations to real life situations. [K3]
CO2: Identify and apply suitable methods in solving the higher order differential equations. [K3]
CO3: Solve the partial differentiation equations. [K3]
CO4: Interpret the physical meaning of different operators as gradient, curl and divergence. [K3]
CO5: Estimate the work done against a field, circulation and flux using vector calculus. [K5]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1**: Apply first order ordinary differential equations to real life situations. [K3]	**UNIT-I: DIFFERENTIAL EQUATIONS OF FIRST ORDER AND FIRST DEGREE**				
		1.1	Introduction on first order and first degree differential equations	T1, R2, R4	1	Chalk & Talk, & Tutorial
		1.2	Linear Differential Equation	T1, R2, R4	2	Chalk & Talk& Tutorial
		1.3	Bernoulli's Differential Equation	T1, R2, R4	2	Chalk & Talk, & Tutorial
		1.4	Exact Differential Equation	T1, R2, R4	2	Chalk & Talk, & Tutorial
		1.5	Equations reducible to exact form	T1, R2, R4	3	Chalk & Talk, & Tutorial
		1.6	Newton's Law of cooling	T1, R2, R4	2	Chalk & Talk, & Tutorial
		1.7	Law of natural growth and decay	T1, R2, R4	1	Chalk & Talk, & Tutorial
		1.9	Electrical circuits	T1, R2, R4	2	Chalk & Talk, & Tutorial
2	**CO2**: Identify and apply suitable methods in solving the higher order differential equations. [K3]	**UNIT-II: LINEAR DIFFERENTIAL EQUATIONS OF HIGHER ORDER**				
		2.1	Introduction on Higher order differential equations	T1, R1, R2	1	Chalk & Talk, Tutorial
		2.2	Finding the complementary functions.	T1, R1, R2	2	Chalk & Talk, Tutorial
		2.3	Inverse operator and Rules for finding the particular integrals.	T1, R1, R2	2	Chalk & Talk, Tutorial
		2.4	Problems on Types (I, II, III & IV).	T1, R1, R2	3	Chalk & Talk, Tutorial
		2.5	Method of variation of parameters.	T1, R1, R2	1	Chalk & Talk, Tutorial
		2.6	Simultaneous linear equations with constant coefficients.	T1, R1, R2	2	Chalk & Talk, Tutorial
		2.7	L-C-R Circuit problems.	T1, R1, R2	2	Chalk & Talk, Tutorial
		2.8	Simple Harmonic Motion	T1, R1, R2	2	Chalk & Talk, Tutorial
3		**UNIT-III: PARTIAL DIFFERENTIAL EQUATIONS**				
		3.1	Formation of partial differential equation by elimination of arbitrary constants	T1, R1, R2	2	Chalk & Talk, Tutorial

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	CO 3: Solve the partial differentiation equations. [K3]	3.2	Formation of partial differential equation by elimination of arbitrary functions	T1,T2, R1	2	Chalk & Talk, Tutorial
		3.3	solutions of first order linear (Lagrange's) equations	T1,T2, R1	3	Chalk & Talk, Tutorial
		3.4	Homogeneous and Non-homogeneous linear partial differential equations with constant coefficients.	T1,T2, R1	3	Chalk & Talk, Tutorial
	MID I EXAMINATIONS					
4	**CO4:** Interpret the physical meaning of different operators as gradient, curl and divergence. [K3]		**UNIT-IV: VECTOR DIFFERENTIATION**			
		4.1	Introduction on Vector Differentiation	T1,T2, R2	2	Chalk & Talk, & Tutorial
		4.2	Scalar and vector point functions	T1,T2, R2	2	Chalk & Talk & Tutorial
		4.3	vector operator del	T1,T2, R2	2	Chalk & Talk, & Tutorial
		4.4	Del applies to scalar point functions-Gradient	T1,T2, R2	2	Chalk & Talk & Tutorial
		4.5	Del applied to vector point functions-Divergence and Curl	T1,T2, R2	1	Chalk & Talk & Tutorial
		4.6	Vector identities	T1,T2, R2	1	Chalk & T & Tutorial
5	**CO5:** Estimate the work done against a field, circulation and flux using vector calculus.[K5]		**UNIT-V: VECTOR INTEGRATION**			
		5.1	Line integral-circulation-work done	T1,T2, R1,R5	1	Chalk & Talk, Tutorial.
		5.2	Surface integral-flux	T1,T2, R1,R5	2	Chalk & Talk, Tutorial.
		5.3	Green's theorem in the plane (without proof)	T1,T2, R1,R5	2	Chalk & Talk, Tutorial.
		5.4	Stoke's theorem (without proof)	T1,T2, R1,R5	2	Chalk & Talk, Tutorial.
		5.5	Volume integral	T1,T2, R1,R5	1	Chalk & Talk, Tutorial.
		5.6	Divergence theorem(without proof)	T1,T2, R1,R5	2	Chalk & Talk, Tutorial.
				Total	60	
	MID II EXAMINATIONS					

TEXT BOOKS :

1. Dr. B.S. Grewal, "*Higher Engineering Mathematics*", 44rd Edition, Khanna Publishers, 2017.
2. Advanced Engineering Mathematics, Erwin Kreyszig, John Wiley & Sons, 2018, 10th Edition.

REFERENCES:

1. Thomas Calculus, George B. Thomas, Maurice D. Weir and Joel Hass, Pearson Publishers, 2018, 14th Edition.
2. Advanced Engineering Mathematics, Dennis G. Zill and Warren S. Wright, Jones and Bartlett, 2018.
3. Advanced Modern Engineering Mathematics, Glyn James, Pearson publishers, 2018, 5th Edition.
4. Advanced Engineering Mathematics, R. K. Jain and S. R. K. Iyengar, Alpha Science International Ltd., 2021 5th Edition (9th reprint).
5. Higher Engineering Mathematics, B. V. Ramana, McGraw Hill Education, 2017.

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DEPARTMENT OF Basic Science & Humanities

LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC1202	DATA STRUCTURES (R23)	II	Data Science	6	--

After completion of the course, student will be able to:

CO	Course Outcome Statement
CO1	Analyze the role of linear data structures in organizing and accessing data efficiently [K4].
CO2	Design, implement, and apply linked lists for dynamic data storage [K6].
CO3	Make use of Stack to handle recursive algorithms and other applications [K3].
CO4	Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between deques and priority queues, and apply them appropriately to solve data management challenges [K3].
CO5	Identify and implement novel solutions to small scale programming challenges involving data structures such as Graphs and Trees [K3].
CO6	Identify scenarios where hashing is advantageous, and design hash-based solutions for specific problems [K3].

Unit No	Outcome		Topics /Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1:** Analyze the role of linear data structures in organizing and accessing data efficiently [K4].	**Unit-1. Introduction to Data Structures and Algorithms**				
		1.1	Definition and importance of data structures	T1, T2, R1	1	Chalk & Talk
		1.2	Classification of data structures	T1, T2, R1	2	Chalk & Talk
		1.3	Abstract data types (ADTs) and their implementation	T1, T2, R1	2	PPT, Active
		1.4	Operations on Data structures	T1, T2, R2	2	Chalk & Talk
		1.5	Overview of time and space complexity, analysis of data structures.	T1, T2, R1	2	Chalk & Talk
		1.6	Searching Techniques: Linear, Binary	T1, T2, R1	3	Chalk & Talk
		1.7	Bubble sort	T1, T2, R1	1	Chalk & Talk, PPT
		1.8	Selection sort	T1, T2, R1	1	Chalk & Talk, PPT
		1.9	Insertion Sort	T1, T2, R1	1	Chalk & Talk, PPT
		ASSIGNMENT I EXAMINATION				

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2	**CO2:** Design, implement, and apply linked lists for dynamic data storage [K6].	**Unit-2. Linked Lists**				
		2.1	Singly linked lists-	T1, T2,R1	2	Chalk & Talk, PPT
		2.2	Representation and operations	T1, T2,R1	5	Chalk & Talk
		2.3	Doubly linked lists	T1, T2,R1	4	Chalk & Talk, PPT
		2.4	Circular linked lists	T1, T2,R1	2	Chalk & Talk, PPT
		2.5	Comparing arrays and linked lists	T1, T2,R1	1	Chalk & Talk, PPT
		2.6	Applications of linked lists	T1, T2,R1	1	Chalk & Talk, PPT
	MID I EXAMINATION					
3	**CO3:** Make use of Stack to handle recursive algorithms and other applications [K3].	**Unit-3. Stacks**				
		3.1	Stack: properties and operations	T1, T2, R1	2	Chalk & Talk
		3.2	Array Representation of stacks	T1, T2, R1	2	Chalk & Talk, PPT
		3.3	Operations on stack, Linked representation of stacks,	T1, T2, R1	2	Chalk & Talk, PPT
		3.4	Applications of stacks, evaluation of a postfix expression	T1, T2, R1	2	Chalk & Talk
		3.5	Conversion of infix expression into a postfix expression.	T1, T2, R1	2	Chalk & Talk
		3.6	Backtracking	T1, T2, R1	2	Chalk & Talk
		3.7	Reversing a list	T1, T2, R1	1	Chalk & Talk
	ASSIGNMENT II EXAMINATION					
4	**CO4:** Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between deques and priority queues, and apply them appropriately to solve data management challenges [K3].	**UNIT-4. Queues**				
		4.1	Introduction to queues: properties and operations	T1, T2, R1	1	Students seminar
		4.2	Array Representation of Queues	T1, T2, R1	2	Chalk & Talk
		4.3	Linked representation of Queues using arrays	T1, T2, R1	2	Chalk & Talk
		4.4	Application of queues in breadth-first search,	T1, T2, R1	2	Chalk & Talk
		4.5	Application of queues in scheduling	T1, T2, R1	1	Chalk & Talk
		4.6	Introduction to dequeues	T1, T2, R1	2	Chalk & Talk

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		4.7	Operations on deques and their applications.	T1, T2, R1	2	Chalk & Talk
5	**CO5:** Identify and implement novel solutions to small scale programming challenges involving data structures such as Graphs and Trees [K3]. **CO6:** Identify scenarios where hashing is advantageous, and design hash-based solutions for specific problems [K3].	**Unit-5. Trees**				
		5.1	Introduction to Trees, Binary Tress	T1, T2,R1	2	Chalk & Talk
		5.2	Tree traversals	T1, T2,R1	2	PPT student seminar
		5.3	Binary Search Tree – Insertion, Deletion & Traversal	T1, T2,R1	4	Chalk & talk
		5.4	Brief introduction to hashing and hash functions	T1, T2,R1	2	Chalk & Talk
		5.5	Collision resolution techniques: chaining and open addressing	T1, T2,R1	2	Chalk & Talk, PPT
		5.6	Hash tables: basic implementation and operations,	T1, T2,R1	2	Chalk & Talk, PPT
		5.7	Applications of hashing in unique identifier generation, caching, etc.	T1, T2,R1	2	Chalk & Talk, PPT
					TOTAL: 73	
			MID II EXAMINATION			
			END EXAMINATIONS			

TEXTBOOKS:

1. Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition.
2. Fundamentals of data structures in C, Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, Silicon Press, 2008

REFERENCE BOOKS:

1. Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders
2. C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft
3. Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum
4. Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein
5. Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms" by Robert Sedgewick

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WEB RESOURCES:

1. https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013501595428077568125 59/overview
2. nptel.ac.in/courses/106103069
3. nptel.ac.in/courses/106102064

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda (Post), Narasaraopet- 522601

DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

A.Y : 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/ Week	Sections
R23CC1204	ENGINEERING GRAPHICS	I-II	CSE	6	C

COURSE OUTCOMES: Students are able to

S. No.	Course Outcome Statement
CO1	Understand the principles of engineering drawing, including engineering curves, scales, orthographic and isometric projections. (K2)
CO2	Draw and interpret orthographic projections of points, lines, planes and solids in front,top and side views.(K3)
CO3	Understand and draw projection of solids in various positions in first quadrant (K3)
CO4	Explain principles behind development of surfaces. (K5)
CO5	Prepare isometric and perspective sections of simple solids (K6)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Understand the principles of engineering drawing, including engineering curves, scales, orthographic and isometric projections. (K2)		**Unit-1**			
		1.1	Introduction: Lines, Lettering and Dimensioning	T1, R1	3	Chalk & Talk PPT
		1.2	Geometrical Constructions and Constructing regular polygons by general method	T1, T2, R2	3	Chalk & Talk PPT
		1.3	Curves: construction of ellipse, parabola and hyperbola by general method	T1, R2	6	Chalk & Talk PPT
		1.4	Cycloids, Involutes, Normal and tangent to Curves	T1, T2, R1	3	Chalk & Talk PPT
		1.5	Plain scales, diagonal scales	T1, R1	3	Chalk & Talk PPT
		1.6	vernier scales	T1, T2, R1	3	Chalk & Talk, PPT

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2	CO 2: Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views.(K3)	**Unit-2**					
		2.1	Orthographic Projections: Reference plane, importance of reference lines or Plane	T1, R1	3	Chalk & Talk PPT, Web Resources
		2.2	Projections of a point situated in any one of the four quadrants	T1, T2, R2	3	Chalk & Talk PPT, Brainstorming
		2.3	Projections of straight lines parallel to both reference planes, perpendicular to one reference plane and parallel to other reference plane	T1, R2	3	Chalk & Talk PPT
		2.4	Projections of straight lines inclined to one reference plane and parallel to the other reference plane. Projections of Straight Line Inclined to both the reference planes.	T1, T2, R1	3	Chalk & Talk PPT
		2.5	Projections of Planes: regular planes Perpendicular to both reference planes, parallel to one reference plane and inclined to the other reference plane;	T1, R1	3	Chalk & Talk PPT, Model Demonstration
		2.6	plane inclined to both the reference planes	T1, T2, R1	6	Chalk & Talk PPT, Web Resources
MID I EXAMINATIONS							
3	CO3: Understand and draw projection of solids in various positions in first quadrant (K3)	**Unit-3**					
		3.1	Projections of Solids: Types of solids: Polyhedra and Solids of revolution. Projections of solids in simple positions:	T1, R1	3	Chalk & Talk PPT, Model Demonstration
		3.2	Projections of Solids Axis perpendicular to horizontal plane, Axis perpendicular to vertical plane	T1, T2, R2	3	Chalk & Talk PPT
		3.3	Projection of Solids with axis inclined to one reference plane and parallel to another plane.	T1, R2	3	Chalk & Talk PPT, Web Resources
		Unit-4					

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4	CO4 Explain principles behind development of surfaces. (K5)	4.1	Sections of Solids: Sections of solids in simple position only	T1, T2, R2	6	Chalk & Talk PPT, Model Demonstration
		4.2	Development of Surfaces: Methods of Development: Parallel line development and radial line development	T1, T2, R2	6	Chalk & Talk PPT
		4.3	Development of a cube, prism	T1, T2, R2	3	Chalk & Talk PPT, Model Demonstration
		4.4	Development of a cylinder, pyramid and cone.	T1, T2, R2	3	Chalk & Talk PPT, Web Resources
		Unit-5				
5	CO5: Prepare isometric and perspective sections of simple solids (K6)	5.1	Conversion of isometric views to orthographic views	T1, T2, R2	6	Chalk & Talk PPT, Brainstorming, Model Demonstration
		5.2	Conversion of orthographic views to isometric views.	T1, T2, R2	6	Chalk & Talk PPT, Web Resources
		5.3	Computer graphics: Creating 2D drawings of objects including PCB and Transformations using Auto CAD	T1, T2, R2	3	Chalk & Talk PPT, Web Resources
		5.4	Computer graphics: Creating 3D drawings of objects including PCB and Transformations using Auto CAD	T1, T2, R2	3	Chalk & Talk PPT

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Engineering Drawing by N.D. Butt, Chariot Publications.
T2	Engineering Drawing by K.L.Narayana & P. Kannaiah, Scitech Publishers.
REFE RENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Engineering Graphics for Degree by K.C. John, PHI Publishers.
R2	Engineering Drawing by Basant Agarwal & CM. Agarwal, Tata McGraw Hill Publishers.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF PHYSICS
LESSON PLAN
Academic Year :: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC1205	ENGINEERING PHYSICS	II	CSE	5	C, F

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO 1: Analyze the intensity variation of Laser light and its propagation in optical fibers **(Apply- K3)**

CO 2: Familiarize with the basics of crystals and their structures **(Understand- K2)**

CO 3: Summarize various types of Magnetic materials and Super conductors **(Understand- K2)**

CO 4: Explain the basic concepts of Quantum Mechanics and the free electron theory **(Understand- K2)**

CO 5: Identify the type of semiconductor ,Smart materials and their applications **(Apply- K3)**

Unit No	Outcome		Topics/Activity	Ref Text book	TotalPe riods	Delivery Method
1	**CO-1:** Analyze the intensity variation of Laser light and its propagation in optical fibers **(Apply- K3)**		**UNIT-I: LASERS, FIBER OPTICS**			
		1.1	**Lasers:** Introduction – Characteristics of lasers – Spontaneous and Stimulated emission of radiation – Population inversion -Einstein's coefficients and relation between them — Ruby laser – Helium Neon laser- Semiconductor Laser- Applications.	T1, T2 R1	13	Chalk & Talk, PPT, Active Learning & Tutorial
		1.2	**Optical Fibers:** Introduction- Basic Structure and Principle of optical fiber – Acceptance angle – Acceptance cone - Numerical Aperture - Step Index and Graded index fibers - Applications.	T1, T2 R1		
2	**CO-2:** Familiarize with the basics of crystals and their structures **(Understand- K2)**		**UNIT-II: CRYSTALLOGRAPHY, X-RAY DIFFRACTION**			
		2.1	**Crystallography:** Space lattice, Basis, Unit Cell and lattice parameters – Bravais Lattices – crystal systems (3D) – coordination number - packing fraction of SC, BCC & FCC.	T1, T2 R2	13	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		2.2	**X-ray diffraction:** Miller indices – separation between successive (hkl) planes. Bragg's law - crystal structure determination by Laue's and powder methods.	T1, T2 R2		
	MID I EXAMINATION					
3	**CO-3:** Summarize various types of Magnetic materials and Super conductors**(Understand-K2)**		**UNIT-III: MAGNETIC MATERIALS AND SUPERCONDUCTIVITY**			
		3.1	**Magnetic Materials:** Introduction -	T1, T3		Chalk &

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			Magnetic dipole moment -Magnetization- Magnetic susceptibility, permeability and relation between them - atomic origin of magnetism -Classification of magnetic materials: Dia, para, Ferro, anti-ferro & Ferri magnetic materials - Hysteresis - soft and hard magnetic materials	R3	7	Talk, PPT, Tutorial
		3.2	**Super conductivity:** Introduction- Properties, Meissner effect - Type-I and Type-II super- conductors- BCS Theory- AC and DC Josephson effect-Applications	T1, T3 R3	6	
4	**CO-4:** Explain the basic concepts of Quantum Mechanics and the free electron theory **(Understand- K2)**		**UNIT-IV: Quantum Mechanics and Free electron theory**			
		4.1	**Quantum Mechanics:** De-Broglie's matter Waves – Heisenberg's Uncertainty Principle – Significance and properties of wave function – Schrodinger's time independent wave equation – Particle in a one-dimensional infinite potential well.	T1, T2 R4	13	Chalk & Talk, PPT & Tutorial
		4.2	**Free Electron Theory:** Classical free electron theory (Qualitative with discussion of merits and demerits) – electrical conductivity based on classical free electron theory – Quantum free electron theory – Fermi energy- Fermi-Dirac distribution.	T1, T2 R4		
5	**CO-5:** Identify the type of semiconductor ,Smart materials and their applications **(Apply- K3)**	5.1	**Semiconductors:** Formation of energy bands – classification of solids – Types of semiconductors - Drift and diffusion currents – Einstein's equation - Hall Effect and its applications.	T1, T2 R2	13	Chalk & Talk, PPT, Tutorial.
		5.2	**Smart materials:** Introduction - properties - types of smart materials- shape memory alloys - piezoelectric materials-magnetostrictive materials. Thermoelectric materials- magneto rheological fluids- electro rheological fluids- Chromic materials – Engineering applications of smart materials.	T1, T2 R1		
				TOTAL	**65**	
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

T1: A Text book of Engineering Physics - M. N. Avadhanulu, P.G.Kshirsagar & TVS Arun Murthy,
T2: S. Chand Publications, 11th Edition 2019.
T3: Engineering Physics - D.K.Bhattacharya and Poonam Tandon, Oxford press (2015)

Reference Books:

R1: Engineering Physics - B.K. Pandey and S. Chaturvedi, Cengage Learning

R2: Engineering Physics - Shatendra Sharma, Jyotsna Sharma, Pearson Education, 2018.

R3: Engineering Physics" - Sanjay D. Jain, D. Sahasrabudhe and Girish, University Press.

R4: Engineering Physics - M.R. Srinivasan, New Age international publishers (2009).

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601 Department of Basic Sciences & Humanities

Lesson Plan
Communicative English

Course Code	Course Title	Sem	Branch	Periods per week	Sections
R23CC1206	Communicative English	I - II	ECE	5	C

COURSE OUTCOMES:

S No	Course Outcomes
CO1	Understand and summarized texts based on the comprehension of the material provided.
CO2	Create coherent and well-structured paragraphs, essays, and letters on a range of familiar topics.
CO3	Use a diverse array of grammatical structures with flexibility, striving to minimize errors.
CO4	Use vocabulary adequately and appropriately to express and write on a variety of topics.

S.No.	Unit No.	COS	Topic	No.of Periods	Teaching Methodology
1	1	CO-1 (Applying)	**HUMAN VALUES:** The Gift of the Magi **(Short Story)**	2	Chalk & Talk Blended Learning Activity based PPT Cooperative Learning
2		CO-4 (Applying)	a. Content words and function words	1	
3		CO-3 (Applying)	b. verbs, nouns, adjectives and adverbs	2	
4		CO-3 (Applying)	c. Capital letters and Punctuations	1	
5		CO-4 (Applying)	d. Commonly misspelt words	2	
6		CO-3 (Applying)	e. Wh - questions	2	
7		CO-2 (Applying)	f. Reading: Skimming and Scanning	1	
8		CO-4 (Applying)	g. Word order in sentences	1	
9	2	CO-1	**NATURE:** The Brook by Alfred Tennyson (Poem)	2	

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		(Applying)			
10		CO-2 (Creating)	a. Preparing and delivering short structured talks	1	
11		CO-2 (Creating)	b. Main idea and supporting ideas	2	Chalk & Talk Blended Learning Activity based PPT Cooperative Learning
12		CO-2 (Creating)	c. Identifying sequence of ideas	1	
13		CO-2 (Creating)	d. Paragraph writing	1	
14		CO-2 (Applying)	e. Sequencing	1	
15		CO-3 (Applying)	f. Cohesive devices: linkersa/sign posts/transition signals	2	
16		CO-3 (Applying)	g. Articles and zero articles, prepositions	2	
17	3	CO-1 (Applying)	**BIOGRAPHY:** Elon Musk	2	
18		CO-2 (Applying)	a. Summarizing	2	
19		CO-3 (Applying)	b. Avoiding redundancies and repetitions	2	Chalk & Talk Blended Learning Activity based PPT Cooperative Learning
20		CO-3 (Applying)	c. Verbs: Tenses, subject-verb agreement	1	
21		CO-2 (Applying)	d. Drawing inferences	1	
22		CO-2 (Applying)	e. Note-Making	2	
23		CO-2 (Applying)	f. Paraphrasing & Summarizing	3	
24		CO-1 (Applying)	**INSPIRATION:** The Toys of Peace by Saki	2	
25		CO-3 (Applying)	a. Reported speech	2	Chalk & Talk Blended Learning Activity based

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26	4	CO-2 (Applying)	b. Academic Reporting verbs	1	PPT Cooperative Learning
27		CO-3 (Applying)	c. Active voice &passive voice	1	
28		CO-4 (Applying)	d. Words often confused	2	
29		CO-2 (Applying)	e. Official letters & Data interpretation	2	
30		CO-2 (Applying)	f. Resume writing	2	
31		CO-1 (Applying)	**MOTIVATION:** The Power of Intrapersonal Communication (An Essay)	3	Chalk & Talk Blended Learning Activity based PPT CooperativeLearning
32		CO-2 (Applying)	a. Essay writing	2	
33		CO-3 (Applying)	b. Correction of sentences	2	
34		CO-2 (Applying)	c. Reading Comprehension	1	
35		CO-4 (Applying)	d. Technical Vocabulary	2	
			e.		

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TEXT BOOK	
	Book Title/Authors/Publisher
	1. Pathfinder: Communicative English for Undergraduate Students. 1st Edition. OrientBlack Swan. 2023 (Units 1,2 & 3) 2. Empowering with Language by Cengage Publications. 2023 (Units 4 & 5)

REFERENCE BOOKS	
	Book Title/Authors/Publisher
R1	1. Dubey, Sham Ji & Co. English for Engineers. Vikas Publishers. 2020
R2	2. Bailey, Stephen. Academic writing: A Handbook for International Students. Routledge,2014.
R3	3. Murphy, Raymond. English Grammar in Use. Fourth Edition. Cambridge UniversityPress. 2019.
R4	4. Lewis. Norman. Word Power Made Easy- The Complete Handbook for Building aSuperior Vocabulary. Anchor. 2014.

Signature of Faculty

Signature of HoD

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Narasaraopeta Engineering College

(Autonomous)

Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF CHEMISTRY

LESSON PLAN

Academic Year::2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC1208	ENGINEERING CHEMISTRY	II	CIVIL & MECH	6	A

COURSE OUTCOMES:

S.No.	Course Outcome Statement
CO1	Understand the difference between soft and hard water and why it matters in daily life and industries. **[K1]**
CO2	Apply electrochemical principles to real-problems, making informed decisions about materials selection, corrosion mitigation, and energy storage solutions. **[K3]**
CO3	Analyze the production, properties, and environmental implications of polymers, fuels and biofuels. **[K4]**
CO4	Apply the knowledge of diverse engineering materials like composites, refractories, lubricants, and Portland cement, to make material selection and applications.. **[K3]**
CO5	Apply the Knowledge of various applications to synthesize colloids and characterize nanomaterials. **[K3]**

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Unit No	Outcome	Topics/Activity	Ref. Text book	Total Periods	Delivery Method
		UNIT-I: Water Technology			
1	**CO-1:** Explain the concept between soft and hard water and why it matters in daily life and industries. **(K1)**	**Soft and hard water** - Estimation of hardness of water by EDTA Method. Estimation of dissolved Oxygen Boiler troubles –Priming, foaming, scale and sludge, Caustic embrittlement. Industrial water treatment – Specifications for drinking water, Bureau of Indian Standards(BIS) and World health organization(WHO) standards. Ion-exchange process Desalination of brackish water, reverse osmosis (RO) and electro dialysis.	T1, T2 R1	13	Chalk & Talk, PPT, Active Learning & Tutorial
		UNIT-II: Electrochemistry and Applications			
2	**CO-2:** Apply scientific concepts, experimental findings and applications related to electrochemistry **(K3)**	**Electrochemical cell** Reference electrodes: Metal-metal ion electrode (Calomel electrode) Primary cells – Zinc-air battery, Secondary cells – Nickel-Cadmium (Ni-Cd), Sodium –ion and lithium ion batteries- working principle of the batteries including cell reactions Fuel cells- Basic Concepts, the principle and working of hydrogen-oxygen Fuel cell. **Corrosion**: Introduction to corrosion, electrochemical theory of corrosion, differential aeration cell corrosion, galvanic corrosion, metal oxide formation by dry electrochemical corrosion, Pilling- Bed worth ratios and uses, Factors affecting the corrosion, cathodic and anodic protection, electroplating and electroless plating (Nickel and Copper)	T1, T2 R2	15	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		MID I EXAMINATION			
		UNIT-III: Polymers and Fuel Chemistry			
3	**CO-3:** Explore the synthesis of polymers, with specific polymer structures, properties and applications.**(K4)**	**Introduction to polymers.** Mechanism of chain growth, step growth polymerization. Plastics –Thermo plastics and Thermosetting plastics, Moulding Techniques-Compression moulding, injectionmoulding, Blow moulding. Elastomers – Preparation, properties and applications of Buna S, Buna N. **Fuels**– Types of fuels, calorific value of fuels, numerical problems based on calorific value. Analysis of coal (Proximate and Ultimate	T1, T3 R3	12	Chalk & Talk, PPT, Tutorial

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		analysis). Liquid Fuels. refining of petroleum. Octane and Cetane number- alternative fuels- propane, methanol, ethanol and bio fuel-bio diesel				
		UNIT-IV: Modern Engineering Materials				
4	**CO-4:** Explore the synthesis of engineering materials like composites, refractories, lubricants **(K4)**	**Composites-** Definition, Constituents, Classification- Particle, Fibre and Structural reinforced composites, properties and Engineering applications **Refractories-** Classification, Properties, Factors affecting the refractory materials and Applications. **Lubricants-** Classification, Functions of lubricants, Mechanism, Properties of lubricating oils –Viscosity, Viscosity Index, Flash point, Fire point, Cloud point, saponification and Applications. **Building materials-** Portland Cement, constituents, Setting and Hardening of cement.	T1, T2 R4	15	Chalk & Talk, PPT & Tutorial
5	**CO-5:** Summarize the concepts various applications to synthesize colloids and characterize Nanomaterials. **(K2)**	**UNIT-V: Surface Chemistry and Nanomaterials** . Introduction to surface chemistry colloids, micelle formation, synthesis of colloids (Braggs Method). stabilization of colloids by stabilizing agents. **Nano materials:** Introduction–Sol-gel method & chemical reduction method of preparation – Characterization by BET method and TEM methods Carbon nano tubes and fullerenes: Types–preparation–properties and applications.	T1, T2 R2	10	Chalk & Talk, PPT, Tutorial,
			TOTAL	**65**	
		MID II EXAMINATION			
		END EXAMINATIONS			

Textbooks:

1. Jain and Jain, Engineering Chemistry, 16/e, DhanpatRai, 2013.
2. Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.

Reference Books:

1. H.F.W. Taylor, Cement Chemistry, 2/e, Thomas Telford Publications, 1997.
2. D.J. Shaw, Introduction to Colloids and Surface Chemistry, Butterworth- Heineman, 1992.
3. Textbook of Polymer Science, Fred W. Billmayer Jr, 3rd Edition

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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601**

DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN A.Y: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC1209	ENGINEERINGMECHANICS	II	ME & CE	6	A

COURSE OUTCOMES: Students are able to

CO1:**Apply** the principles of mechanics to determine the resultant of several concurrent Forces acting on a particle. **(K3)**

CO2: **Analyze** the trusses using method of joints and method of sections; apply the basic Concepts of dry friction and wedges. **(K4)**

CO3: **Solve** the centroid and centre of gravity bodies and composite sections. **(K3)**

CO4: **Solve** the Area Moment of Inertia and Mass Moment of Inertia of areas bodies and Composite sections. **(K3)**

CO5:**Apply** the work-energy principle to particles and connected systems for engineering Applications. **(K3)**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1:**Apply** the principles of mechanics to determine the resultant of several concurrent Forces acting on a particle. **(K3)**		**Unit-1.**			
		1.1	**INTRODUCTION TO ENGINEERING MECHANICS:** Basic Concepts, Scope and Applications, Characteristics of a Force, Force system, classification, Resultant of Force Systems, parallelogram law of forces, Triangle law of forces.	T1, T2, R1	4	Chalk & Talk, PPT.
		1.2	**SYSTEMS OF FORCES:** Resolution of forces, Coplanar Concurrent forces, Components in Space, Moment of Force and its Application–Couples, Varignon's theorem.	T1, T2, R1	4	Chalk & Talk, PPT
		1.3	**EQUILIBRIUM OF SYSTEMS OF FORCES:** Equations of Equilibrium of Coplanar concurrent forces, Equations of Equilibrium for spatial system of forces using vector approach, Numerical Examples, Lami's Theorem, support reactions, free body diagrams.	T1, T2, R1	4	Chalk & Talk, PPT
2	CO2: **Analyze** the trusses using method of joints and method of sections; apply the basic Concepts of dry friction and wedges. **(K4)**		**Unit-2.**			
		2.1	**ANALYSIS OF PLANE TRUSSES:** Definition, Assumptions made in the analysis of plane trusses.	T1, T2, R3	1	Chalk & Talk, PPT
		2.2	Analysis of plane truss by methods of joints.	T1, T2, R3	3	Chalk & Talk, Active Learning
		2.3	Analysis of plane truss by method of sections.	T1, T2, R3	3	Chalk & Talk, Active Learning
		2.4	**FRICTION:** Introduction, Classification of friction, Laws of Friction, Coefficient of Friction, Angle of Friction, Angle of Repose, Motion of a body on an Inclined Plane.	T1, T2, R1	3	Chalk & Talk, PPT, Active
		2.5	Cone of Static friction.	T1, T2, R1	2	Chalk & Talk

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3	CO3: **Solve** the centroid and center of gravity bodies and composite sections. **(K3)**	**Unit-3.**				
		3.1	**CENTROID**: Centroids of simple figures (from basic principles)-Centroids of composite figures.	T1, T2, R3	4	Chalk & Talk, & Demonstration with models
		3.2	**CENTRE OF GRAVITY:** Centre of Gravity of simple body (from basic principles), Centre of gravity of composite bodies.	T1, T2, R3	4	Chalk & Talk, & Demonstration with models
		3.3	Pappu's theorem.	T1, T2, R3	4	Chalk & Talk.
4	CO4: **Solve** the Area Moment of Inertia and Mass Moment of Inertia of areas bodies and Composite sections. **(K3)**	**Unit 4.**				
		4.1	**AREA MOMENTS OF INERTIA:** Definition, Radius of gyration, Parallel axis theorem, perpendicular axis theorem.	T1, T2, R3	3	Chalk & Talk, PPT
		4.2	Moments of Inertia of composite figures.	T1, T2, R3	3	Chalk & Talk, PPT
		4.3	polar moment of Inertia.	T1, T2, R3	3	Chalk & Talk, PPT
		4.4	**MASS MOMENT OF INERTIA:** Moment of Inertia of Rigid body-Moment of Inertia from basic principles-Slender bar, Rectangular Plate, Circular Plate, Moment of Inertia of 3D Bodies-Cone, Solid Cylinder.	T1	3	Chalk & Talk, PPT
5	CO5:**Apply** the work-energy principle to particles and connected systems for engineering Applications. **(K3)**	**Unit 5.**				
		5.1	**Rectilinear and Curvilinear motion of a particle**: Kinematics and Kinetics - D'Alembert's Principle	T1, T2, R1	3	Chalk & Talk, PPT
		5.2	Work Energy method and applications to particle motion	T1, T2, R1	3	Chalk & Talk, PPT
		5.3	Impulse Momentum method.	T1, T2, R1	3	Chalk & Talk, PPT
		5.4	Principle of Virtual work with simple Examples.	T2,T3 R3	3	Chalk & Talk, PPT

Text Books:

1. Engineering Mechanics by S.Timoshenko&D.H.Young., 4th Edn - ,Mc Graw Hill publications
2. Engineering Mechanics by S.S. Bhavikatti-New age publications.
3. Engineering Mechanics Statics and Dynamics A.K.TAYAL Umesh publications.

References:

1. Engineering Mechanics by Fedinand . L. Singer , Harper – Collins..
2. Mechanics of Materials (In Si Units) by Beer and Johnson, Tata McGraw-Hil.
3. Strength of Materials (Mechanics of Materials) by James M.Gere and Barry J.Goodno. PWS-KENT Publishing Company, 1990.
4. Strength of Materials (Mechanics of Solids) by R.K. Rajput , S.Chand Publications

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23EC1211	NETWORK ANALYSIS (R23)	II	Electronics and communication Engineering	6	A&B

COURSE OUTCOMES: Students are able to
CO1: Understand basic electrical circuits with nodal and mesh analysis. [K2]
CO2: Analyse the circuit using network simplification theorems. [K4]
CO3: Find Transient response and Steady state response of a network.[K3]
CO4: Analyse electrical networks in the Laplace domain. [K4]
CO5: Compute the parameters of a two-port network. [K3]

Unit No.	Outcome		Topics/Activity	Ref. Text book	Total Periods	Delivery Method
1	CO 1: **Understand** basic electrical circuits with nodal and mesh analysis. [K2] CO2: **Analyse** the circuit using network simplification theorems. [K4]		**UNIT I**			
		1.1	Types of circuit components. Types of Sources and Source Transformations	T1, T2, R3	2	Chalk & Talk
		1.2	Mesh analysis and Nodal analysis, problem solving with resistances only including dependent sources also.	T1, T2, R3	2	Chalk & Talk
		1.3	Principal of Duality with examples.	T1, T2, R1	2	Chalk & Talk, Tutorial
		1.4	Thevenin's, Norton's, Milliman's Theorems.	T1, T2, R3	2	Chalk & Talk
		1.5	Reciprocity, Compensation, Substitution, Theorems.	T1, T2, R3	2	Chalk & Talk, Tutorial
		1.6	Superposition, Max Power Transfer and Tellegens Theorems- problem solving using dependent sources also.	T1, T2, R3	2	Chalk & Talk, Tutorial
	ASSIGNMENT I EXAMINATIONS					
2	CO3: **Find** Transient response and Steady state response of a network.[K3]		**UNIT II**			
		2.1	**Transients:** First order differential equations, Definition of time constants, R-L circuit, R-C circuit with DC excitation,	T1, T2, R2	2	Chalk & Talk, PPT
		2.2	Evaluating initial conditions procedure, second order differential equations, homogeneous, non-homogenous.	T1, T2, R2	2	Chalk & Talk
		2.3	Problem-solving using R-L-C elements with DC excitation and AC excitation, Response as related to s-plane rotation of roots.	T1, T2, R2	2	Chalk & Talk, Tutorial
		2.4	**Laplace transform:** introduction, Laplace transformation, basic theorems, problem solving using Laplace transform. ,	T2, R2	2	Chalk & Talk, PPT& alk

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		2.5	Partial fraction expansion. Heaviside's expansions	T1, T2, R2	2	Chalk & Talk
		2.6	Problem solving using Laplace transform.	T1, T2, R2	2	Chalk & Talk
			MID I EXAMINATIONS			
3	CO 4: **Analyse** electrical networks in the Laplace domain. [K4]		**UNIT III**			
		3.1	**Steady State Analysis of A.C Circuits:** Impedance concept, phase angle, series R-L, R-C, R-L-C circuits problem solving.	T1, T2, R1	2	Chalk & Talk, Tutorial
		3.2	Complex impedance and phasor notation for R-L, R-C, R-L-C	T1, T2, R1	2	Chalk & Talk
		3.3	Problem solving using mesh analysis	T1, T2, R1	2	Chalk & Talk, Tutorial
		3.4	Complex impedance and phasor notation for R-L, R-C, R-L-C problem solving using nodal analysis,	T1, T2, R1	2	Chalk & Talk, Tutorial
		3.5	Star-Delta conversion.	T1, T2, R1	2	Chalk & Talk
		3.6	Problem solving using Laplace transforms also.	T1, T2, R1	2	Chalk & Talk, Tutorial
			ASSIGNMENT II EXAMINATIONS			
4			**UNIT IV**			
		4.1	**Resonance:** Introduction, Definition of Q, Series resonance.	T2, T3,R1	2	Chalk & Talk
		4.2	Bandwidth of series resonance.	T2, T3,R1	2	Chalk & Talk
		4.3	Parallel resonance, general case-resistance present in both branches, anti-resonance at all frequencies.	T2, T3,R1	2	Chalk & Talk
		4.4	Coupled Circuits: Self-inductance, Mutual inductance, Coefficient of coupling.	T2, T3,R1	2	Chalk & Talk
		4.5	Analysis of coupled circuits, Natural current, Dot rule of coupled circuits.	T2, T3,R1	2	Chalk & Talk
		4.6	Conductively coupled equivalent circuits- problem solving.	T2, T3,R1	2	Chalk & Talk, Tutorial
5	CO5: **Compute** the parameters of a two-port network. [K3]		**UNIT V**			
		5.1	**Two-port Networks:** Relationship of two port networks, Z-parameters, Y-parameters, Transmission line parameters, h- parameters.	T1, T2,R3	2	Chalk & Talk, PPT
		5.2	Relationships between parameter Sets.	T1, T2,R3	2	Chalk & Talk
		5.3	Parallel & series connection of two port networks, cascading of two port networks.	T1, T2,R3	2	Chalk & Talk, Tutorial
		5.4	Problem solving using dependent sources also.	T1, T2,R3		Chalk & Talk

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		5.5	Image and iterative impedances. Image and iterative transfer constants. Insertion loss.	T1, T2,R3	2	Chalk & Talk, Tutorial
		5.6	Attenuators and pads. Lattice network and its parameters. Impedance matching networks.	T1, T2,R3	2	Chalk & Talk, Tutorial
				Total	60	
MID II EXAMINATIONS						
END EXAMINATIONS						

Text Books:

T1 Network Analysis – ME Van Valkenburg, Prentice Hall of India, revised 3rd Edition, 2019.

T2 Engineering Circuit Analysis by William H. Hayt, Jack Kemmerly, Jamie Phillips, Steven M. Durbin, 9th Edition 2020.

T3 Network lines and Fields by John. D. Ryder 2nd Edition, PHI

Reference Books:

R1 D. Roy Choudhury, Networks and Systems, New Age International Publications, 2013.

R2 Joseph Edminister and Mahmood Nahvi, Electric Circuits, Schaum's Outline Series,7th Edition, Tata McGraw Hill Publishing Company, New Delhi, 2017

R3 Fundamentals of Electric Circuits by Charles K. Alexander and Matthew N. O. Sadiku, McGraw-Hill Education

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NEC	Narasaraopeta Engineering College (Autonomous) Yallamanda (Post), Narasaraopet- 522601

DEPARTMENT OF CIVIL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC1212	BCME (R23)	I-II	ECE	6	A&B

COURSE OUTCOMES:

SNO	Course Outcome Statement
CO1	Understand various sub-divisions of Civil Engineering and to appreciate their role in ensuring better society.
CO2	Know the concepts of surveying and to understand the measurement of distances, angles and levels through surveying
CO3	Realize the importance of Transportation in nation's economy and the engineering measures related to Transportation
CO4	Understand the importance of Water Storage and Conveyance Structures so that the social responsibilities of water conservation will be appreciated.
CO5	Understand the basic characteristics of Civil Engineering Materials and attain knowledge on prefabricated technology

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
UNIT – I BASICS OF CIVIL ENGINEERING						
1		1.1	Role of Civil Engineers in Society	T1,T2,R1	1	PPT & Talk
		1.2	Introduction to Various Disciplines of Civil Engineering- Structural Engineering	T1,T2,R1	2	Chalk ,Talk & PPT
		1.3	Geo-technical Engineering	T1,T3,R1	2	PPT & Talk
		1.4	Transportation Engineering	T1,T2,R1	2	Chalk & Talk
		1.5	Hydraulics and Water Resources Engineering	T1,T3,R1	3	Chalk & Talk
		1.6	Environmental Engineering	T1,T2,R1	2	Chalk ,Talk & PPT
		1.7	Scope of each discipline	T1,T2,R1	2	Chalk & Talk
		1.8	Building Construction and Planning	T1,T2,R1	2	Chalk ,Talk & PPT
		1.9	Construction Materials-Cement	T1,T2,R1	2	Chalk ,Talk & PPT
		2.0	Aggregate -Bricks		2	Chalk ,Talk &

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				T1,T2,R1		PPT
		2.1	Bricks	T1,T2,R1	1	Chalk ,Talk & PPT
		2.2	Cement concrete-Steel	T1,T2,R1	2	Chalk ,Talk & PPT
		2.3	Prefabricated construction Techniques	T1,T2,R1	1	Chalk ,Talk & PPT
UNIT-II SURVEYING						
2		1.7	Objectives of Surveying	T1,T1,R1	1	Chalk & PPT
		1.8	Horizontal Measurements	T2,T3,R1	3	Chalk & Talk
		1.9	Angular Measurements	T1,T2,R2	3	Active learning & Chalk
		2.0	Introduction to Bearings	T2,T3,R1	1	Tutorial &Chalk
		2.1	Introduction to Levelling	T1,T3,R1	1	Tutorial &Chalk
		2.2	instruments used for levelling	T1,T2,R1	1	Tutorial &Chalk
		2.3	Simple problems on levelling and bearings	T1,T2,R1	1	Tutorial &Chalk
		2.4	Contour mapping	T1,T2,R1	1	
UNIT – III TRANSPORTATION ENGINEERING, WATER RESOURCES AND ENVIRONMENTAL ENGINEERING:						
3		3.1	Importance of Transportation in Nation's economic development-, -	T1,T3,R1	1	Chalk & Talk, Problem based Learning
		3.2	Types of Highway Pavements- Flexible Pavements and Rigid Pavements -Simple Differences.	T1,T3,R2	2	Chalk & Talk, Problem based Learning
		3.3	Basics of Harbour, Tunnel	T1,T3,R2	2	Chalk & Talk, Problem based Learning
		3.4	Airport, and Railway Engineering.	T1,T3,R1	2	Chalk & Talk, Problem based Learning
		3.5	**Water Resources and Environmental Engineering:** Introduction, Sources of water	T1,T3,R2	1	Chalk ,Talk & PPT
		3.6	Quality of water-Specifications-	T1,T3,R1	1	Chalk ,Talk & PPT
		3.7	Introduction to	T2,T3,R2	1	Chalk & Talk,

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			Hydrology			Problem based Learning
		3.8	Rainwater Harvesting	T1,T3,R2	1	Chalk .Talk & PPT
		3.9	Water Storage and Conveyance Structures (Simple introduction to Dams and Reservoirs)	T1,T3,R2	2	Chalk .Talk & PPT

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Basic Civil Engineering, M.S.Palanisamy, , Tata Mcgraw Hill publications (India) Pvt.Ltd. Fourth Edition
T2	Introduction to Civil Engineering, S.S. Bhavikatti, New Age International Publishers.2022.First Edition
T3	Basic Civil Engineering, Satheesh Gopi, Pearson Publications, 2009, First Edition
REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Surveying, Vol- I and Vol-II, S.K. Duggal, Tata McGraw Hill Publishers 2019. Fifth Edition
R2	Hydrology and Water Resources Engineering, Santosh Kumar Garg, Khanna Publishers, Delhi. 2016
R3	Irrigation Engineering and Hydraulic Structures - Santosh Kumar Garg, Khanna Publishers, Delhi 2023. 38th Edition
R4	Highway Engineering, S.K.Khanna, C.E.G. Justo and Veeraraghavan, Nemchand andBrothers Publications 2019. 10th Edition.
R5	Indian Standard DRINKING WATER — SPECIFICATION IS 10500-2012.

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DEPARTMENT OF Civil Engineering

LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R23CC1102	Introduction to Programming (R23)	I	Civil	6	A

After completion of this course the student should be able to

CO	Course Outcome Statement
CO1	Understand basics of computers, the concept of algorithm and algorithmic thinking
CO2	Analyse a problem and develop an algorithm to solve it
CO3	Implement various algorithms using the C programming language
CO4	Understand more advanced features of C language
CO5	Develop problem-solving skills and the ability to debug and optimize the code.

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
		Unit-1. Introduction to Programming and Problem Solving				
	CO 1: Understand basics of computers, the concept of algorithm and algorithmic thinking. [K4]	1.1	History of Computers	T1, T2, R1	1	Chalk & Talk PPT
		1.2	Basic organization of a computer: ALU, input-output units, memory, program counter.	T1, T2, R1	1	Chalk & Talk PPT
		1.3	Introduction to Programming Languages.	T1, T2, R1	2	PPT, Active
		1.4	a Computer Program Algorithms	T1, T2, R2	2	Chalk & Talk
		1.5	Flow charts (Using Dia Tool), pseudo code.	T1, T2, R1	1	Chalk & Talk PPT
		1.6	Introduction to Compilation and Execution.	T1, T2, R1	1	Chalk & Talk
		1.7	Variables, and Constants, Basic Input and Output, Operations.	T1, T2, R1	2	Chalk & Talk
		1.8	Primitive Data Types.	T1, T2, R1	1	Chalk & Talk, PPT
		1.9	Type Conversion, and Casting.	T1, T2, R1	1	Chalk & Talk, PPT
		1.10	Problem solving techniques: Algorithmic approach, characteristics of algorithm.	T1, T2, R1	1	Chalk & Talk, PPT
		1.11	Problem solving strategies: Top-down approach, Bottom-up approach.	T1, T2, R1	1	Chalk & Talk, PPT
		1.12	Time and space complexities of algorithms.	T1, T2, R1	1	Chalk & Talk, PPT
		ASSIGNMENT I- EXAMINATION				

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2	CO2: Analyse a problem and develop an algorithm to solve it. [K4]	**Unit-2. Control Structures**				
		2.1	Introduction to Control Structures Simple sequential programs Conditional Statements (if, if-else, switch), Loops (for, while, do while) Break and Continue	T1, T2,R1	1	Chalk & Tal- PPT
		2.2	Conditional Control Statements (if,if-else,nested-if,,elee-if lader ,switch)	T1, T2,R1	1	
		2.3	Syntax Flow Chart For if,if-else Statements with examples	T1, T2,R1	2	Chalk & Talk, PPT
		2.4	Syntax Flow Chart For nested-if,else-if lader Statements with examples	T1, T2,R1	1	Chalk & Talk, PPT
		2.5	Syntax Flow Chart For switch Statement with examples	T1, T2,R1	1	Chalk & Talk, PPT
		2.6	Looping Control Statements (while,do-while,for loop) introduction	T1, T2,R1	1	Chalk & Talk, PPT
		2.7	Syntax Flow Chart For while loop Statement with examples	T1, T2,R1	1	Chalk & Talk, PPT
		2.8	Syntax Flow Chart For do-while loop Statement with examples	T1, T2,R1	1	Chalk & Talk, PPT
		2.9	Syntax Flow Chart For for-loop Statement with examples	T1, T2,R1	1	Chalk & Talk, PPT
		2.10	Introduction to Unconditional Control Statements (break,continue ,goto)	T1, T2,R1	1	Chalk & Talk, PPT
		2.11	Syntax and Examples using break, continue and goto statements	T1, T2,R1	1	Chalk & Talk, PPT
		MID -1 EXAMINATIONS				
3	CO3 : Implement various algorithms using the C programming language	**Unit-3. Arrays and Strings**				
		3.1	**Introduction to Arrays Arrays and Strings** Arrays indexing, memory model, programs with array of integers, two dimensional arrays, Introduction to Strings.	T1, T2, R1	1	Chalk & Talk
		3.2	Array Declaration and Intialization , types of arrays	T1, T2, R1	1	Chalk & Talk, PPT
		3.3	One Dimensional Array With Example	T1, T2, R1	2	Chalk & Talk , PPT
		3.4	One Dimensional Array With Example	T1, T2, R1	2	Chalk & Talk
		3.5	Introduction to Two Dimensional Array. Reading and Printing Elements into/from	T1, T2, R1	1	Chalk & Talk

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			the Two Dimensional Array			
		3.6	Two Dimensional Array With Example	T1, T2, R1	1	Students seminar
		3.7	Two Dimensional Array With Example	T1, T2, R1	1	Chalk & Talk
		3.8	Two Dimensional Array With Example	T1, T2, R1	1	Chalk & Talk
		3.9	Introduction to Strings	T1, T2, R1	1	Chalk & Talk
		3.10	String Handling Functions with examples	T1, T2, R1	1	Chalk & Talk
		3.11	Using gets() ,puts() , getchar(), putchar() functions in examples	T1, T2, R1	1	Chalk & Talk
		3.12	Character Handling Functions	T1, T2, R1	1	Chalk & Talk
	ASSIGNMENT II- EXAMINATION					
4	CO4:Understand more advanced features of C language	**Unit 4 : Pointers & User Defined Data types**				
		4.1	Introduction to Pointers Pointers	T1, T2,R1	1	Chalk & Talk
		4.2	Dereferencing and address operators	T1, T2,R1	1	PPT
		4.3	pointer and address arithmetic,	T1, T2,R1	1	Student seminar
		4.4	array manipulation using pointers	T1, T2,R1	1	Chalk & Talk, PPT
		4.5	Introduction to Structures	T1, T2,R1	1	Chalk & Talk, PPT
		4.6	Types of Structures	T1, T2,R1	1	Chalk & Talk
		4.7	Examples using Normal, Array and pointer structure variables	T1, T2,R1	2	Chalk & Talk
		4.8	Introduction to Nested Structure with example	T1, T2,R1	1	Chalk & Talk
		4.9	Introduction to union with example.	T1, T2,R1	1	Chalk & Talk
		4.10	Differences between Structures verses unions	T1, T2,R1	1	Chalk & Talk
	MID II EXAMINATION					
5	CO5: Develop problem-solving skills and the ability to debug and optimize the code.	**Unit 5. Functions & File Handling**				
		5.1	Introduction to Functions,.,	T1, T2, R1	1	Chalk & Talk
		5.2	Types of functions based on arguments with suitable examples	T1, T2,R1	1	PPT
		5.3	Types of functions based on calling with suitable examples	T1, T2,R1	1	Student Seminars
		5.4	Recursion Function with	T1, T2,R1	1	Chalk & Talk

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601 Department of Basic Sciences & Humanities

Lesson Plan

Communicative English

Course Code	Course Title	Sem	Branch	Periods per week	Sections
R23CC1103	Communicative English	I - II	ECE	5	A

COURSE OUTCOMES:

S No	Course Outcomes
CO1	Understand and summarized texts based on the comprehension of the material provided.
CO2	Create coherent and well-structured paragraphs, essays, and letters on a range of familiar topics.
CO3	Use a diverse array of grammatical structures with flexibility, striving to minimize errors.
CO4	Use vocabulary adequately and appropriately to express and write on a variety of topics.

S.No.	Unit No.	COS	Topic	No.of Periods	Teaching Methodology
1	1	CO-1 (Applying)	**HUMAN VALUES:** The Gift of the Magi **(Short Story)**	2	Chalk & Talk Blended Learning Activity based PPT Cooperative Learning
2		CO-4 (Applying)	a. Content words and function words	1	
3		CO-3 (Applying)	b. verbs, nouns, adjectives and adverbs	2	
4		CO-3 (Applying)	c. Capital letters and Punctuations	1	
5		CO-4 (Applying)	d. Commonly misspelt words	2	
6		CO-3 (Applying)	e. Wh - questions	2	
7		CO-2 (Applying)	f. Reading: Skimming and Scanning	1	
8		CO-4 (Applying)	g. Word order in sentences	1	
9	2	CO-1	**NATURE:** The Brook by Alfred Tennyson (Poem)	2	

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		(Applying)			
10		CO-2 (Creating)	a. Preparing and delivering short structured talks	1	
11		CO-2 (Creating)	b. Main idea and supporting ideas	2	
12		CO-2 (Creating)	c. Identifying sequence of ideas	1	Chalk & Talk Blended Learning Activity based PPT Cooperative Learning
13		CO-2 (Creating)	d. Paragraph writing	1	
14		CO-2 (Applying)	e. Sequencing	1	
15		CO-3 (Applying)	f. Cohesive devices: linkersa/sign posts/transition signals	2	
16		CO-3 (Applying)	g. Articles and zero articles. prepositions	2	
17	3	CO-1 (Applying)	**BIOGRAPHY:** Elon Musk	2	
18		CO-2 (Applying)	a. Summarizing	2	
19		CO-3 (Applying)	b. Avoiding redundancies and repetitions	2	Chalk & Talk Blended Learning Activity based PPT Cooperative Learning
20		CO-3 (Applying)	c. Verbs: Tenses. subject-verb agreement	1	
21		CO-2 (Applying)	d. Drawing inferences	1	
22		CO-2 (Applying)	e. Note-Making	2	
23		CO-2 (Applying)	f. Paraphrasing & Summarizing	3	
24	4	CO-1 (Applying)	**INSPIRATION:** The Toys of Peace by Saki	2	
25		CO-3 (Applying)	a. Reported speech	2	Chalk & Talk Blended Learning Activity based PPT Cooperative Learning
26		CO-2 (Applying)	b. Academic Reporting verbs	1	
27		CO-3 (Applying)	c. Active voice &passive voice	1	
28		CO-4 (Applying)	d. Words often confused	2	
29		CO-2 (Applying)	e. Official letters & Data interpretation	2	
30		CO-2 (Applying)	f. Resume writing	2	

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31		CO-1 (Applying)	**MOTIVATION:** The Power of Intrapersonal Communication (An Essay)	3
32		CO-2 (Applying)	a. Essay writing	2
33		CO-3 (Applying)	b. Correction of sentences	2
34		CO-2 (Applying)	c. Reading Comprehension	1
35		CO-4 (Applying)	d. Technical Vocabulary	2

TEXT BOOK	
	Book Title/Authors/Publisher
	1. Pathfinder: Communicative English for Undergraduate Students, 1st Edition, OrientBlack Swan, 2023 (Units 1,2 & 3) 2. Empowering with Language by Cengage Publications, 2023 (Units 4 & 5)

REFERENCE BOOKS	
	Book Title/Authors/Publisher
R1	1. Dubey, Sham Ji & Co. English for Engineers, Vikas Publishers, 2020
R2	2. Bailey, Stephen. Academic writing: A Handbook for International Students. Routledge,2014.
R3	3. Murphy, Raymond. English Grammar in Use, Fourth Edition, Cambridge UniversityPress, 2019.
R4	4. Lewis, Norman. Word Power Made Easy- The Complete Handbook for Building aSuperior Vocabulary. Anchor, 2014.

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DEPARTMENT OFELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R20CC30E08	NANO ELECTRONICS	IV-I	Electronics and Communication Engineering	6	A, B,C & D

COURSE OUTCOMES: Students are able to

CO1: Describe the classification of Nano structures with energy bands. [K2]

CO2: Differentiate the scanning probe techniques and diffraction technique [K4]

CO3: Compare and contrast Quantum well width fluctuations and thermally annealed quantum well. [K4]

CO4: Summarize the features of carbon clusters and Nano tubes. [K2]

CO5: Differentiate the key features of NEMS and MEMS. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			Unit-1. INTRODUCTION			
1	CO 1. **Describe** the classification of Nano structures with energy bands. [K2]	1.1	Overview of Nano science and engineering	T1, R1	12	Chalk & Talk, PPT
		1.2	Development milestones in micro fabrication and electronic industry	T1, R1		Chalk & Talk
		1.3	Moore's law and continued miniaturization	T1, R1		Chalk & Talk
		1.4	Classification of Nanostructures	T2, R1		Chalk & Talk
		1.5	Simple Manipulations of Discrete–Time Signals	T1, R1		Chalk & Talk
		1.6	Electronic properties of atoms and solids	T1, R1		Chalk & Talk
		1.7	Isolated atom, Bonding between atoms, Giant molecular solids, Free electron models and energy bands, crystalline solids, Periodicity of crystal lattices,	T2, R1		Chalk & Talk
		1.8	Electronic conduction, effects of nanometer length scale	T1, R1		Chalk & Talk
			Unit-2. CHARACTERIZATION			
		2.1	Classification, Microscopic techniques	T1, R1	14	Chalk & Talk, PPT

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2	CO2. **Describe** the classification of Nano structures with energy bands. [K2]	2.2	Field ion microscopy	T1, R1		Chalk& Talk, PPT
		2.3	scanning probe technique	T1, R1		Chalk &Talk, PPT
		2.4	Diffraction techniques: bulk and surface diffraction techniques (contd...)	T1, R1		Chalk & Talk, PPT
		2.5	Diffraction techniques: bulk and surface diffraction techniques	T1, R1		Chalk & Talk, PPT
		2.6	Overview of semiconductor physics	T1, R1		Chalk & Talk, PPT
		2.7	Quantum confinement in semiconductor nanostructures:	T1, R1		Chalk & Talk, PPT
		2.8	Quantum wells	T1, R1,		Chalk & Talk, PPT
		2.9	Quantum wires	T1, R1		Chalk & Talk, PPT
		2.10	Quantum dots	R1		Chalk & Talk, PPT
		2.11	Super-lattices, band offsets	T1, R1		Chalk & Talk, PPT
3	CO3. **Compare** and contrast Quantum well width fluctuations and thermally annealed quantum well. [K4]	**Unit-3. FABRICATION TECHNIQUES**				
		3.1	Requirements of ideal semiconductor	T1,R1		Chalk & Talk, PPT
		3.2	epitaxial growth of quantum wells	T1,R1		Chalk & Talk, PPT
		3.3	lithography and etching	T1, R1		Chalk & Talk, PPT
		3.4	cleaved-edge over growth	T1, R1		Chalk & Talk,PPT
		3.5	growth of vicinal substrates	T1,R1		Chalk &Talk, PPT
		3.6	strain induced dots and wires	T1,R1		Chalk & Talk, PPT
		3.7	electrostatically induced dots and wires	T1,R1	14	Chalk & Talk, PPT
		3.8	Quantum well width fluctuations	T1,R1		Chalk & Talk, PPT
		3.9	thermally annealed quantum wells	T1,R1		Chalk & Talk, PPT
		3.10	semiconductor Nano crystals	T1,R1		Chalk & Talk, PPT
		3.11	colloidal quantum dots, self-assembly techniques	T1,R1		Chalk & Talk, PPT

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		MID I EXAMINATION				
4	CO4. **Summarize** the features of carbon clusters and Nano tubes	Unit-4. CARBON NANOSTRUCTURES				
		4.1	Carbon molecules	T2, R1	7	Chalk & Talk, PPT
		4.2	Carbon Clusters	T2, R1		Chalk & Talk, PPT
		4.3	Carbon Nanotubes	T2, R1		Chalk & Talk, PPT
		4.4	Application of Carbon Nanotubes	T2, R1		Chalk & Talk, PPT
5	CO5. **Differentiate** the key features of NEMS and MEMS	UNIT 5. NANOSENSORS				
		5.1	Introduction, Order from Chaos	T2, R1	13	Chalk & Talk, PPT,
		5.2	Characterization, Perception	T2, R1		Chalk & Talk, PPT
		5.3	Nano sensors Based On Quantum Size Effects	T2, R1		Chalk & Talk, PPT
		5.4	Electrochemical Sensors	T2, R1		Chalk & Talk, PPT
		5.5	Sensors Based On Physical Properties	T2, R1		Chalk & Talk, PPT
		5.6	Nano biosensors	T2, R1		Chalk & Talk, PPT
		5.7	Smart dust Sensor for the future	T2, R1		Chalk & Talk, PPT
		5.8	Applications: Injection lasers, quantum cascade lasers, optical memories, coulomb blockade devices, photonic structures,	T2, R1		Chalk & Talk, PPT
		5.9	single-photon sources, biological tagging,	T2, R1		Chalk & Talk, PPT
		5.10	QWIP's, NEMS, MEMS	T2, R1		Chalk & Talk, PPT
		MID II EXAMINATION				
		END EXAMINATIONS				

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Text Books:

T1: Robert Kelsall, Ian Hamley and Mark Geoghegan, Nanoscale Science and Technology, John Wiley, 2007

T2: Charles P Poole, Jr, Frank J Owens, Introduction to Nanotechnology, John Wiley, Copyright 2006, Reprint 2011

Reference Books:

R1: William A Goddard III, Donald W Brenner, Sergey E. Lyshevski and Gerald J Iafrate, Hand Book of Nanoscience Engineering and Technology, CRC Press, 2003

Signature of the Faculty **Signature of the HOD** **Signature of the Principal**

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Narasaraopeta Engineering College
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Yallmanda(Post), Narasaraopet- 522601
Department of Electronics and Communication Engineering

LESSON PLAN

Course Code	Course Title (Regulation)	Year - Semester	Branch	Contact Periods/ Week	Sections
R20CC40E08	EMBEDDED AND REAL TIME OPERATING SYSTEMS (R20)	IV - I	ECE	6	A, B, C & D

COURSE OUTCOMES:

CO1: Survey the basics of an embedded system. **[K4]**
CO2: Survey the general structure of a real-time system. **[K4]**
CO3: Develop task scheduling and task communication algorithms. **[K3]**
CO4: Develop task synchronization algorithms. **[K3]**
CO5: Identify the design methods of embedded systems. **[K3]**

Unit No.	Outcome		Topics/Activity	Ref Text Book	Total Periods	Delivery Method(s)
1	CO1: Survey the basics of an embedded system. [K4]		UNIT-I: INTRODUCTION TO EMBEDDED SYSTEMS			
		1.1	Introduction	T1, R2	1	Chalk & Talk, PPT, web resource
		1.2	Embedded system vs. General computing system	T1, R2	1	Chalk & Talk, PPT
		1.3	classification,major application areas	T1, R2	1	Chalk & Talk, PPT
		1.4	purpose of embedded systems	T1, R2	1	Chalk & Talk, PPT, web resource
		1.5	core of embedded system	T1, R2	1	Chalk & Talk, PPT
		1.6	memory	T1, R2	1	Chalk & Talk, PPT
		1.7	sensors and actuators	T1, R2	2	Chalk & Talk, PPT
		1.8	communication interface	T1, R2	2	Chalk & Talk, PPT
2	CO2: Survey the general structure of a real-time system. [K4]		UNIT-II: INTRODUCTION TO RTOS			
		2.1	Operating System basics, types, RTOS	T1, T2,R2,R3	1	Chalk & Talk, PPT, quiz
		2.2	Architecture of the Kernel, Kernel objects,	T1, T2,R2,R3	1	Chalk & Talk, PPT
		2.3	tasks/process and threads	T1, T2,R2,R3	2	Chalk & Talk, PPT, web resource
		2.4	Context Switching	T1, T2,R2,R3	1	Chalk & Talk, PPT
		2.5	Interrupt service routines- Interrupt latency	T1, T2,R2,R3	2	Chalk & Talk, PPT

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		5.7	Behavioural Synthesis	T3,R2	1	Chalk & Talk, PPT
		5.8	Systems Synthesis	T3,R2	1	Chalk & Talk, PPT
		5.9	Hardware/Software CoDesign	T3,R2	1	Chalk & Talk, PPT
				Total Classes	**60**	
MID-II EXAMINATION						
END SEMESTER EXAMINATION						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Introduction to embedded systems, Shibu. K.V, TMH, 2009.
T2	Embedded / Real Time Systems, KVKK Prasad, Dreamtech Press, 2005
T3	Embedded System Design, A Unified Hardware/Software Introduction, Frank Vahid, Tony D. Givargis, John Wiley, 2002.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	8051 Microcontroller & Embedded Systems using Assembly and C, Ayala & Gadre: Cengage
R2	Embedded Systems, Rajkamal, TMH, 2009
R3	Embedded Software Primer, David Simon, Pearson
R4	The 8051 Microcontroller and Embedded Systems, Mazidi, Pearson.

WEB SOURCE REFERENCES:

1	https://www.youtube.com/watch?v=F321087yYy4
2	https://www.youtube.com/watch?v=JIr7Xm_riRs&list=PLEBQazB0HUyQ4hAPU1cJED6t3DU0h34bz&index=2
3	https://www.youtube.com/watch?v=95yUbClyf3E&list=PLEBQazB0HUyQ4hAPU1cJED6t3DU0h34bz&index=3
4	https://www.youtube.com/watch?v=pHJ3lxOoWeI&list=PLEBQazB0HUyQ4hAPU1cJED6t3DU0h34bz&index=5
5	https://www.youtube.com/watch?v=5JcMtbA9QEE&list=PLEBQazB0HUyQ4hAPU1cJED6t3DU0h34bz&index=7

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Faculty Member **Head of the Department** **Principal**

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Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF Electronics & Communication Engineering
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R20CC4117	E&I (R20)	IV-I	ECE	5	A,B,C,D

COURSE OUTCOMES: Student is able to

CO1 : Outline the concepts of Entrepreneurship.[K2]
CO2 : Create the awareness on creativity and innovation.[K6]
CO3 : Adopt the Entrepreneurship Development programs[K6]
CO4 : Evaluate the project planning and feasibility studies.[K5]
CO5 : Analyze the concept of small and micro enterprises.[K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Outline the concepts of Entrepreneurship.[K2]		**Unit-1. Entrepreneur And Entrepreneurship**			
		1.1	Entrepreneur – Definitions, concept of entrepreneur	T1, R1	1	Chalk & Talk
		1.2	characteristics of entrepreneur, types of entrepreneurs	T1, R1	2	Chalk & Talk,PPT
		1.3	concept of entrepreneurship, characteristics of entrepreneurship	T1, R1	2	Chalk & Talk
		1.4	role of entrepreneurship in economic development	T1,R1	1	Chalk & Talk
		1.5	ethics and social responsibilities of an entrepreneur	T1,R1	2	Chalk & Talk,PPT
		1.6	Financial institutional support to entrepreneurs(IDBI,SISI,DIC,NIESBUD, Commercial banks etc.,	T1,R1	2	Chalk & Talk,PPT
2	CO2: Create the awareness on creativity and innovation.[K6]		**Unit-2. Creativity And Innovation In Entrepreneurship**			
		2.1	Meaning and concept of creativity - Nature and characteristics of creativity	T1, R1	2	Chalk & Talk,PPT
		2.2	Creativity Process- Factors affecting creativity	T1, R1	2	Chalk & Talk
		2.3	Meaning and Importance Innovation - Process	T1, R1	2	Chalk & Talk,PPT
		2.4	Distinguish the Creativity and Innovation.	T1, R1	2	Chalk & Talk
3	CO3: Adopt the Entrepreneurship Development programs[K6]		**Unit-3. Entrepreneurship Development Programmes**			
		3.1	Designing Appropriate Training Programme to inculcate Entrepreneurial Spirit	T1, R1	2	Chalk & Talk
		3.2	Training for Entrepreneurs, Entrepreneurship Development Programme (EDP)	T1, R1	2	Chalk & Talk,PPT
		3.3	Need and objectives of EDP's	T1, R1	2	Chalk & Talk
			MID I EXAMINATION			
		3.4	Phases and evolution on EDP's existing and new Entrepreneurs.	T1, R1	2	Chalk & Talk,PPT

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4	CO4: Evaluate the project planning and feasibility studies.[K5]	**Unit-4. Project Planning And Feasibility Studies**				
		4.1	Meaning of a project, Project identification – Sources of new Ideas	T2, R2	3	Chalk & Talk
		4.2	Methods of generating ideas, Project selection,	T2, R2	2	Chalk & Talk,PPT
		4.3	Project Feasibility Study -Project evaluation and Techniques	T2, R2	3	Chalk & Talk
		4.4	(PBP, ARR, NPV, IRR & PI).	T2, R2	4	Chalk & Talk
5	CO5:Analyze the concept of small and micro enterprises.[K4]	**Unit 5. Small And Micro Enterprises**				
		5.1	Importance, definitions, MSME's Development Act 2006	T2, R2	2	Chalk & Talk,PPT
		5.2	policies and their support to MSMEs	T2, R2	2	Chalk & Talk
		5.3	Growth of Firm and growth strategies,	T2, R3	2	Chalk & Talk
		5.4	Factors inducing growth	T2, R2	2	Chalk & Talk,PPT
		5.5	Sickness in small business and remedies.	T2, R3	2	Chalk & Talk
				Total	50	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1 "Entrepreneurship", Arya Kumar: Pearson, Publishing House, New Delhi, 2012.
T2 "Entrepreneurship', VSP Rao, Kuratko: Cengage Learning, New Delhi,2012
T3 ShoimoMaital, DVR Seshadri, "Innovation Management", Response Books 2007

Reference Books:

R1 "Entrepreneurship Development" B.Janakiram, M Rizwana: Excel Books, ND, 2011
R2 "Entrepreneurship Development", P.C.Shejwalkar Everest Publishing House, ND, 2011

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 52260 Department of ELECTRONICS & COMMUNICATION ENGINEERING

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
LESSON PLAN
ACADEMIC YEAR 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC1OE10	DATABASE MANAGEMENT SYSTEMS	V	Electronics & Communication Engineering	5	A,B,C&D

COURSE OUTCOMES:

After completion of this course, the students would be able to

CO1	**Classify** various Data models, Architectures and their implications. [K2]
CO2	**Analyze** DB conceptual design using ER Model. [K4]
CO3	**Interpret** how queries are being processed and executed in RDBMS. [K3]
CO4	**Analyze** various normalization process for database design. [K4]
CO5	**Compare** the various storage and indexing techniques. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1 : **Classify** various Data models, Architectures and their implications.	**Unit-1. Introduction**				
		1.1	Database system, Characteristics - Database vs. File System	T1, T2, R1	2	Chalk & Talk,PPT
		1.2	Database Users; Advantages of Data base systems, and Database applications	T1, T1, R1	2	Chalk & Talk
		1.3	Brief introduction of different Data Models	T1, T2, R1	2	Chalk & Talk
		1.4	Three tier schema architecture for data independence; Database system structure	T1, T1,	2	Chalk & Talk
		1.5	Centralized and Client Server architecture for the database.	T1, T2, R1	2	Collaborative Learning
2	CO2 **Analyze** DB conceptual design using ER Model.	**Unit-2. Entity Relationship Model**				
		2.1	Introduction, Representation of entities, attributes	T1, R2	2	Chalk & Talk
		2.2	entity set, relationship, relationship set	T1, R2	2	PPT
		2.3	Key constraints - Key constraints for Ternary Relationships	T1, T1, R1,R2	2	Collaborative Learning
		2.4	participation constraints, class hierarchies, Aggregation	T1, R2	2	Chalk & Talk,PPT
		2.5	sub classes, super class	T1, R2	2	Chalk & Talk

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		2.6	inheritance, specialization, generalization using ER Diagrams	T1, R2	2	PPT
MID I EXAMINATION DURING SIXTH WEEK						
3	CO3: **Interpret** how queries are being processed and executed in RDBMS.	**Unit-3. SQL**				
		3.1	Form of a basic SQL Query, Examples of Basic SQL Queries	T1, R2	2	Flipped Learning
		3.2	, data types, different SQL commands nested queries,	T1, R1,R3	2	QUIZ
		3.3	correlated Nested Queries, set-Comparison Operators	T1, R2	2	Chalk & Talk, PPT
		3.4	sub queries, grouping, aggregate operators	T1, R2	2	PPT
		3.4	sub queries, grouping, aggregate operators	T1, R1,R2	2	NPTEL
		3.5	different types of joins, view, relational set operations	T1, R1,R2	2	Chalk & Talk
		3.6	Integrity constraints in SQL - Domain constraints	T1, R1,R2	2	Chalk & Talk,PPT
		3.7	Entity constraints, Referential integrity constraints	T1, R1,R2	2	Chalk & Talk
4	CO4: **Analyze** various normalization process for database design.	**Unit-4. Schema Refinement (Normalization)**				
		4.1	Problems Caused by Redundancy, Decompositions	T1, R2	2	Chalk & Talk
		4.2	Problems Related to Decomposition, Functional dependency	T1, R2	2	Flipped Learning
		4.3	Properties of Functional dependency	T1, R1	2	Chalk & Talk
		4.4	, Normal forms based on functional dependency - 1NF, 2NF and 3NF.	T1,R2	2	Chalk & Talk,PPT
5	CO5: **Compare** the various storage and indexing techniques.	**Unit 5 Overview of Storage and Indexing**				
		5.1	Data on External Storage File Organization and Indexing	T1, R2	2	PPT
		5.2	Index data Structures Tree Structured Indexing	T1, R2	2	Chalk & Talk
		5.3	Indexed Sequential Access Methods (ISAM), B+ Trees: A Dynamic index Structure	T1, R2	2	Chalk & Talk, PPT
MID II EXAMINATION DURING EIGHTEENTH WEEK END EXAMINATIONS						

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WEB RESOURCES	
1	nptel.ac.in/courses/106106093
2	nptel.ac.in/courses/106104135

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Raghuram Krishnan, Johannes Gehrke, "Database Management Systems", TMH, 3/e, 2008.
T2	Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", PEA, 6/e, 2011.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Silberschatz, Korth, "Database System Concepts", TMH, 6/e, 2010.
R2	C J Date, "Introduction to Database Systems", PEA, 8/e, 2006.
R3	Database System Concepts, Peter ROB, Coronel, Ceneage, 6/2, 2011.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Year - Semester	Branch	Contact Periods/Week	Sections
R23EC2101	PROBABILITY THEORY AND STOCHASTIC PROCESS (R23)	II - I	ECE	6	A, B, C, D, E, F

COURSE OUTCOMES:

After completion of this course, students would be able to

CO1. Understanding of concept of random variable. (K2)
CO2. Calculate the expectation of different random variables. (K3)
CO3. Calculate the operations of multiple random variables. (K3)
CO4.Understanding types of random processes. (K2)
CO5. Understanding of random processes and its spectral characteristics. (K2)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1 Understanding of concept of random variable. (K2)		**Unit-1: PROBABILITY AND RANDOM VARIABLE**			
		1.1	Probability introduced through Sets and Relative Frequency: Experiments and Sample Spaces, Discrete and Continuous Sample Spaces, Events	T1, R1,R3	2	Chalk & Talk, PPT
		1.2	Probability Definitions and Axioms, Joint Probability, Conditional Probability	T1, R1,R3	2	Chalk & Talk, Tutorial
		1.3	Total Probability, Bay's Theorem, Independent Events	T1, R1,R3	2	Chalk & Talk, Tutorial
		1.4	Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete, Continuous and Mixed Random Variables	T1, R1,R3	3	Chalk & Talk, PPT
		1.5	Distribution and Density functions, Properties	T1, R1,R3	2	Chalk & Talk, PPT
		1.6	Binomial, Poisson, Uniform, Gaussian, Exponential, Rayleigh	T1, R1,R3	2	Chalk & Talk, PPT
		1.7	Conditional Distribution, Conditional Density, Properties.	T1, R1,R3	2	Chalk & Talk, PPT
2	CO2 Calculate the expectation of different random variables .(K3)		**Unit-2: OPERATION ON ONE RANDOM VARIABLE – EXPECTATIONS**			
		2.1	Introduction, Expected Value of a Random Variable, Function of a Random Variable	T1, R2,R3	2	Chalk & Talk, PPT
		2.2	Moments about the Origin, Central Moments, Variance and Skew	T1, R2,R3	2	Chalk & Talk, Tutorial
		2.3	Chebychev's Inequality, Characteristic Function, Moment Generating Function	T1, R2,R3	2	Chalk & Talk, Tutorial
		2.4	Transformations of a Random Variable: Monotonic Transformations for a Continuous Random Vari...	T1, R2,R3	3	Chalk & Talk, PPT

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Text Books:

T1 PeytonZ. Peebles, "Probability, Random Variables & Random Signal Principles", TMH, 4th edition, 2001

T2 Athanasios Papoulis and S.Unnikrisha, "Probability, Random Variables and Stochastic Processes", PHI, 4th Edition, 2002

Reference Books:

R1 B. Prabhakara Rao, "Probability Theory and Stochastic Processes", Oxford University Press.

R2 Henry Stark and John W. Woods, "Probability and Random Processes with Applications to Signal Processing", Pearson Education, 3rd Edition

R3 George R. Cooper, Clave D. Mc Gillem, "Probabilistic Methods of Signal & System Analysis", Oxford, 3rd Edition, 1999

R4 S. P. Eugene Xavier, "Statistical Theory of Communication", New Age Publications, 2003.

R5 B.P. Lathi, "Signals, Systems & Communications", B.S. Publications, 2003.

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	CREDITS	Contact Periods/Week	Section
R23CC2201	MEFA (R23)	II-II	ECE	2	4	A,B,C,D,E,F

COURSE OUTCOMES:

CO 1: Define the concepts related to Managerial Economics, financial accounting and management (L2)
CO 2: Understand the fundamentals of Economics viz., Demand, Production, cost, revenue and markets (L2)
CO 3: Apply the Concept of Production cost and revenues for effective Business decision (L3)
CO 4: Analyze how to invest their capital and maximize returns (L4)
CO 5: Evaluate the capital budgeting techniques. (L5)
CO 6: Develop the accounting statements and evaluate the financial performance of business entity (L5)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT-1 – Managerial Economics			
1	CO-1:Define the concepts related to Managerial Economics, financial accounting and management (L2)	1.1	Meaning & Nature of ME	T1, R2	2	Chalk & Talk
		1.2	significance, functions of ME	T2, R2	2	Chalk & Talk,PPT
		1.3	Advantages of ME	T2, R2	1	Chalk & Talk
		1.4	Demand-Concept, Function	T2, R2	1	Tutorial
		1.5	Law of Demand	T2, R2	1	Chalk & Talk,PPT
		1.6	Demand Elasticity- Types	T2, R2	2	Chalk & Talk,PPT
		1.7	Demand Measurement	T2, R2	1	Tutorial
		1.8	Demand Forecasting Factors governing Forecasting,	T1, R2	1	Chalk & Talk,PPT
		1.9	Demand Forecasting Methods	T2, R1	1	Web Resourses
		1.10	Managerial Economics and Financial Accounting and Management	T1, R2	1	Tutorial
			UNIT-2 - Production and Cost Analysis			
	CO 2: Understand the fundamentals of Economics viz., Demand, Production,	2.1	Introduction – Nature	T2, R2	1	Chalk & Talk,PPT
		2.2	meaning, significance	T2, R2	1	Chalk & Talk
		2.3	functions and advantages	T2, R2	2	Chalk & Talk,PPT

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	cost, revenue and markets (L2)	2.4	Production Function	T2, R2	1	Tutorial
		2.5	Least- cost combination	T1, R1	1	Chalk & Talk,PPT
		2.6	Short run Production Function	T2, R2	1	Chalk & Talk,PPT
		2.7	long run Production Function	T2, R2	1	Tutorial
		2.8	Isoquants and Is costs	T2, R2	1	Web Resourses
		2.9	Cost & Break-Even Analysis	T2, R2	1	Chalk & Talk,PPT
		2.10	Cost concepts and Cost behaviour	T2, R2	1	Tutorial
		2.11	Break-Even Analysis (BEA)	T1, R3	1	Chalk & Talk,PPT
		2.12	Determination of Break-Even Point (Simple Problems).	T2, R2	3	Chalk & Talk,PPT
3	CO-3:Apply the Concept of Production cost and revenues for effective Business decision (L3)	**UNIT-3 - Business Organizations and Markets**				
		3.1	Introduction – Forms of Business Organizations	T2,R2	1	Chalk & Talk
		3.2	Sole Proprietary	T2,R2	1	Chalk & Talk,PPT
		3.3	Partnership	T2,R2	1	Chalk & Talk,PPT
		3.4	Joint Stock Companies	T2,R2	1	Tutorial
		3.5	Public Sector Enterprises	T2,R2	1	Web Resourses
		MID I EXAMINATION				
		3.6	Types of Markets	T2,R2	1	Chalk & Talk,PPT
		3.7	Perfect and Imperfect Competition	T1,R2	1	Chalk & Talk,PPT
		3.8	Features of Perfect Competition Monopoly-	T2,R3	1	Chalk & Talk,PPT
		3.9	Monopolistic Competition	T2,R2	1	Web Resourses
		3.10	Oligopoly-Price-Output Determination	T2,R2	1	Tutorial
		3.11	Pricing Methods and Strategies	T1,R4	2	Chalk & Talk,PPT
	CO 4: Analyze how to invest their capital and maximize returns (L4) CO-5: Evaluate the capital budgeting	**UNIT-4 - Capital Budgeting**				
		4.1	Introduction – Nature,	T2,R2	1	Chalk & Talk
		4.2	meaning, significance	T2,R2	1	Chalk & Talk,PPT
		4.3	Types of Working Capital, Components	T2,R2	2	Web Resourses

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	techniques. (L5)	4.4	Sources of Short-term and Long-term Capital,	T2,R2	1	Tutorial
		4.5	Estimating Working capital requirements.	T2,R2	1	Chalk & Talk,PPT
		4.6	Capital Budgeting– Features, Proposals	T2,R2	1	Chalk & Talk,PPT
		4.7	Methods and Evaluation	T2,R2	1	Tutorial
		4.8	Projects- Pay back Method, Accounting Rate of Return (ARR)	T2,R2	3	Chalk & Talk,PPT
		4.9	Net Present Value (NPV) Internal Rate Return (IRR) Method (sample problems)	T2,R2	3	Chalk & Talk,PPT
		UNIT-5 - Financial Accounting and Analysis				
5	CO 6: Develop the accounting statements and evaluate the financial performance of business entity (L5)	5.1	Introduction – Concepts and Conventions	T2,R2	2	Chalk & Talk,PPT
		5.2	Double-Entry Bookkeeping	T2,R2	1	Chalk & Talk
		5.3	Journal	T2,R2	3	Chalk & Talk,PPT
		5.4	Ledger	T2,R2	2	Tutorial
		5.5	Trial Balance	T2,R2	2	Chalk & Talk,PPT
		5.6	Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).	T2,R2	4	Web Resourses
		5.7	Introduction to Financial Analysis	T2,R2	1	Tutorial
		5.8	Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability.	T2,R2	4	Chalk & Talk,PPT
				Total	73	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Textbooks:-

1. Varshney & Maheswari: Managerial Economics, Sultan Chand.

2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

Reference Books:-

1. Ahuja Hl Managerial economics Schand.

2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International.

3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi.

4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage.

Faculty

P. Pattabhi Ram

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R23EC2202	LINEAR CONTROL SYSTEMS (R23)	II/II	Electronics and Communications Engineering	5	A,B,C,D,E.F

COURSE OUTCOMES: After completion of this course, Students will be able to

CO1. Apply the knowledge of mathematical concepts to obtain transfer function of various systems.(K3)

CO2. Analyze the performance of a linear time invariant system in Time Domain(K4)

CO3. Analyze the stability of the closed and open loop systems (K4)

CO4. Formulate different types of analysis in frequency domain (K3)

CO5. Analyze state space models (K4)

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
1	CO1.Apply the knowledge of mathematical concepts to obtain transfer function of various systems.(K3)	UNIT – I INTRODUCTION				
		1.1	Open Loop and closed loop control systems and their differences	T1, T2, R1	2	Chalk & Talk
		1.2	Different examples of control systems	T1, T2, R1	1	Chalk & Talk
		1.3	Feed-Back Characteristics	T1, T2, R2	2	Chalk & Talk
		1.4	Effects of feedback	T1, T2, R2,R4	1	Chalk & Talk
		1.5	Mathematical models Differential equations	T1, T2, R2,R4	2	Chalk & Talk
		1.6	Impulse Response and transfer functions	T2, R2 R3,R4	1	Chalk & Talk, PPT Tutorials.
		1.7	Translational and Rotational mechanical systems	T1, T2, R2,R3	2	Chalk & Talk, Tutorials.
		1.8	Transfer Function of DC Servo motor - AC Servo motor- Synchro-transmitter	T1, T2, R2,R3	2	Chalk & Talk, Tutorials
		1.9	Block diagram algebra		2	Chalk & Talk,
		1.10	Representation by Signal flow graph-		2	Chalk & Talk,
		1.12	Reduction using mason's gain formula		2	Chalk & Talk,
		ASSIGNEMENT EXAM-I				

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4		4.4	Nyquist Stability Criterion	T1, T2, R2,R3,R4	2	Chalk & Talk, PPT
		4.4	Compensation techniques – Lag, Lead	T1, T2, R2,R3	2	Chalk & Talk, PPT
		4.5	Lead-Lag Controllers	T1,T2, R2,R3	2	Chalk & Talk, PPT
5	**UNIT–V: State Space Analysis**					
	CO5 Analyze state space models (K4)	5.1	Concepts of state, state variables and state model	T1, T2, R2	1	Chalk & Talk, PPT
		5.2	Derivation of state models from block diagrams	T1, T2, R2	1	Chalk & Talk,
		5.3	Diagonalization	T1, T2, R2	1	Chalk & Talk,
		5.4	Solving the Time invariant state Equations	T1, T2, R2	1	Chalk & Talk,
		5.5	State Transition Matrix	T1, T2, R2	1	Chalk & Talk,
		5.6	Properties of State Transition Matrix	T1, T2, R2	1	Chalk & Talk,
		5.7	Concepts of Controllability	T1, T2, R2	1	Chalk & Talk,
		5.8	Concepts of Observability	T1, T2, R2	1	Chalk & Talk Tutorial
			Revision		1	Chalk & Talk Tutorial
				Total	**60**	
			MID II EXAMINATIONS			
			END EXAMINATIONS			

Text Books:

T1 Automatic Control Systems 8th edition– by B.C.Kuo – Johnwiley and son's, 2003.

T2 Control Systems Engineering –by I. J.Nagrathand M.Gopal, New Age

T3 International (P) Limited, Publishers, 2nd edition, 2007
Modern Control Engineering–by Katsuhiko Ogata–Pearson Publications, 5th edition, 2015.

Reference Books:

R1 Control Systems by A.Nagoorkani, RB Apublications, 3 edition, 2017.

R2 Control Systems by A.Anandkumar, PHI, 2 Edition, 2014

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Narasaraopeta Engineering College
(Autonomous)
Yallmanda(Post), Narasaraopet- 522601
Department of Electronics and Communication Engineering

LESSON PLAN

Course Code	Course Title (Regulation)	Year - Semester	Branch	Contact Periods/ Week	Sections
R23EC2203	**Electromagnetic Waves & Transmission Lines (R20)**	II-II	ECE	5	A, B, C, D, E & F

COURSE OUTCOMES:

CO1: Apply the concepts of Electric and Magnetic Fields in different applications **(K3)**.
CO2: Apply Maxwell's equations in electromagnetics **(K3)**.
CO3: Understand wave propagation and derive the Wave Equations in Perfect Dielectric and Conducting Media **(K1)**.
CO4: Understand wave characteristics - reflection and refraction of Electromagnetic Waves in different media and analyze different transmission lines and applications **(K1)**.

Unit No.	Outcome		Topics/Activity	Ref Text Book	Total Periods	Delivery Method(s)
1	CO1: **Apply** the concepts of Electric and Magnetic Fields in different applications **[K3]**.	**UNIT–I: REVIEW OF COORDINATE SYSTEMS & STATIC FIELDS**				
		1.1	Overview of EM waves and Transmission Lines	T1, T2	1	Chalk & Talk, PPT, Quiz
		1.2	Columb's Law	T1, T2	1	Chalk & Talk, PPT, Quiz
		1.3	Electric Field Intensity, Electric Flux Density	T1, T2	1	Chalk & Talk, PPT, Quiz
		1.4	Gauss Law and its Applications	T1, T2	1	Chalk & Talk, PPT, Quiz
		1.5	Electric Field Intensity due to Point Charge	T1, T2	1	Chalk & Talk, PPT, Quiz
		1.6	Infinite Line Charge	T1, T2	1	Chalk & Talk, PPT, Quiz
		1.7	Electric Field Intensity due to Infinite Sheet of Charge	T1, T2	1	Chalk & Talk, PPT, Quiz, Web Resources
		1.8	Uniformly Charged Sphere, Problems	T1, T2	1	Chalk & Talk, PPT, Quiz, Problem based Learning
		1.9	Electric Potential: Electric Potential due to Point Charge and Infinite Line Charge	T1, T2	1	Chalk & Talk, PPT, Quiz
		1.10	Energy Density	T1, T2	1	Chalk & Talk, PPT, Quiz
		1.11	Poison's and Laplace's Equations	T1, T2	1	Chalk & Talk, PPT, Quiz, Web Resources
		1.12	Introduction to Magneto statics,	T1, T2	1	Chalk & Talk,

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			Biot-Savart Law			PPT, Quiz
		1.13	Ampere's Law, Applications	T1, T2	1	Chalk & Talk, PPT
		1.14	Introduction to Magnetic Flux Density	T1, T2	1	Chalk & Talk, PPT, Quiz
		1.15	Magnetic Vector Potential, Quiz questions & Problems	T1, T2	2	Chalk & Talk, Problem based Learning
ASSIGNEMENT EXAM-I						
		UNIT–II: MAXWELL'S EQUATIONS				
2	**CO2: Apply** Maxwell's equations in electromag-netics **[K3]**.	2.1	Faraday's Law	T1, T2	1	Chalk & Talk, PPT, Quiz
		2.2	Transformer EMF	T1, T2	1	Chalk & Talk, PPT, Quiz, Web Resources
		2.3	Inconsistency of Ampere's Law	T1, T2	1	Chalk & Talk, PPT, Quiz, Web Resources
		2.4	Displacement Current Density	T1, T2, R2	1	Chalk & Talk, PPT, Quiz
		2.5	Continuity Equation	T1, T2, R2	1	Chalk & Talk, PPT, Quiz
		2.6	Differential Forms	T1, T2, R1	1	Chalk & Talk, PPT, Quiz
		2.7	Maxwell's Equations in Integral Forms	T1, T2, R1	1	Chalk & Talk, PPT, Quiz
		2.8	Word Statements for Static and Time varying fields of Electric and Magnetic	T1, T2, R1	1	Chalk & Talk, PPT, Quiz
		2.9	Quiz questions & Problems	T1, T2, R1	2	Chalk & Talk, PPT, Quiz,
MID-I EXAMINATION						
		UNIT–III: EM WAVES				
3	**CO3: Understand** wave propagation and derive the Wave Equations in Perfect Dielectric and Conducting Media **[K1]**	3.1	Types of Media: Wave Propagation in Perfect Dielectrics	T1, T2, R1	1	Chalk & Talk, PPT, Quiz, Web Resources
		3.2	Wave Propagation in Lossy (General Case-Conducting) media	T1, T2, R1	1	Chalk & Talk, PPT, Quiz
		3.3	Uniform Plane Waves-Definition,	T1, T2, R1	1	Chalk & Talk, PPT, Quiz
		3.4	Uniform Plane Wave Propagation in Free Space	T1, T2, R1	1	Chalk & Talk,
		3.5	Uniform Plane Wave Propagation in Conducting Media	T1, T2, R1	1	PPT, Quiz
		3.6	Types of Media: Wave Propagation in Perfect Dielectrics	T1, T2, R1	1	Chalk & Talk,
		3.7	Conductors –Characterization	T1, T2, R1	1	PPT, Quiz
		3.8	Dielectrics –Characterization	T1, T2, R1	1	Chalk & Talk,
		3.9	Poynting Vector and Poynting Theorem	T1, T2, R1	1	PPT, Quiz
		3.10	Electric Boundary Conditions	T1, T2, R1	1	Chalk & Talk,
		3.11	Magnetic Boundary Conditions	T1, T2, R1	1	Chalk & Talk, PPT, Quiz
		3.12	Polarization	T1, T2, R1	1	Chalk & Talk, PPT, Quiz

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		3.13	Reflection of Plane Waves	T1, T2, R1	1	Chalk & Talk, PPT, Quiz
		3.14	Refraction of Plane Waves	T1, T2, R1	1	Chalk & Talk, PPT, Quiz
		3.15	Problems on Reflection	T1, T2, R1	1	Chalk & Talk, PPT, Quiz
		3.16	Problems on Refraction	T1, T2, R1	1	Chalk & Talk, PPT, Quiz
		3.17	Brewster Angle	T1, T2, R1	1	Chalk & Talk,
		3.18	Critical Angle	T1, T2, R1	1	PPT, Quiz
		3.19	Total Internal Reflection	T1, T2, R1	1	Chalk & Talk,
		3.20	Quiz questions & Problems	T1, T2, R1	2	Chalk & Talk, Problem based Learning
ASSIGNEMENT EXAM-II						
		UNIT–IV: TRANSMISSION LINES-I				
4	**CO4: Understand** wave characteristics - reflection and refraction of Electromagnetic Waves in different media and analyze different transmission lines and applications **[K4]**	4.1	Types, Parameters	T1, T2, R2	1	Chalk & Talk, PPT, Quiz
		4.2	Transmission Line Equations	T1, T2, R2	1	Chalk & Talk, PPT, Quiz,
		4.3	Primary and Secondary Constants	T1, T2, R3	1	Chalk & Talk, PPT, Quiz
		4.4	Expressions for Characteristic Impedance	T1, T2, R3	1	Chalk & Talk, PPT, Quiz
		4.5	Propagation Constant, Phase and Group Velocities	T1, T2, R3	1	Chalk & Talk, PPT, Quiz, Web Resources
		4.6	Infinite Line Concepts	T1, T2, R3	1	Chalk & Talk, PPT, Quiz
		4.7	Lossless/Low Loss Characterization.	T1, T2, R3	1	Chalk & Talk, PPT, Quiz,
		4.8	Distortion: Condition for Distortion less and Minimum Attenuation	T1, T2, R3	1	Chalk & Talk, PPT, Quiz
		4.9	Loading-Types of Loading	T1, R3	1	Chalk & Talk, PPT, Quiz
		4.10	Quiz questions & Problems	T1, R3	1	
		UNIT–V: TRANSMISSION LINES-II				
5	**CO4 Understand** wave characteristics - reflection and refraction of Electromagnetic Waves in different media and analyze different transmissio	5.1	Input impedance relations	T1, T2, R1, R3	1	Chalk & Talk, PPT, Quiz
		5.2	SC and OC Lines.	T1, T2, R1, R3	1	Chalk & Talk, PPT, Quiz
		5.3	Reflection Coefficient.	T1, T2, R1, R3	1	Chalk & Talk, PPT, Quiz
		5.4	VSWR	T1, T2, R1, R3	1	Chalk & Talk, PPT, Quiz
		5.5	UHF Lines as Circuit Elements: $\lambda/4$, $\lambda/2$, $\lambda/8$ Lines.	T1, T2, R1, R3	1	Chalk & Talk, PPT, Quiz
		5.6	UHF Lines as Circuit Elements: $\lambda/2$ and $\lambda/8$ Lines.	T1, T2, R1, R3	1	Chalk & Talk, PPT, Quiz
		5.7	Quiz questions & Problems	T1, T2, R1, R3	1	Chalk & Talk, PPT

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	n lines and applications [K4]					
				Total Classes	64	
MID-II EXAMINATION						
END SEMESTER EXAMINATION						

TEXT BOOKS	
T	BOOK TITLE/AUTHORS/PUBLISHER
T1	Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI Second Edition, 2000.
T2	Elements of Electromagnetics – Mathew N.O. Sadiku, Oxford Univ.Press, Third Edition, 2001.
REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Electromagnetic Field Theory and Transmission Lines – G. Sai Bhushana Rao, Wiley India Pvt Ltd, 2012.
R2	Electromagnetics – J.D. Kraus, Keith R. Carver, TMH, Third Edition, 1984. Transmission Lines and Networks – Umesh Sinha, Satya Prakashan (Tech. India Publications), New Delhi, 2010.
R3	Electromagnetic Field Theory and Transmission Lines – G. Sai Bhushana Rao, Wiley India Pvt Ltd, 2012.

WEB SOURCE REFERENCES:

1	http://jntuk-coeerd.in/faculty_subjects.php
2	http://nptel.ac.in/courses/115101005/
3	http://www.scribd.com/collections/3218090/electromagnetics
4	http://ocw.mit.edu/resources/res-6-001-electromagnetic-fields-and-energy-spring-2008/
5	http://www.transmission-line.net/search/label/Electromagnetics

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Faculty Member

Head of the Department

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R23EC2204	Electronic Circuit Analysis (R23)	II/II	Electronics and Communications Engineering	4	A,B,C,D,E.F

COURSE OUTCOMES: After completion of this course, Students will be able to

1. **Design** and **analysis** of small signal high frequency transistor amplifier Using BJT and FET (K4).
2. **Design** and **analysis** of multistage amplifiers using BJT and FET (K5).
3. **Describe** the negative feedback amplifier and derive their characteristics (K5)
4. **Derive** the expressions for frequency of oscillation and condition for Oscillation of RC and LC oscillators and their amplitude and frequency Stability concepts.(K5)
5. **Know** the classification of the power and tuned amplifiers and their Analysis with performance comparison (K1)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1. **Design** and **analysis** of small signal high frequency transistor amplifier Using BJT and FET (K4).		**UNIT – I TRANSISTOR AMPLIFIERS ANALYSIS**			
		1.1	Two port devices and the Hybrid Model.	T1, T2, R1	2	Chalk & Talk
		1.2	Transistor Hybrid Model	T1, T2, R1	1	Chalk & Talk
		1.3	Analysis of a transistor amplifier circuit using h-parameters	T1, T2, R2	2	Chalk & Talk
		1.4	Conversion of h-parameters, Comparison of Transistor amplifier configurations	T1, T2, R1,R2	1	Chalk & Talk
		1.5	Simplified Common Emitter hybrid model	T1, T2, R1,R2	2	Chalk & Talk
		1.6	FET small signal model, Low frequency Common Source FET Amplifier	T1, T2, R1,R2	1	Chalk & Talk, PPT Tutorials.
		1.7	Transistor at high frequencies	T1, T2, R2,R3	2	Chalk & Talk, Tutorials.
		1.8	Two port devices and the Hybrid Model.	T1, T2, R1,R2	2	Chalk & Talk, Tutorials
		1.9	Hybrid- π common emitter transistormodel	T1, T2, R1,R2	2	Chalk & Talk,
		1.10	High frequency analysis of CE amplifier (with & without resistive load)	T1, T2, R1,R2	2	Chalk & Talk,

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4	UNIT – IV: OSCILLATORS					
	CO4 **Derive the expressions for frequency of oscillation and condition for Oscillation of RC and LC oscillators and their amplitude and frequency Stability concepts.(K5)**	4.1	Oscillator principle and condition for oscillation	T1, T2, R1,R2	1	Chalk & Talk
		4.2	Types of oscillators	T1, T2, R1,R2	1	Chalk & Talk, PPT
		4.3	RC phase shift oscillator using BJT	T1, T2, R1,R2	1	Chalk & Talk
		4.4	Wien bridge oscillator using BJT	T1, T2, R1,R2	2	Chalk & Talk, PPT
		4.4	Generalized analysis of LC oscillators-load impedance	T1, T2, R1,R2	2	Chalk & Talk, PPT
		4.5	Hartley and Colpitt's oscillators using BJT	T1, T2, R1,R2	2	Chalk & Talk, PPT
5	UNIT–V: POWER AMPLIFIERS& TUNED AMPLIFIER					
	CO5 **Know** the classification of the power and tuned amplifiers and their Analysis with performance comparison (K1)	5.1	Class A power Amplifiers and their analysis	T1, T2, R2	1	Chalk & Talk, PPT
		5.2	Class B Push-pull amplifiers and their analysis	T1, T2, R2	1	Chalk & Talk,
		5.3	Complementary symmetry push pull amplifier	T1, T2, R2	1	Chalk & Talk,
		5.4	Class AB and Class C power amplifier	T1, T2, R2	1	Chalk & Talk,
		5.5	Q-factor, small signal tuned amplifier	T1, T2, R2	1	Chalk & Talk,
		5.6	Double tuned amplifiers	T1, T2, R2	1	Chalk & Talk,
		5.7	Effect of cascading single tuned amplifiers on band width	T1, T2, R2	1	Chalk & Talk,
		5.8	Effect of cascading double tuned amplifiers on band width.	T1, T2, R2	1	Chalk & Talk Tutorial
			Revision		1	Chalk & Talk Tutorial
				Total	**60**	
	MID II EXAMINATIONS					
	END EXAMINATIONS					

Text Books:

T1 Integrated Electronics- J.Millman and C.C.Halkias, Tata McGraw-Hill, 1972.

T2 Electronic Devices and CircuitsTheory –Robert L.Boylestad and Louis Nashelsky,Pearson/PrenticeHall, TenthEdition, 2009.

Reference Books:

R1 Electronic Circuit Analysis and Design –Donald A.Neaman, McGrawHill, 2010.

R2 Micro electronic Circuits-Sedra A.S. and K.C. Smith, Oxford University Press, SixthEdition, 2011.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23EC2205	ANALOG COMMUNICATIONS (R23)	IV	Electronics and Communication Engineering	5	A,B,C,D,E & F

COURSE OUTCOMES: After completion of this course, the students would be able to

CO1: Describe the Modulation and Demodulation techniques of standard AM.**[K1]**
CO2: Compare different types of Amplitude Modulation and Demodulation techniques.**[K2]**
CO3: Analyze the concepts of generation and detection of Angle Modulated signals, Outline the Radio Receivers with different sections. **[K4]**
CO4: Interpret the Radio Transmitters completely.**[K2]**
CO5: Illustrate the noise performance in Analog Modulation techniques and also the concepts of Pulse Analog Modulation and Demodulation techniques.**[K2]**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Describe the Modulation and Demodulation techniques of standard AM.[K1]		**UNIT I: Amplitude Modulation:**			
		1.1	Introduction to Fourier transform, Introduction to communication system, Need for modulation.	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		1.2	Frequency Division Multiplexing, Amplitude Modulation	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		1.3	Time domain and Frequency domain descriptions	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		1.4	Single tone modulation, Power relations in AM waves	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		1.5	Generation of AM waves - Square law Modulator, Switching modulator	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial

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		1.6	Detection of AM Waves: Square law detector, Envelope detector	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial & Quiz
		1.7	Problems	T1, T2, R1	1	Chalk & Talk, Tutorial
2	**CO2:** Compare different types of Amplitude Modulation and Demodulation techniques. **[K2]**	**UNIT II: DSB & SSB Modulation:**				
		2.1	Double side band suppressed carrier modulator -Time domain and frequency domain description, Generation of DSBSC Waves -Balanced Modulator, Ring Modulator	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		2.2	Detection of DSBSC Waves: Coherent detection,Quadrature Null Effect, COSTAS Loop, Squaring Loop.	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		2.3	Single side band suppressed carrier modulator: Time domain and Frequency domain description	T1, T2, R1	2	Chalk &Talk, PPT & Tutorial
		2.4	Generation of SSBSC Waves: Frequency discrimination method, Phase discrimination method	T1, T2, R1	2	Chalk &Talk, PPT & Tutorial
		2.5	Demodulation of SSB Waves: Coherent Detection	T1, T2, R1	2	Chalk &Talk, PPT & Tutorial
		2.6	Vestigial side band modulation: Time domain description	T1, T2, R2	2	Chalk & Talk, PPT & Tutorial
		2.7	Frequency domain description, Generation of VSB Modulated wave	T1, T2, R2	2	Chalk & Talk, PPT & Tutorial
		2.8	Envelope detection of a VSB Wave pulse Carrier, Comparison of different AM Techniques, Applications of different AM Systems	T1, T2, R2	2	Chalk & Talk, PPT, Tutorial & Quiz
		2.9	Problems	T1, T2, R2	1	Chalk & Talk, PPT

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						& Tutorial
3	**CO3:** Analyze the concepts of generation and detection of Angle Modulated signals.[K4]	**UNIT III :Angle Modulation:**				
		3.1	Introduction, Basic concept of phase modulation, Frequency Modulation: Single tone frequency modulation	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		3.2	Spectrum Analysis of Sinusoidal FM Wave, Narrow band FM	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		3.3	Wide band FM, Constant Average Power Transmission bandwidth of FM Wave	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		3.4	Generation of FM Waves: Direct Method, Indirect Method,	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial & Quiz
			MID I EXAMINATION			
		3.5	Detection of FM Waves: Balanced Frequency discriminator	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		3.6	Zero crossing detector, Phase locked loop	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		3.7	Comparison of FM & AM	T1, T2, R1	1	Chalk & Talk, PPT, Tutorial & quiz
		3.8	Problems	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
4	**CO4:** Outline the Radio Receivers with different sections & Interpret the Radio Transmitters	**UNIT IV: Radio Transmitters & Receivers**				
		4.1	**Radio Transmitters -** Classification of Transmitters, AM Transmitter, Effect of feedback on performance of AM Transmitter	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		4.2	**FM Transmitters -** Variable reactance type and Phase modulated FM Transmitter, Frequency stability in FM Transmitter	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		4.3	**Radio Receivers:** Receiver Types: Tuned radio frequency	T1, T2, R1	1	Chalk &

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	completely.[K2]		receiver, Super hetero dyne receiver			Talk, PPT & Tutorial
		4.4	RF section and Characteristics, Frequency changing and tracking, Intermediate frequency	T1, T2, R2	2	Chalk & Talk, PPT & Tutorial
		4.5	AGC, FM Receiver, Amplitude limiting, Comparison of FM & AM Receivers	T1, T2, R2	2	Chalk & Talk, PPT & Tutorial
		4.6	Communication Receivers, Extension of super hetero dyne principle and additional circuits.	T1, T2, R2	2	Chalk & Talk, PPT,, Tutorial & Quiz
		4.7	problems	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
5	**CO5:** Illustrate the noise performance in Analog Modulation techniques and also the concepts of Pulse Analog Modulation and Demodulation techniques.[K2]	**UNIT V :Noise & Pulse Analog Modulation:**				
		5.1	Review of noise and noise sources, Noise figure	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		5.2	Noise in Analog Communication Systems: Noise in DSB & SSB Systems	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		5.3	Noise in AM System and Noise in Angle Modulation Systems	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		5.4	Threshold effect in Angle Modulation System	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		5.5	Pre-emphasis & De-emphasis.	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		5.6	Pulse Analog Modulation-Types of Pulse modulation, PAM - Single polarity, double polarity	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		5.7	PWM Generation & Detection of PWM	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial & Quiz

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		5.8	PPM: Generation and Detection of PPM, Time Division Multiplexing, TDM Vs FDM. problems	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
				Total	60	
MID II EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS:

1. Communication Systems, Simon Haykin, Michael Moher, Wiley, 5th Edition, 2009.
2. Principles of Communication Systems, H Taub, D L Schilling, Gautam Sahe, TMH, 4th Edition,2017.
3. Modern Digital and Analog Communication Systems, B.P.Lathi, Zhi Ding, Hari Mohan Gupta,Oxford University Press, 4th Edition, 2017.

REFERENCES:

1. Electronics & Communication Systems, George Kennedy, Bernard Davis, S R M Prasanna,TMH, 6th Edition, 2017.
2. Communication Systems, R P Singh, S D Sapre, TMH, 3rd Edition, 2017.
3. Communication Systems (Analog and Digital), Dr. Sanjay Sharma, Katson Books, 7th Reprint Edition, 2019.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OFELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20EC3101	Linear & Digital IC Applications	I	Electronics and Communication Engineering	6	A,B,C &D

COURSE OUTCOMES: Students are able to

CO1: **Recall** the basics of FET, MOSFET, amplifiers, standard memories and their characteristics **(K1)**
CO2: **Extend** the logic gate concept to realize basic combinational and sequential circuits for various Boolean expressions **(K2)**
CO3: **Illustrate** the operation of IC 555 timer, utilization of filters, VCO, data converters and PLL in the development of various circuits **(K4)**
CO4: **Demonstrate** the applications of Operational amplifier and IC 555 timer such as Adder, Subtractor, V-I, I-V converter, Differentiator, Integrator, and Triangular, Square wave generators, PWM, PPM generation respectively **(K3)**
CO5: **Make use** of the computer-aided design tools for development of complex digital logic circuits **(K3)**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 4. **Demonstrate** the applications of Operational amplifier and IC 555 timer such as Adder, Subtractor, V-I, I-V converter, Differentiator, Integrator, and Triangular, Square wave generators, PWM, PPM generation respectively **(K3)**		**UNIT I: OPERATIONAL AMPLIFIER AND ITS APPLICATIONS**			
		1.1	Introduction to Linear Integrated Circuits and IC types	T1, T2, R3	12	Chalk & Talk,
		1.2	Ideal Operational amplifier and characteristics, op-amp internal circuit.	T1, T2, R3		Chalk & Talk,
		1.3	Op-amp AC & DC characteristics	T1, T2, R3		Chalk & Talk,
		1.4	Frequency Compensation Techniques	T1, T2, R3		Chalk & Talk,
		1.5	Analysis of data sheets of IC 741	T1, T2, R3		Chalk & Talk,
		1.6	Op amp applications: Inverting and non-inverting op -amp.	T1, T2, R3		Chalk & Talk,
		1.7	Adder, Subtractor	T1, T2, R3		Chalk & Talk,
		1.8	V to I and I to V convertors	T1,T2		Chalk & Talk,
		1.9	Log and Anti Log Amplifiers	T1, T2, R3		Chalk & Talk,
		1.10	Integrator and Differentiator	T1, T2, R3		Chalk & Talk,
		1.11	Sample& Hold Circuit	T1, T2, R3		Chalk & Talk,
		1.12	Triangular & Square wave generator	T1,T2		Chalk & Talk,
2			**UNIT II: D-A AND A-D CONVERTERS**			
		2.1	Need for A-D and D-A converters, Performance Characteristics	T1, T2, R3	10	Chalk & Talk,

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	CO3. **Illustrate** the operation of IC 555 timer, utilization of filters, VCO, data converters and PLL in the development of various circuits **(K4)**	2.2	DAC Techniques, Binary Weighted Resistor DAC	T1, T2, R3		Chalk & Talk,
		2.3	R-2R Inverter ladder DAC	T1, T2, R3		Chalk & Talk,
		2.4	R-2R Ladder DAC	T1, T2, R3		Chalk & Talk
		2.5	IC 1408, Problems	T1, T2, R3		Chalk & Talk,
		2.6	Tutorials	T1, T2, R3		Chalk & Talk, PPT & Quiz
		2.7	ADC Technics, Dual slope, Successive Approximation ADC	T1, T2, R3		Chalk & Talk,
		2.8	Flash & Counter type ADC, Problems	T1, T2, R3		Chalk & Talk,
		2.9	IC555 Timer, pin diagram, Functional Discretion	T1,T2, R3		Chalk & Talk, PPT & Quiz
		2.10	Monostable & Astable operation	T1, T2, R3		Chalk & Talk, PPT & Quiz
3	CO 3. **Illustrate** the operation of IC 566 VCO, utilization of filters, VCO, data converters and PLL in the development of various circuits **(K4)**		**UNIT III:ACTIVE FILTERS,VCO & PHASE LOCKED LOOP**			
		3.1	Introduction of Active filters, First order Butterworth LPF, HPF	T1,T2, R3		Chalk & Talk, PPT
		3.2	First order Butterworth BPF, BRF.	T1,T2, R3		Chalk & Talk, PPT
		3.3	Second Order Butterworth LPF	T1,T2, R3		Chalk & Talk, PPT
		3.4	Second Order Butterworth HPF	T1,T2, R3		Chalk & Talk, PPT
	MID - I EXAMINATION					
		3.5	Tutorial	T1,T2, R3	07	Chalk & Talk, PPT
		3.6	VCO,IC566,pin and block diagram description	T1,T2, R3		Chalk & Talk, PPT
		3.7	IC565 PLL pin and block diagram description.	T1,T2, R2		Chalk & Talk, PPT & Quiz
4	CO 2. **Extend** the logic gate concept to realize basic combinational and sequential circuits for various Boolean expressions **(K2)**.		**UNIT IV: DIGITAL LOGIC FAMILIES AND INTERFACING**			
		4.1	Introduction to Logic families, CMOS logic	T1, T2, R3		Chalk & Talk, PPT & Tutorials
		4.2	CMOS steady state and dynamic electrical behavior	T1, T2, R3		Chalk & Talk, PPT & Tutorials
		4.3	Tutorial	T1, T2, R3		Chalk & Talk, PPT
		4.4	CMOS logic families, Bipolar logic	T1, T2, R3	12	Chalk & Talk, PPT
		4.5	TTL families	T1, T2, R3		Chalk & Talk, PPT
		4.6	ECL	T1, T2, R3		Chalk & Talk, PPT
		4.7	Comparison of COM,ECL,TTL, Tutorial	T1, T2, R3		Chalk & Talk, PPT, Cooperative Learning

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5	CO 5. **Make use** of the computer-aided design tools for development of complex digital logic circuits **(K3)**	UNIT V: DESIGN OF COMBINATIONAL & SEQUENTIONAL LOGIC CIRCUITS				
		5.1	Ripple adders and Subs tractors 74999,283	T1, T2, R3	10	Chalk & Talk, PPT
		5.2	Decoders	T1, T2, R3		Chalk & Talk, PPT
		5.3	Encoders, Priority encoder	T1, T2, R3		Chalk & Talk, PPT
		5.4	Multiplexers, DE multiplexers			Chalk & Talk, PPT
		5.4	Parity circuits, Comparators	T1, T2, R3		Chalk & Talk, PPT
		5.5	Single floating Point encoder, Flip-Flops	T1, T2, R3		Chalk & Talk, PPT & Web resources
		5.6	Tutorial	T1, T2, R3		Chalk & Talk, PPT & Quiz
		5.7	Design of Counters	T1, T2, R3		Chalk & Talk, PPT
		5.8	Registers (MSI, Shift, Bi-Directional)	T1, T2, R3		Chalk & Talk, PPT
		5.9	VHDL, Design Flow Program Structure Modeling Styles	T1, T2, R3		Chalk & Talk, PPT & Quiz
		5.10	Example Programs	T1, T2, R3		PPT & Tutorials
MID III EXAMINATION						
END EXAMINATIONS						

Text Books:

T1 D.Roy Choudhury,ShailB.Jain,—LinearIntegratedCircuits,4thMultiColourEdition, New Age International (p) Ltd, 2010.

T2 JohnF.Wakerly, — Digital Design Principles & Practicesl, 3rdEdition, PHI/Pearson Education Asia, 2005.

Reference Books:

R1 Ramakanth, A. Gayakwad, —OP-Amps & Linear ICs, PHI, 1987.
R2 J. Bhasker, —VHDL Primer, 3rdEdition, Pearson Education/ PHI
R3 AtulP.Godseand Deepali A.Godse, —Digital IC Applications, Technical Publ., Pune, 2005.

Principal HOD Faculty

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DEPARTMENT OFELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Semester	Branch	Contact Periods/Week	Sections
R20EC3103	Digital Signal Processing (R20)	V	Electronics and Communication Engineering	6	A, B, C, D

COURSE OUTCOMES: Students are able to

CO1: Analyze the signals and system in Time and Frequency domain through transformations. **[K4]**

CO2: Solve DFT and IDFT coefficients of a given discrete time sequence using Fast Fourier Transform algorithm. **[K3]**

CO3: Examine the significance of various filter structures and responses. **[K3]**

CO4: Construct the digital filter circuits for generating desired signal wave shapes. **[K4]**

CO5: Inspect the rmance of a variety of windowing techniques. **[K3]**

Unit No	Course Outcome		Topics/Activity	Ref. Text book	Total Periods	Delivery Method
1	CO 1. Analyze ... signal and System in Time and Frequency domain through transformations [K4]		**UNIT-1: INTRODUCTION**			
		1.1	Introduction	T1, R1	13	Chalk & Talk
		1.2	Review of Discrete Time Signals	T1, R1		Chalk & Talk
		1.3	Some Elementary Discrete-Time Signals	T1, R1		Chalk & Talk
		1.4	Classification of Discrete–Time Signals	T2, R1		Chalk & Talk
		1.5	Simple Manipulations of Discrete–Time Signals	T1, R1		Chalk & Talk
		1.6	Discrete Time Systems: Input-Output Description of Systems	T1, R1		Chalk & Talk
		1.7	Block Diagram Representation of Discrete-Time Systems and Classifications.	T2, R1		Chalk & Talk
		1.8	Frequency domain representation of Discrete Time Signals and Systems	T1, R1		Chalk & Talk
		1.9	Discrete-Time Fourier Transform (DTFT):	T1, R1		Chalk & Talk
		1.10	Existence of DTFT, properties of DTFT.	T2, R1		Chalk & Talk
2	CO2. Solve DFT and IDFT coefficients of a given discrete time sequence using Fast Fourier Transfc algoritl..... [K3]		**UNIT-2: DISCRETE FOURIER SERIES & DISCRETE FOURIER TRANSFORMS**			
		2.1	Discrete Fourier series	T1, R1	13	Chalk & Talk
		2.2	Properties of Discrete Fourier Series	T1, R1		Chalk & Talk
		2.3	DFS representation of periodic sequences.	T1, R1		Chalk & Talk
		2.4	DFT: Properties of DFT, Computation of DFT	T1, R1		Chalk & Talk
		2.5	Circular & Linear Convolution of Sequences using DFT	T1, R1		Chalk & Talk
		2.6	FAST FOURIER TRANSFORMS: Radix-2 Fast Fourier Transforms.	T1, R1		Chalk & Talk
		2.7	Decimation in Time FFT Algorithms	T1, R1		Chalk & Talk

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		2.8	Decimation in Frequency FFT Algorithms	T1, R1,		Chalk & Talk, PPT
		2.9	Inverse FFT	T1, R1		Chalk & Talk
		2.10	Additional Problems	R1		Chalk & Talk
		2.11	Review of Z-Transforms	T1, R1		Chalk & Talk
		2.12	Problems.	R1		Chalk & Talk
			UNIT-3: REALIZATION OF IIR & FIR FILTERS			
3	**CO3.** **Examine the significance of various filter structures and responses. [K3]**	3.1	Block Diagram Representation of Linear Constant Coefficient Difference Equations	T1, R1	14	Chalk & Talk, PPT
		3.2	Basic structures of IIR systems: Direct form-I realization	T1, R1		Chalk & Talk, PPT
		3.3	Direct form-II realization, transposed	T1, R1		Chalk & Talk
		3.4	cascade form, parallel form	T1, R1		Chalk & Talk
			MID I EXAMINATION			
		3.4	Lattice structures of IIR systems, Conversion from Lattice structure to direct form and vice-versa	T1, R1		Chalk & Talk, PPT
		3.5	Basic structures of FIR systems: Transversal structure, Linear phase	T1, R1		Chalk & Talk, PPT
		3.6	Lattice structure, Polyphase Lattice structures of FIR systems	T1, R1		Chalk & Talk, PPT
		3.7	Conversion from Lattice structure to direct form and vice-versa.	T1, R1		Chalk & Talk, PPT
			UNIT-4: IIR DIGITAL FILTERS			
4	**CO4.** **Construct the digital filter circuits for generating desired signal wave shapes. [K4]**	4.1	Analog filters approximations: Butterworth.	T2, R1	14	Chalk & Talk, PPT
		4.2	Analog filters approximations Chebyshev.	T2, R1		Chalk & Talk, PPT
		4.3	Design of IIR digital filters from analog filters, Design examples	T2, R1		Chalk & Talk, PPT
		4.4	Frequency Transformations in Analog Domain: Low pass to Low pass filter, Low pass to High pass filter,	T2, R1		Chalk & Talk, PPT
		4.5	Low pass to Band pass filter, and Low pass to Band stop filter.	T2, R1		Chalk & Talk, PPT
		4.6	Frequency Transformations in digital domain: Low pass to Low pass filter.	T2, R1		Chalk & Talk, PPT
		4.7	Low pass to High pass filter, Low pass to Band pass filter, and Low pass to Band stop filter.	T2, R1		Chalk & Talk, PPT
			UNIT-5: FIR DIGITAL FILTERS			
5	**CO5.** **Inspect the performance of a variety of windowing techniques. [K3]**	5.1	Characteristics of FIR Digital Filters	T2, R1	14	Chalk & Talk
		5.2	Frequency Response	T2, R1		Chalk & Talk
		5.3	Design of FIR Digital Filters Using Window Techniques	T2, R1		Chalk & Talk, PPT
		5.4	Rectangular Window	T2, R1		Chalk & Talk, PPT
		5.5	Triangular or Bartlett Window	T2, R1		Chalk & Talk, PPT
		5.6	Raised Cosine Window Hanning Window	T2, R1		Chalk & Talk, PPT
		5.7	Blackman Window	T2, R1		Chalk & Talk, PPT
		5.8	Kaiser Window	T2, R1		Chalk & Talk, PPT

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		5.9	Frequency Sampling Technique: Frequency Sampling Realization	T2, R1		Chalk & Talk, PPT
		5.10	Frequency Response, Design, Comparison of IIR and FIR filter	T2, R1		Chalk & Talk, PPT
Total Classes: 68						
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

T1	John G. Proakis, Dimitris G. Manolakis, —Digital signal processing, principles, Algorithms and applications, 4th Edition, Pearson Education/PHI, 2007.
T2	A.V. Oppenheim and R.W. Schaffer, —Discrete Time Signal Processingl, 2nd Edition, PHI, 2008.

Reference Books:

R1	Ramesh Babu, —Digital Signal Processingl, SciTech Publications, 2011.
R2	Andreas Antoniou, —Digital signal processingl, TATA McGraw Hill, 20063.
R3	R S Kaler, M Kulkarni,, Umesh Gupta, —A Text book on Digital Signal processingl, I K International Publishing House Pvt. Ltd, 2010.

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Narasaraopeta Engineering College
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Department of Electronics and Communication Engineering

LESSON PLAN

Course Code	Course Title (Regulation)	Year - Semester	Branch	Contact Periods/Week	Sections
R20EC3106	ELECTRONIC MEASUREMENTS AND INSTRUMENTATION (R20)	III-I	ECE	6	A, B, C & D

COURSE OUTCOMES:

COURSE OUTCOMES: After going through this course, the student will be able to

CO1: List out Electronic Instruments, their Characteristics and use, Peculiar Errors Associated with the Instruments and how to minimize such Errors. [K1]

CO2: Identify with transducers, electrical and electronic instruments. [K2]

CO3: Apply the Principle of Operation of Electronic Measuring Instruments. [K3]

CO4: Illustrate various concepts of electronic instruments. Computer controlled test systems. [K4]

CO5: constructed Storage and display instruments for experimenting and Analysis the working & uses of Electronic voltmeter & Multimeter, Digital multimeter, Q meter [K5]

Unit No.	Outcome		Topics/Activity	Ref Text Book	Total Periods	Delivery Method(s)
1	CO1: List out Electronic Instruments, their Characteristics and use, Peculiar Errors Associated with the Instruments and how to minimize such Errors. [K1]		**UNIT–I: BASIC MEASUREMENTS**			
		1.1	Functional Elements of measurement system	T2, R1	1	Chalk & Talk, PPT, Quiz
		1.2	Characteristics of instruments	T2, R1	1	Chalk & Talk, PPT, Quiz
		1.3	Static characteristics,	T2, R1	1	Chalk & Talk
		1.4	Dynamic characteristics	T2, R1	1	Chalk & Talk, Quiz
		1.5	Types of errors, sources of errors	T2, R1	1	Chalk & Talk
		1.6	methods of eliminating Errors	T1,R2	1	Chalk & Talk
		1.7	Mean, Measure of dispersion from the mean	T1,R2	1	Chalk & Talk, PPT, Quiz, Web Resources
		1.8	Range Deviation Average deviation Standard Deviation	T1,R2	1	Chalk & Talk, Problem based Learning
		1.9	Variance, Bourdon Tubes.	T1,R2	1	Chalk & Talk, PPT, Quiz
		1.10	Histogram	T1,R2	1	Chalk & Talk
2	CO2: Identify		**UNIT–II: TRANSDUCERS**			
		2.1	Classification of Transducers, Characteristics	T1, R1		Chalk & Talk, PPT, Quiz

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	with transducers, electrical and electronic instruments . [K2]	2.2	Basic Requirements of a Transducer	T1, R1	1	Chalk & Talk, PPT, Quiz, Web Resources
		2.3	Resistive Transducer	T1, R1	1	Chalk & Talk, PPT, Quiz, Web Resources
		2.4	Strain Gauge		1	Chalk & Talk, PPT, Quiz
		2.4	Strain Gauge	T1, R1	1	Chalk & Talk, PPT, Quiz
		2.5	Inductive Transducer	T1, R1	1	Chalk & Talk, PPT, Quiz
		2.6	Capacitive displacement transducer	T1, R1	1	Chalk & Talk, PPT, Quiz
		2.7	LVDT	T1, R1	1	Chalk & Talk, PPT, Quiz
		2.8	Load cell Transducers, Thermocouple, Thermistor	T1, R1	1	Chalk & Talk, PPT, Quiz
		2.9	Radiation Pyrometers	T1, R1	1	Chalk & Talk, PPT, Quiz
3	CO3: Apply the Principle of Operation of Electronic Measuring Instruments . [K3]	**UNIT–III: ELECTRICAL MEASUREMENTS**				
		3.1	Measurement of Voltage and Current	T1, R2	1	Chalk &Talk, PPT, Web Resources
		3.2	D'Arsonval Galvanometer, permanent magnet moving coil	T1, R2	1	Chalk & Talk, PPT, Quiz
		3.3	permanent magnet moving iron, Dynamometer	T1, R2	1	Chalk & Talk, PPT, Quiz
		3.4	Measurement of Resistance, Inductance and Capacitance	T1, R2	1	Chalk & Talk, PPT, Quiz
		3.5	Measurement of Inductance	T1, R2	1	Chalk & Talk
		3.6	Measurement of Capacitance	T1, R2	1	PPT, Quiz
		MID-I EXAMINATION				
		3.7	Wheat stone bridge	T1, R2	1	Chalk & Talk,
		3.8	Kelvin double bridge	T1, R2	1	PPT, Quiz
		3.9	Wien Bridge	T1, R2	1	Chalk & Talk
		3.10	Hay's bridge	T1, R2	1	Chalk & Talk
		3.11	Maxwell bridge	T1, R2	1	Chalk & Talk
		3.12	Anderson bridge	T1, R2	1	Chalk & Talk
		3.13	Q- Meter	T1, R2	1	Chalk & Talk, PPT, Quiz
		3.14	Schering bridge	T1, R2	1	Chalk & Talk, PPT, Quiz,
		3.15	Ohmmeter.	T1, R2	1	Chalk & Talk, PPT, Quiz
		3.7	Wheat stone bridge	T1, R2	1	Chalk & Talk, PPT, Quiz
		3.8	Kelvin double bridge	T1, R2	1	Chalk & Talk
		3.9	Wien Bridge	T1, R2	1	Chalk & Talk
4	CO4: Illustrate various concepts of electronic instruments . Computer	**UNIT–IV: ELECTRONIC MEASUREMENTS**				
		4.1	Signal generators: Function Generator	T1, R2	1	Chalk & Talk, PPT, Quiz
		4.2	RF Signal Generator	T1, R2	1	Chalk & Talk,
		4.3	Random Noise Generator	T1, R2	1	Chalk & Talk, PPT, Quiz

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	controlled test systems. [K4]	4.4	Sweep generators,	T1, R2	1	Chalk & Talk, PPT, Quiz
		4.5	Wave Analyzers	T1, R2	1	Chalk & Talk, PPT
		4.6	Harmonic distortion	T1, R2	1	Chalk & Talk, PPT, Quiz
		4.7	Distortion Analyzer, Spectrum Analyzer	T1, R2	1	Chalk & Talk, PPT, Quiz,
		4.8	DC & AC Voltmeters,	T1, R2	1	Chalk & Talk, PPT, Quiz
		4.9	Digital Voltmeters, Electronic Multimeters,	T1, R2	2	Chalk & Talk, PPT, Quiz
		4.10	VOM meters	T1, R2	1	Chalk & Talk, PPT, Quiz
		4.11	Measurement of physical parameters force	T1, R2	1	Chalk & Talk, PPT, Quiz
		4.12	pressure, velocity	T1, R2	1	Chalk & Talk, PPT, Quiz
		4.13	humidity	T1, R2	1	Chalk & Talk, PPT, Quiz
		4.14	Data acquisition systems	T1, R2	1	Chalk & Talk, PPT, Quiz
		UNIT–V: STORAGE AND DISPLAY INSTRUMENTS				
5	**CO5** **Identify** the characteristics of wave propagation in atmospheric conditions **[K3].**	5.1	Cathode Ray Oscilloscopes – CRT Circuit,	T1, R1	2	Chalk & Talk, PPT, Quiz
		5.2	Vertical Deflection System, Delay Line	T1, R1	1	Chalk & Talk, PPT, Quiz
		5.3	Horizontal Deflection System	T1, R1	1	Chalk & Talk, PPT, Quiz
		5.4	Oscilloscope Techniques	T1, R1	1	Chalk & Talk, PPT, Quiz
		5.5	Special Oscilloscopes	T1, R1	1	Chalk & Talk, PPT, Quiz
		5.6	Special Oscilloscopes	T1, R1	1	Chalk & Talk, PPT, Quiz
		5.7	Recorders -XY	T1, R1	1	Chalk & Talk, PPT, Quiz
		5.8	Magnetic Tape Dot Matrix Display	T1, R1	1	Chalk & Talk, PPT, Quiz
				Total Classes	60	
MID-II EXAMINATION						
END SEMESTER EXAMINATION						

TEXT BOOKS:

1. A.K.Sawhney,l Electrical, Electronic measurement & Instrumentationl, 18th Edition, Dhanpat Rai & Sons, Reprint 2010

2. Albert.D.Helfrick & William.D.Cooper,-Modern Electronic Instrumentation & Measurement Techniquesl, PHI , 2003.

Reference Books:

1. E.W. Golding and F.C. Widdis, Electrical Measurements and measuring Instrumentsl, 5th Edition, AH Wheeler & Company, 1993.

2. Alan Morris, "Principles of Measurements & Instrumentation", 2nd Edition, PHI, 2003.

3. R. K. Rajput, —Electronic Measurements & Implementationl, S. Chand Publications, 2012

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Head of the Department

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN- A.Y 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC32MC1	PEHV (R20)	III/I	ECE	8	A,B,C&D

COURSE OUTCOMES: Student is able to

CO1: Learn necessary behavioural skills relating to the Ethics at industrial sector and to gain fundamental knowledge [K2].
CO2: Acquaint with basic human values, responsibilities and rights of engineers which are very much necessary today [K2].
CO3: Equip with knowledge on basics of intellectual property rights and cyber law [K2].
CO4: Gain knowledge on the patents, trademark and copy rights [K2].
CO5: Summarise the engineer's responsibilities towards safety and risk. [K2].

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	Learn necessary behavioural skills relating to the Ethics at industrial sector and to gain fundamental knowledge [K2].		**Unit-1. Human Values**			
		1.1	Ethics, Morals, Values, Integrity,	T1, R1	1	Chalk & Talk
		1.2	Work Ethics- Service Learning	T1, R1	1	Chalk & Talk
		1.3	Civic Virtue- Respect for Others- Living Peacefully	T1, R1	1	Chalk & Talk
		1.4	Caring- Sharing- Honesty- Courage- Value Time	T1,R1	1	Chalk & Talk
			Cooperation- Commitment – Empathy- Self-Confidence- Spirituality- Character.	T1,R1	1	Chalk & Talk,PPT
2	Acquaint with basic human , responsibilities and rights ineers which are very much ary today [K2].		**Unit-2. Engineering Ethics**			
		2.1	Professional Roles to Be Played By Engineer	T1, R1	1	Chalk & Talk
		2.2	Engineers Role As Managers,	T1, R1	1	Chalk & Talk
		2.3	Consultants And Leaders- Ethical Theories And Its Uses.	T1, R1	2	Chalk & Talk,PPT
3	Equip with knowledge on basics of intellectual property rights and cyber law [K2].		**Unit-3. Principles for Harmony**			
		3.1	Truthfulness – Customs and Traditions	T1, R1	1	Chalk & Talk
		3.2	Value Education – Human Dignity	T1, R1	1	Chalk & Talk,PPT
		3.3	Human Rights –Fundamental Duties	T1, R1	1	Chalk & Talk
		3.4	Aspirations and Harmony (I, We & Nature) – Gender Bias – Emotional Intelligence	T1, R1	1	Chalk & Talk
		3.5	Salovey – Mayer Model – Emotional Competencies – Conscientiousness.	T1, R1	2	Chalk & Talk
	MID I EXAMINATION DURING EIGTH WEEK					
4			**Unit-4. Engineers' Duties and Rights**			
		4.1	Concept of Duty - Professional Duties –	T2, R2		Chalk &

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	Gain knowledge on the s, trademark and copy rights		Collegiality			Talk
		4.2	Techniques for Achieving Collegiality – Senses of Loyalty	T2, R2	1	Chalk & Talk
		4.3	Consensus and Controversy - Professional and Individual Rights	T2, R2	1	Chalk & Talk
		4.4	Confidential and Proprietary Information - Conflict of Interest-Ethical egoism	T2, R2	1	Chalk & Talk,PPT
		4.5	Collective Bargaining – Confidentiality - Gifts and Bribes	T2, R2	1	Chalk & Talk
		4.6	Problem solving-Occupational Crimes	T2, R2	1	Chalk & Talk
		4.7	Industrial Espionage- Price Fixing-Whistle Blowing	T2, R2	1	Chalk & Talk
5	Summarise the engineer's responsibilities towards safety and risk. [K2].	**Unit 5. Engineers' Responsibilities towards Safety and Risk**				
		5.1	Concept of Safety - Safety and Risk	T2, R2	1	Chalk & Talk,PPT
		5.2	Types of Risks – Voluntary v/s Involuntary Risk	T2, R2	1	Chalk & Talk
		5.3	Consequences - Risk Assessment – Accountability	T2, R2	1	Chalk & Talk
		5.4	Liability - Reversible Effects	T2, R2	1	Chalk & Talk
		5.5	Threshold Levels of Risk - Delayed v/s Immediate Risk	T2, R2	1	Chalk & Talk
		5.6	Safety and the Engineer	T2, R2	1	Chalk & Talk
		5.7	Designing for Safety – Risk-Benefit Analysis-Accidents.	T2, R2	1	Chalk & Talk
				Total	30	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Professional Ethics and Morals, Prof. A.R.Aryasri, Dharanikota Suyodhana, 1/e, Maruthi Publications.
T2	Intellectual property , Deborah e. Bouchoux, 1/e, Cengage learning, New Delhi.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Kompal Bansal & Parishit Bansal" Fundamentals of IPR for Engineers BS Publications.
R2	Cyber Law. Texts & Cases, South- western's special topics collections.
R3	M. Ashok kumar and mohd. Iqbal Ali: "Intellectual property right" serials pub.
R4	"Engineering Ethics and Human Values" by M. Govindarajan, S. Natarajan and V.S. Senthil kumar- PHI Learning PVT. Ltd-2009

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R23CC2102	UHV-II(R23)	II-I	ECE	3	

COURSE OUTCOMES: Student is able to

CO1: : Define the terms like Natural Acceptance, Happiness and Prosperity (K1)

CO2: Identify one's self, and one's surroundings (family, society nature) (K4)

CO3: Apply what they have learnt to their own self in different day-to-day settings in real life (K3)

CO4: Relate human values with human relationship and human society. (K6)

CO5: Justify the need for universal human values and harmonious existence (K5)

CO6: Develop as socially and ecologically responsible engineers.(K6)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Define the terms like Natural Acceptance, Happiness and Prosperity		**Unit-1. Introduction to Value Education**			
		1.1	Right Understanding, Relationship and Physical Facility	T1,R1	1	Chalk & Talk
		1.2	Understanding Value Education	T1R1	1	Chalk & Talk,PPT
		1.3	Practice Session PS1 Sharing about Oneself (PS1)	T1, R1	1	Presentation by student
		1.4	Self-exploration as the Process for Value Education	T1,R1	1	Chalk & Talk
		1.5	Continuous Happiness and Prosperity – the Basic Human Aspirations	T1,R1	1	Chalk & Talk,PPT
		1.6	Practice Session PS2 Exploring Human Consciousness(PS2)	T1,R1	1	Presentation by student
		1.7	Happiness and Prosperity – Current Scenario	T1,R1	1	Chalk & Talk,PPT
		1.8	Method to Fulfill the Basic Human Aspirations	T1,R1	1	Chalk & Talk,PPT
		1.9	Practice Session PS3 Exploring Natural Acceptance(PS3)	T1,R1	1	Presentation by student
2	CO2: Identify one's self, and one's surroundings (family, society nature)		**Unit-2. Harmony in the Human Being**			
		2.1	Understanding Human being as the Co-existence of the self and the body.	T1, R1	1	Chalk & Talk,PPT
		2.2	Distinguishing between the Needs of the self and the body	T1, R1	1	Chalk & Talk

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		2.3	Practice Session PS4 Exploring the difference of Needs of self and body.(PS4)	T1, R1	1	Chalk & Talk,PPT
		2.4	The body as an Instrument of the self	T1, R1	1	Chalk & Talk
		2.5	Practice Session PS5 Exploring Sources of Imagination in the self (PS5)	T1, R1	1	Presentation by student
		2.6	Harmony of the self with the body	T1, R1	1	Chalk & Talk
		2.7	Programme to ensure self-regulation and Health	T1, R1	1	Chalk & Talk
		2.8	Session PS6 Exploring Harmony of self with the body	T1, R1	1	Presentation by student
3	CO3: Apply what they have learnt to their own self in different day-to-day settings in real life.	**Unit-3. Harmony in the Family and Society**				
		3.1	Harmony in the Family – the Basic Unit of Human Interaction	T1, R1	1	Chalk & Talk
		3.2	Trust' – the Foundational Value in Relationship	T1, R1	1	Chalk & Talk,PPT
		3.3	Practice Session PS7 Exploring the Feeling of Trust	T1, R1	1	Presentation by student
		3.4	Respect – as the Right Evaluation	T1, R1	1	Chalk & Talk
		3.5	Practice Session PS8 Exploring the Feeling of Respect	T1, R1	1	Presentation by student
		3.6	Other Feelings, Justice in Human-to-Human Relationship	T1, R1	1	Chalk & Talk
		3.7	Understanding Harmony in the Society	T1, R1	1	Chalk & Talk
		3.8	Vision for the Universal Human Order	T1, R1	1	Chalk & Talk
		3.9	Practice Session PS9 Exploring Systems to fulfil Human Goal	T1, R1	1	Presentation by student
		MID I EXAMINATION				
4		**Unit-4 Harmony in the Nature/Existence**				
		4.1	Understanding Harmony in the Nature	T1,R1	1	Chalk & Talk
		4.2	Interconnectedness, self-regulation	T1,R1	1	Chalk & Talk

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	CO4:Relate human values with human relationship and human society, Justify the need for universal human values and harmonious existence		and Mutual Fulfilment among the Four Orders of Nature			
		4.3	Practice Session PS10 Exploring the Four Orders of Nature	T1,R1	1	Presentation by student
		4.4	Realizing Existence as Co-existence at All Levels	T1,R1	1	Chalk & Talk
		4.5	The Holistic Perception of Harmony in Existence	T1,R1	1	Chalk & Talk
		4.6	Practice Session PS11 Exploring Co-existence in Existence	T1,R1	1	Presentation by student
5	CO5: Justify the need for universal human values and harmonious existence, Develop as socially and ecologically responsible engineers	**Unit 5. Implications of the Holistic Understanding – a Look at Professional Ethics**				
		5.1	Natural Acceptance of Human Values	T1,R1	1	Chalk & Talk
		5.2	Definitiveness of (Ethical) Human Conduct	T1,R1	1	Chalk & Talk
		5.3	Practice Session PS12 Exploring Ethical Human Conduct	T1,R1	1	Presentation by student
		5.4	A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order	T1,R1	1	Chalk & Talk
		5.5	Competence in Professional Ethics	T1,R1	1	Chalk & Talk
		5.6	Practice Session PS13 Exploring Humanistic Models in Education	T1,R1	1	Presentation by student
		5.7	Holistic Technologies, Production Systems and Management Models-Typical Case Studies	T1,R1	1	Chalk & Talk
		5.8	Strategies for Transition towards Value-based Life and Profession	T1,R1	1	Chalk & Talk
		5.9	Practice Session PS14 Exploring Steps of Transition towards Universal Human Order	T1,R1	1	Presentation by student
				Total	42	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

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Textbook:

1.R R Gaur, R Asthana, G P Bagaria, a Foundation Course in Human Values and Professional s, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1.

Reference:

1. JeevanVidya: EkParichaya, A Nagaraj, JeevanVidya Prakashan, Amarkantak, 1999.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Year - Semester	Branch	Contact Periods/Week	Sections
R23EC2103	SIGNALS & SYSTEMS (R23)	II - I	ECE	6	A, B, C, D,E,F

COURSE OUTCOMES:

After completion of this course, the students would be able to

CO1 : Define basic signals and its operations. (K1).
CO2 : Identify Trigonometric and Exponential Fourier Series functions in signals.(K3)
CO3 : Develop Fourier Transforms for various signals.(K3)
CO4 : Solve Laplace Transform and z-Transform for various signals.(K3)
CO5 : Compare LTI system responses for different inputs and illustrate sampling concepts.(K4)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1 Define basic signals and its operations. (K1)	**Unit-1: SIGNAL ANALYSIS & SAMPLING:**				
		1.1	Classification of Signals: Analog, Discrete, Digital, Deterministic & Random, Periodic & Aperiodic, Even & Odd, Energy & Power signals...	T1, R1,R3	2	Chalk & Talk, PPT
		1.2	Basic Operations on Signals: Time-Shifting, Time-Scaling, Time-Reversal, Amplitude Scaling and Signal Addition	T1, R1,R3	2	Chalk & Talk, Tutorial
		1.3	Elementary Signals: Unit Step, Unit Ramp, Unit Parabolic, Impulse, Sinusoidal function, Exponential function, Gate function, Triangular function, Sinc function and Signum function.	T1, R1,R3	3	Chalk & Talk, Tutorial
		1.4	Convolution,Correlation, Relation between Cross & Auto correlation.	T1, R1,R3	2	Chalk & Talk, PPT
		1.5	Sampling theorem, Types of Sampling: Impulse Sampling, Natural and flat top Sampling	T1, R1,R3	3	Chalk & Talk, PPT
		1.6	Reconstruction of signal from its samples, Effect of under sampling – Aliasing	T1, R1,R3	2	Chalk & Talk, PPT
2	CO2 Identify Trigonometric and Exponential Fourier Series functions in signals.(K3)	**Unit-2: ORTHOGONAL FUNCTIONS & FOURIER SERIES:**				
		2.1	**Orthogonal Functions:** Signal approximation using orthogonal functions, Mean square error, Orthogonality in complex functions.	T1, R1,R3	3	Chalk & Talk, PPT
		2.2	**FOURIER SERIES** : Representation of Fourier series , Continuous time periodic signals, Properties of Fourier Series	T1, R1,R3	2	Chalk & Talk, Tutorial
		2.3	Dirichlet's conditions	T1, R1,R3	1	Chalk & Talk, Tutorial
		2.4	Trigonometric Fourier Series and Exponential Fourier Series	T1, R1,R3	3	Chalk & Talk, PPT
		2.5	Conversion of Exponential Fourier Series from Trigonometric Fourier series & vice versa	T1, R1,R3	3	Chalk & Talk, PPT

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3	CO3 Develop Fourier Transforms for various signals.(K3)	**Unit-3: FOURIER TRANSFORMS**				
		3.1	Deriving Fourier Transform from Fourier series	T1, R1,R3	2	Chalk & Talk, PPT
		3.2	Fourier Transform of arbitrary signal	T1, R1,R3	2	Chalk & Talk, Tutorial
		3.3	Fourier Transform of standard and periodic signals	T1, R1,R3	3	Chalk & Talk, Tutorial
		MID I EXAMINATIONS				
		3.4	Properties of Fourier Transform	T1, R1,R3	2	Chalk & Talk, PPT
		3.5	Fourier Transforms involving Impulse function and Signum function, Introduction to Hilbert Transform	T1, R1,R3	3	Chalk & Talk, PPT
4	CO 4 Solve Laplace Transform and z-Transform for various signals. (K3)	**Unit-4: LAPLACE TRANSFORMS AND Z- TRANSFORMS**				
		4.1	Laplace transforms, Partial fraction expansion, Inverse Laplace transform, Concept of Region of Convergence (ROC), Constraints on ROC for various classes of signals	T3, R1,R3	3	Chalk & Talk, PPT, & Tutorial
		4.2	Properties of Laplace transforms, Relation between Laplace transform and Fourier transform	T3, R1,R3	2	Chalk & Talk, Tutorial
		4.3	**Z-Transforms:** Concept of Z-transform of a discrete sequence, Region of convergence in Z-Transform,	T3, R1,R3	3	Chalk & Talk, Tutorial
		4.4	Constraints on ROC for various classes of signals, inverse Z-transform.	T3, R1,R3	2	Chalk & Talk, PPT
		4.5	Properties of Z-Transforms	T3, R1,R3	2	Chalk & Talk, PPT
5	CO 5 Compare LTI system responses for different inputs and illustrate sampling concepts. (K4)	**Unit-5. SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS**				
		5.1	System and its types: Linear & Non-Linear, Time Variant & Time Invariant, Causal & Non Causal, Static & Dynamic, Stable & Unstable.	T1, R1,R3	4	Chalk & Talk, PPT, & Tutorial
		5.2	Impulse response of a linear time invariant (LTI) system and linear time variant (LTV) system, Transfer function of a LTI system, Filter characteristics of linear systems	T1, R1,R3	4	Chalk & Talk, PPT, & Tutorial
		5.3	Distortion less transmission through a system, Signal bandwidth, System bandwidth, Ideal LPF, HPF and BPF and its characteristics, Causality and Paley-Wiener criterion for physical realization, Relationship between bandwidth and rise time.	T1, R1,R3	4	Chalk & Talk, PPT, & Tutorial
				Total		**62**
MID II EXAMINATIONS						
END EXAMINATIONS						

Text Books:

T1 Signals, Systems & communications – B.P.Lathi, BS Publications, 2008.
T2 Signals & Systems – Simon Haykin and Van Veen , Wiley, 2nd Edition,2003
T3 Signals & Systems - A.V Oppenheim, A. S. Willsky and S. H. Nawab, PHI, 2nd Edition, 2013.

Reference Books:

R1 Signals & Systems - P. Ramesh Babu, R Ananda Natarajan, 3rd Edition.
R2 Signals & Systems – A. Anand Kumar, PHI Publications, Third Edition, 2013.
R3 Signals Systems – Tarun Kumar & Rawat Oxford publications,2010

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23EC2104	ELECTRONIC DEVICES AND CIRCUITS (R23)	III	Electronics and communication Engineering	5	A, B, C, D, E, F

COURSE OUTCOMES: After completion of this course, the students would be able to

CO1: **Make Use of** P-N diodes in electronic circuits. [K3]..

CO2: **Make Use of** special diodes and rectifiers in electronic circuits. [K3].

CO3: **Examine** the operation of BJT and its applications. [K4].

CO4: **Analyze** the thermal stability of BJT. [K4].

CO5: **Examine** the operation of FET, other transistors and their applications. [K4].

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1: Make Use of** P-N diodes in electronic circuits. **[K3].**	**UNIT I: PN JUNCTION DIODE CHARACTERISTICS:**				
		1.1	Insulators, Semiconductors and Metals–Classification using Energy gap, Intrinsic and Extrinsic Semiconductors.	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		1.2	P-N Junction Diode - Formation of P-N Junction, Open Circuited P-N Junction, Biased P-N Junction - Forward Bias, Reverse Bias	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		1.3	Current Components in PN Junction Diode, Law of Junction, Diode Current Equation - Quantitative Analysis	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		1.4	V-I Characteristics of Diode - Forward Bias, Reverse Bias, Breakdown in P-N Junction Diode,	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		1.5	Temperature Dependence on V-I Characteristics, Diode Resistance- Static Resistance, Dynamic Resistance, Reverse Resistance	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		1.6	Diode Capacitance - Transition Capacitance, Diffusion Capacitance, Energy Band Diagram of PN Junction Diode & Quiz questions discussion	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial & Quiz
		1.7	Problems	T1, T2, R1	1	Chalk & Talk, Tutorial

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			Current amplification factor			PPT & Tutorial
		3.6	Relation among α, β, and γ, Comparison of CB, CE and CC Configurations,	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		3.7	Punch Through/ Reach through, Typical transistor junction voltage values, Photo Transistor and quiz questions discussion	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial & quiz
		3.8	Problems	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
4	CO4: **Analyze** the thermal stability of BJT. [K4].	**UNIT IV:BJT BIASING AND THERMAL STABILITY:**				
		4.1	Need For Biasing, Operating Point, Load Line Analysis - D.C. Load Line, A.C. Load Line	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		4.2	Biasing - Methods, Basic Stability, Fixed Bias	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		4.3	Collector-to-base Bias and Self Bias	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		4.4	Stabilization against variations in VBE, Ic and β, Stability Factors S, S' and S''	T1, T2, R2	2	Chalk & Talk, PPT & Tutorial
		4.5	Bias Compensation - Thermistor, Sensistor	T1, T2, R2	2	Chalk & Talk, PPT & Tutorial
		4.6	Diode Compensation for variation in ICO, Thermal Runaway, Thermal Stability and quiz questions discussion	T1, T2, R2	2	Chalk & Talk, PPT, Tutorial & Quiz
		4.7	Problems	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
5	CO5: **Examine** the operation of FET, other transistors and their applications. [K4].	**UNIT V : FET & OTHER TRANSISTORS:**				
		5.1	FET Types and Symbols - JFET and MOSFET/IGFET	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		5.2	JFET: N- Channel and P-Channel Construction, Operation,	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		5.3	Characteristics - Drain and Transfer, Parameters - Drain Resistance, Amplification factor, Trans conductance, Pinch-off voltage	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		5.4	MOSFET - Types - Depletion	T1, T2, R1	2	Chalk & Talk,

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23EC2105	**Switching Theory & Logic Design** (R23)	III	Electronics and communication Engineering	5	A, B, C, D,E,F

COURSE OUTCOMES: After completion of this course, the students would be able to

CO1: **Classify** and work on different types of number systems and codes that are used in the design of digital systems[K4].

CO2: **Make use of** theorems and postulates of Boolean algebra to minimize various Boolean expressions [K3].

CO3: **Construct** the basic logic circuits and combinational circuits [K3].

CO4: **Apply** different models of Finite State Machines for design of sequential circuits [K3].

CO5: **Utilize** the concept of PLDs to realize switching functions and code converters [K3].

Unit No	Outcome		Topics/Activity	Ref Text book	TotalPeriods	Delivery Method
1	**CO1: Classify** and work on different types of number systems and codes that are used in the design of digital systems[K3].		**UNIT I: REVIEW OF NUMBER SYSTEMS**			
		1.1	Introduction to Number system.	T1, T2, R1	1	Chalk &Talk, PPT
		1.2	Review of number systems – Binary, octal, Hexa decimal numbers.	T1, T2, R1	2	Chalk &Talk, PPT
		1.3	r-1's complement, r's complement of signed numbers& Problem solving.	T1, T2, R1	2	Chalk &Talk, PPT
		1.4	Binary arithmetic-binary weighted and non-weighted codes(Gray codes, Ex-3 Codes).	T1, T2, R1	2	Chalk &Talk, PPT
		1.5	Code Conversions.	T1, T2, R1	2	PPT& NPTEL
		1.6	Error detecting and correcting codes-Hamming codes & Quiz questions discussion.	T1, T2, R1	2	PPT & QUIZ
		1.9	Problems.	T1, T2, R1	1	Chalk &Talk
2	**CO2: Make use of** theorems and postulates of Boolean algebra to minimize various Boolean expressions[K3].		**UNIT II : LOGIC OPERATIONS AND MINIMIZATION TECHNIQUES**			
		2.1	Logic Operations: Basic logical operations, logic gates and universal gates, Pin configurations of 74XX-IC series.	T1, T2, R3	1	Chalk &Talk, PPT
		2.2	Boolean postulates and theorems.	T1, T2, R3	2	Chalk &Talk, PPT
		2.3	Representation of switching functions–standard SOP & POS forms	T1, T2, R3	2	Chalk &Talk, PPT

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		2.4	Minimization Techniques: Minimization of logic functions using Boolean theorems.	T1, T2, R3	2	Chalk &Talk, PPT
		2.5	Minimization of switching functions using K-Map representation up to 6 variables.	T1, T2, R3	3	Chalk &Talk, PPT
		2.6	Tabular (Quine-Mc Cluskey) method with only 4 variables and with single function & Quiz questions discussion.	T1, T2, R3	2	PPT & QUIZ
		2.7	Problems	T1, T2, R3	1	Chalk &Talk
		UNIT III : DESIGN OF COMBINATIONAL CIRCUITS				
3	**CO3: Construct** the basic logic circuits and combinational circuits[K3].	3.1	Introduction of combinational circuits.	T1, T2, R1	1	Chalk &Talk, PPT
		3.2	Design procedure, Design of Adders, Subtractors.	T1, T2, R1	1	Chalk &Talk, PPT
		3.3	Applications of Full adders, 4-bit Binary Subtractor, Adder-Subtractor circuit.	T1, T2, R1	2	Chalk &Talk, PPT
		3.4	BCD adder circuit, Excess-3 adder circuit, Look-a-Head adder circuit.	T1, T2, R1	2	Chalk &Talk, PPT
		3.5	Design of Encoder& Realization of Boolean functions using Encoders.	T1, T2, R1	1	Chalk &Talk, PPT
		MID I EXAMINATION				
		3.6	Design of Decoder& Realization of Boolean functions using Decoders.	T1, T2, R1	2	Chalk &Talk, PPT
		3.7	Multiplexer, higher order Multiplexer& Realization of Boolean functions using multiplexers.	T1, T2, R1	1	Chalk &Talk, PPT
		3.8	Demultiplexer, higher order Demultiplexer& Realization of Boolean functions using Demultiplexers.	T1, T2, R1	2	PPT& NPTEL
		3.9	Design of Code converters.	T1, T2, R1	2	Chalk &Talk, PPT
		3.10	Design of Comparators	T1, T2, R1	1	PPT
		3.12	Problems & Quiz questions discussion.	T1, T2, R1	1	Chalk &Talk,& QUIZ
		UNIT IV: DESIGN OF SEQUENTIAL CIRCUITS				
4	**CO4: Apply** different models of Finite State Machines for design of sequential circuits[K3].	4.1	Introduction sequential circuits.	T1, T2, R3	1	Chalk &Talk, PPT
		4.2	Sequential circuits versus combinational circuits.	T1, T2, R3	1	Chalk &Talk, PPT
		4.3	Classification of sequential circuits, Latches, flip-flops and their excitation requirements.	T1, T2, R3	1	Chalk &Talk, PPT
		4.4	Design of sequential circuits- counters and shift registers.	T1, T2, R3	2	PPT& NPTEL
		4.5	Design of clocked sequential circuit	T1, T2,	2	PPT&

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		4.6	Realization of sequential generator.	T1, T2, R3	1	Chalk &Talk, PPT
		4.4	Applications of counters and shift registers.	T1, T2, R3	1	Chalk &Talk, PPT
		4.5	Finite State Machines-Melay and Moore machines.	T1, T2, R3	2	PPT& NPTEL
		4.6	Capabilities and limitations of finite state machine.	T1, T2, R3	1	Chalk &Talk, PPT
		4.7	Mealy to Moore conversion and vice-versa & Quiz questions discussion.	T1, T2, R3	2	PPT & QUIZ
		4.8	Problems.	T1, T2, R3	1	Chalk &Talk
			UNIT V : SEQUENTIAL CIRCUITS -II			
5	**CO5: Utilize** the concept of PLDs to realize switching functions and code converters[K3].	5.1	Introduction to PLDs.	T1, T2, R1	1	Chalk &Talk, PPT
		5.2	Realization of switching functions using PROM, PLA and PAL.	T1, T2, R1	2	Chalk &Talk, PPT
		5.3	Basics structures PROM, PLA and PAL.	T1, T2, R1	1	Chalk &Talk, PPT
		5.4	Comparison of PROM, PAL and PLA.	T1, T2, R1	2	PPT& NPTEL
		5.5	Implementation of code converters.	T1, T2, R1	2	Chalk &Talk, PPT
		5.6	Introduction to CPLDs and FPGAs& Quiz questions discussion.	T1, T2, R1	1	PPT & QUIZ
		5.7	Problems	T1, T2, R1	1	Chalk &Talk
				Total	65	
			MID II EXAMINATION			
			END EXAMINATIONS			

TEXT BOOKS:

1. M. Morris Mano, "Digital Design", PHI, Fourth Edition, 2008.
2. A. Anand Kumar, "Switching Theory and Logic Design", PHI, Pvt. Ltd, 2nd Ed, 2014.
3. Zvi Kohavi, "Switching and Finite Automata Theory", Cambridge University Press, 3rd Edition, 2009.

REFERENCES :

1. R. P. Jain, "Modern Digital Electronics", Tata McGraw Hill, 4th Edition, 2010.
2. Charles H. Roth Jr, "Fundamentals of Logic Design", CENGAGE Learning, 7th Edition.
3. A. P. Godse, D. A. Godse, "Switching Theory & Logic Design", Technical publications, 2nd Edition, 2013.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Year/Semester	Branch	Contact Periods/Week	Sections
R20EC3202	VLSI Design (R20)	III/II	Electronics and Communication Engineering	6	A, B, C & D

COURSE OUTCOMES: Students are able to
CO1: Demonstrate various fabrication steps of IC and come across basic electrical Properties of MOSFET. **[K2].**
CO2: Illustrate concepts and techniques of modern integrated circuit design and testing (CMOS VLSI). **[K2].**
CO3: Interpret the pass transistor, inverters and scaling rules of MOS technology. **[K2].**
CO4: Analyze the difference between static and dynamic CMOS design. **[K3].**
CO5: Compute inverter delays, fan-in and fan- out, power calculation and clock mechanism in VLSI design.**[K3].**

	Unit	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
				UNIT-I: INTRODUCTION AND BASIC ELECTRICAL PROPERTIES OF MOS CIRCUITS			
	1	**CO 1.** Demonstrate various fabrication steps of IC and come across basic electrical Properties of MOSFET. **[K2].**	1.1	VLSI Design Flow, Introduction to IC Technology, IC production process	T1, R1	2	Chalk & Talk, PPT
				Fabrication process: nMOS, pMOS and CMOS	T1, R1	3	Chalk & Talk, PPT
			1.2	Regions of operation of MOSFET. Ids versus Vds Relationships, Aspects of MOS transistor Threshold Voltage, MOS transistor Trans, Output Conductance and Figure of Merit.	T1, R1	3	Chalk & Talk, PPT, Quiz
			1.3	nMOS Inverter, Pull-up to Pull-down Ratio for nMOS inverter driven by another nMOS inverter, and through one or more pass transistors.	T1, R1	2	Chalk & Talk, PPT
			1.4	Alternative forms of pull-up, The CMOS Inverter	T1, R1	2	Chalk & Talk, PPT
			1.5	Latch-up in CMOS circuits, Bi-CMOS Inverter,	T1, R1	2	Chalk & Talk, PPT
			1.6	Comparison between CMOS and BiCMOS technology.	T1, R1	1	Chalk & Talk, PPT
				UNIT -II: BASIC CIRCUIT CONCEPTS			

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	2	**CO 2.** Illustrate concepts and techniques of modern integrated circuit design and testing (CMOS VLSI). **[K2].**	2.1	Sheet Resistance, Sheet Resistance concept applied to MOS transistors and Inverter	T1, R1	2	Chalk & Talk, PPT
			2.2	Area Capacitance calculations, Standard unit of capacitance	T1, R1	2	Chalk & Talk, PPT
			2.3	The Delay Unit, Inverter Delays, Propagation Delays	T1, R1	2	Chalk & Talk, PPT
			2.4	Driving large Capacitive Loads, Wiring Capacitances	T1, R1	2	Chalk & Talk, PPT
			2.5	Choice of layers.	T1, R1	2	Chalk & Talk, PPT
			2.6	Switch logic, Gate logic.	T1, T3, R1	2	Chalk & Talk, PPT, Quiz
			UNIT-III: VLSI CIRCUIT DESIGN PROCESS				
	3	**CO 3.** Interpret the pass transistor, inverters and scaling rules of MOS technology. **[K2].**	3.1	MOS layers	T1, R1	1	Chalk & Talk, PPT
			3.2	Stick diagrams	T1, R1	2	Chalk & Talk, PPT, Tutorial
			3.3	Design rules and layout	T1, R1	2	Chalk & Talk, PPT, Tutorial
			3.4	Layout Diagrams for MOS circuits.	T1, R1	2	Chalk & Talk, PPT, Tutorial
			3.5	**SCALING OF MOS CIRCUITS:** Scaling models and scaling factors, Scaling factors for device parameters	T1, R1	2	Chalk & Talk, PPT
			3.6	Limitations of scaling, Limits due to sub threshold currents, Limits on logic levels and supply voltage due to noise and current density.		2	Chalk & Talk,
			3.7	BASIC BUILDING BLOCKS OF ANALOG IC DESIGN: Modelling of transistor,	T2, R1, R2		

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							Talk, PPT
			3.8	Body bias effect, biasing styles,	T2, R1, R2	1	Chalk & Talk, PPT
			3.9	Single stage amplifier with resistive load, single stage amplifier with diode connected load	T2, R1, R2	2	Chalk & Talk, PPT
	MID I EXAMINATION DURING 9th WEEK						
			UNIT -IV: CMOS COMBINATIONAL AND SEQUENTIALLOGIC CIRCUIT DESIGN:				
			4.1	**STATIC CMOS DESIGN:** Introduction to Complementary CMOS, Rationed Logic,	T2, R1, R2	1	Chalk & Talk, PPT
		CO 4. Analyze the difference between static and dynamic CMOS design. **[K3].**	4.2	Pass Transistor Logic.	T2, R1, R2	1	Chalk & Talk, PPT
			4.3	**DYNAMIC CMOS DESIGN:** Dynamic Logic-Basic Principles	T2, R1, R2	1	Chalk & Talk, PPT
	4		4.4	Speed and Power Dissipation of Dynamic Logic, Issues in Dynamic Design	T2, R1, R2	2	Chalk & Talk, PPT
			4.5	Cascading Dynamic Gates.	T2, R1, R2	1	Chalk & Talk, PPT
			4.6	Latch versus Register, Latch based design	T2, R1, R2	1	Chalk & Talk, PPT
			4.7	Timing decimation, positive feedback, instability, Meta-stability	T2, R1, R2	2	Chalk & Talk, PPT
			4.8	Multiplexer based latches	T2, R1, R2	1	Chalk & Talk, PPT
			UNIT-V: FPGA DESIGN				
		CO 5: Compute inverter delays, fan-in and fan- out, power calculation and clock mechanism in VLSI design. [K3]	5.1	FPGA design flow, Basic FPGA architecture	T2, T3, R3	2	Chalk & Talk, PPT
	5		5.2	FPGA Technologies.	T2, T3, R3	2	Chalk & Talk, PPT
			5.3	**INTRODUCTION TO ADVANCED TECHNOLOGIES:** Giga-scale dilemma	T2, T3, R3	1	Chalk & Talk, PPT

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			5.4	Short channel effects, High–k	T2, T3, R3	2	Chalk & Talk, PPT
			5.5	Metal Gate Technology	T2, T3, R3	1	Chalk & Talk, PPT
			5.6	FinFET	T2, T3, R3	1	Chalk & Talk, PPT
			5.7	TFET	T2, T3, R3	1	Chalk & Talk, PPT
					Total	60	
	MID II EXAMINATION DURING 18th WEEK						
	END EXAMINATIONS						

Text Books:

T	BOOK TITLE/AUTHORS/PUBLISHER
T1.	"Essentials of VLSI Circuits and Systems"/ Kamran Eshraghian, Douglas and A. Pucknell and Sholeh Eshraghian,/Prentice-Hall of India Private Limited, 2009 Edition.
T2.	"Design of Analog CMOS Integrated Circuits"/Behzad Razavi/McGraw Hill, 2003
T3.	"Digital Integrated Circuits"/Jan M. Rabaey, Anantha Chandrakasan and Borivoje Nikolic/2nd Edition,2016

Reference Books:

R	BOOK TITLE/AUTHORS/PUBLISHER
R1.	"Introduction to VLSI Circuits and Systems"/John P. Uyemura/ John Wiley & Sons, reprint 2009.
R2.	"Integrated Nanoelectronics: Nanoscale CMOS, Post-CMOS and Allied Nanotechnologies"/Vinod Kumar Khanna/Springer India, 1st Edition, 2016.
R3.	"FinFETs and other multi-gate transistors"/ColingeJP/Editor New York, Springer,2008

Web Source References:

S. No	Name	URL
1.	CMOS Fabrication process	https://www.youtube.com/watch?v=sV2xT-WCSSI
2.	MOS and BiCMOS circuit design process	https://drive.google.com/file/d/1JK888NP4JRqq-_xxIxuusX6msuwnqj0s/view?usp=sharing
3.	VLSI Circuit design	https://docs.google.com/presentation/d/1gB2b2wV86f4QGg4M4X1CDfstlBsw9AMY/edit?usp=sharing&ouid=102828445989699361381&rtpof=true&sd=true

1. (DVR (DRIC-Bujji)
2. T. P. SRINIVASARAO

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Department of Electronics and Communication Engineering

LESSON PLAN

Course Code	Course Title (Regulation)	Year - Semester	Branch	Contact Periods/ Week	Sections
R20EC3203	MICROPROCESSORS & MICROCONTROLLERS (R 20)	III - II	ECE	5	A, B, C & D

COURSE OUTCOMES:

CO1: Make use of Instruction set in developing the assembly language programming. **(K3)**
CO2: Demonstrate the hardware features of 8086 and Pentium processors. **(K2)**
CO3: Model an 8086 based microcomputer system by interfacing memory and I/O devices. **(K3)**
CO4: Explain 8051 architecture and the function of on-chip hardware units in 8051. **(K2)**
CO5: Develop 8051 embedded C programs for interfacing Matrix Keyboard, LCD, DAC, ADC and 7segment LED Display. **(K3)**

Unit No.	Outcome		Topics/Activity	Ref Text Book	Total Periods	Delivery Method(s)
1	**CO1:**Make use of Instruction set in developing the assembly language programming. **(K3)**		**UNIT–I: 8086 MICROPROCESSOR ARCHITECTURE & PROGRAMMING**			
		1.1	Introduction to 8085	T1, R1	1	Chalk & Talk
		1.2	Architecture of 8086	T1, R1	1	Chalk & Talk
		1.3	Register organization of 8086	T1, R1	1	Chalk & Talk
		1.4	physical memory organization	T1, R1	1	Chalk & Talk
		1.5	I/O addressing capability	T1, R1	1	Chalk & Talk
		1.6	addressing modes of 8086	T1, R1	1	Chalk & Talk
		1.7	instruction set of 8086,	T1, R1	2	Chalk & Talk
		1.8	Assembler directives and operators.	T1, R1	1	Chalk & Talk
		1.9	AssemblyLanguage Programming of 8086	T1, R1	2	Chalk & Talk
		1.10	introduction to stack	T1, R1	1	Chalk & Talk
		1.11	stack structure of 8086/8088	T1, R1	1	Chalk & Talk
		1.12	Progrmming	T1, R1	1	Chalk & Talk
		1.13	Progrmming	T1, R1	1	Chalk & Talk
2	**CO2:** Demonstrate the hardware		**UNIT–II: 8086 INTERRUPTS**			
		2.1	Signal description of 8086	T1, R1	1	Chalk & Talk
		2.2	interrupts and interrupt service routines	T1, R1	1	Chalk & Talk

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	features of 8086 and Pentium processors. **(K2)**	2.3	interrupt cycle of 8086	T1, R1	1	Chalk & Talk
		2.4	non-mask able interrupt and mask able interrupts	T1, R1	1	Chalk & Talk
		2.5	interrupt programming	T1, R1	1	Chalk & Talk
		2.6	minimum mode of 8086 system	T1, R1	1	Chalk & Talk
		2.7	maximum mode of 8086 system	T1, R1	1	Chalk & Talk
		2.8	timings diagrams for different bus operations	T1, R1	1	Chalk & Talk
		2.9	Introduction to Pentium processor architecture.	T1, R1	1	Chalk & Talk
		2.10	Progrmming	T1, R1	1	Chalk & Talk
		2.11	Progrmming	T1, R1	1	Chalk & Talk
3	**CO3:** Model an 8086 based microcomp uter system by interfacing memory and I/O devices. **(K3)**	**UNIT–III: 8086 INTERFACING**				
		3.1	Semiconductor memory interfacing	T1, R1	2	Chalk & Talk
		3.2	Interfacing I/O ports	T1, R1	1	Chalk & Talk
		3.3	PIO 8255	T1, R1	1	Chalk & Talk
		3.4	modes of operation of 8255	T1, R1	1	Chalk & Talk
		3.5	interfacing of D/A converters	T1, R1	1	Chalk & Talk
			MID-I EXAMINATION			
		3.6	interfacing of A/D converters	T1, R1	2	Chalk & Talk
		3.7	interfacing of stepper motor	T1, R1	1	Chalk & Talk
		3.8	Programmable interrupt controller 8259A	T1, R1	1	Chalk & Talk
		3.9	programmable communication interface 8251 USART	T1, R1	1	Chalk & Talk
		3.10	8257 DMA	T1, R1	1	Chalk & Talk
4	**CO4:** Explain 8051 architecture and the function of on-chip hardware units in 8051. **(K2)**	**UNIT-IV: INTRODUCTION TO 8051 MICROCONTROLLER**				
		4.1	Overview of 8051 microcontroller	T2, T3, R2	1	PPT,quiz
		4.2	Architecture of 8051 microcontroller	T2, T3, R2	1	PPT
		4.3	I/O Ports	T2, T3, R2	1	PPT
		4.4	Memory organization	T2, T3, R2	1	Chalk & Talk
		4.5	addressing modes	T2, T3, R2	1	Chalk & Talk
		4.6	instruction set of 8051	T2, T3, R2	2	Web Resources
		4.7	instruction set of 8051	T2, T3, R2	1	Chalk & Talk
		4.8	Interrupts	T2, T3, R2	1	Chalk & Talk
		4.9	timer/ Counter and serial communication	T2, T3, R2	1	Chalk & Talk
		4.10	timer/ Counter and serial communication	T2, T3, R2	1	PPT
5	**CO5:** Develop 8051 embedded	**UNIT–V: INTERFACING AND APPLICATIONS OF 8051**				
		5.1	Interfacing 8051 to LED's	T2, T3, R2	1	Chalk & Talk
		5.2	Interfacing 8051 to LCD's	T2, T3, R2	1	Chalk & Talk

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	C programs for interfacing Matrix Keyb oard, LCD, DAC, ADC and 7segment LED Display. **(K3)**	5.3	Keyboard Interfacing	T2, T3, R2	1	Chalk & Talk
		5.4	Interfacing Seven segment display	T2, T3, R2	2	Chalk & Talk
		5.5	ADC Interfacing.	T2, T3, R2	2	PPT
		5.6	DAC Interfacing.	T2, T3, R2	2	Chalk & Talk
		5.7	REVISION	T1,T2, T3, R1,R2	1	Web Resources
		5.8	REVISION	T1,T2, T3, R1,R2	1	Chalk & Talk
Total Classes					**60**	
MID-II EXAMINATION						
END SEMESTER EXAMINATION						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	A.K.Ray, K.M.Bhurchandi, "Advanced Microprocessors and Peripherals", Tata McGraw Hill Publications, 2000.
T2	Ayala, K.J., "The 8051 Microcontroller Architecture, Programming and Applications", 3rd Edition, Penram International, 2007.
T3	Ajay V Deshmukh, "Microcontrollers", McGraw-Hill Education, 2017.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Douglas V Hall, "Microprocessors and interfacing, Programming and Hardware", 2nd Edition, TMH, 2006
R2	N.Sentil Kumar,M.Saravanan, S.Jeevananthan, "Microprocessors and Microcontrollers", Oxford University Press, 2010.

WEB SOURCE REFERENCES:

1	http:// http://nptel.ac.in/courses/106108100/
2	https://onlinecourses.nptel.ac.in/noc18_ec03/
3	https://www.electronicshub.org/8051-microcontroller-introduction/
4	https://www.edgefx.in/8051-microcontroller-architecture/

1. Dr.Y.Jagpal Reddy
2.

Faculty Member **Head of the Department** **Principal**

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Narasaraopeta Engineering College

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Yallmanda(Post), Narasaraopet- 522601
Department of Electronics & Communication Engineering

LESSON PLAN

COURSE CODE	COURSE NAME	YEAR	BRANCH	CONTACT HOURS	SECTIONS
R20EC3207	Digital Image Processing	III/II	Electronics & Communication Engineering	6	A,B,C&D

COURSE OUTCOMES:

SNO	Course Outcome Statement
CO1	**Develop** any image processing application and List different techniques employed for the enhancement of images. **[K3]**.
CO2	**Compare** different causes for image degradation and overview of image restoration Techniques **[K3]**.
CO3	**Relate** the need for image compression and to learn the spatial and frequency domain techniques of image compression. **[K4]**.
CO4	**Interpret** Image compression standards and representation techniques. **[K2]**.
CO5	**Construct** different feature extraction techniques for image analysis and recognition. **[K3]**.

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1. **Develop** any image processing application and List different techniques employed for the enhancement of images **[K3]**.	**Unit-1. INTRODUCTION AND IMAGE TRANSFORMS**				
		1.1	Digital Image Fundamentals	T1, R2	1	PPT, PPT, Chalk&Talk
		1.2	Elements of Visual perception.	T1, R2	1	PPT, Chalk&Talk
		1.3	Image sensing and Acquisition	T1, R2	2	PPT, Chalk&Talk
		1.4	Imaging in different bands. Digital Image Representation. Relationship between pixels	T1, R2	2	PPT, Chalk&Talk
		1.5	IMAGE TRANSFORMS: Image Transforms: 2-D FFT, Properties	T2, R2	1	PPT, Chalk&Talk
		1.6	Walsh Transform, Hadamard Transform	T1, R2	1	PPT, Chalk&Talk
		1.7	Discrete Cosine Transform, Discrete sine Transform	T1,R2	1	PPT, Chalk&Talk
		1.8	Hadamard,walsh Transforms, Hotelling Transform	T1,R2	1	PPT, Chalk&Talk

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		1.9	2D-Wavelet transformation, Wavelet packets	T1,R2	2	PPT, Chalk&Talk
2	CO2. **Compare** different causes for image degradation and overview of image restoration Techniques **[K3]**.	**Unit-2. TRANSFORMATIONS AND FILTERING**				
		2.1	Some basic intensity transformation functions	T1, R2	2	PPT, Chalk&Talk
		2.2	Histogram processing	T1, R2	1	PPT, Chalk&Talk
		2.3	Image Enhancements in spatial domain and Frequency domain	T1, R2	1	PPT, Chalk&Talk
		2.4	Linear and Non - Linear Gray Level Transformation, point operations	T1, R2	1	PPT, Chalk&Talk
		2.5	Linear and Non - Linear Gray Level Transformation	T1, R2	1	PPT, Chalk&Talk
		2.6	Local or Neighborhood Operation	T1, R2	1	PPT, Chalk&Talk
		2.7	Image Restoration techniques	T1, R2	2	PPT, Chalk&Talk
		2.8	Noise restoration filters	T1, R2	1	PPT, Chalk&Talk
		2.9	Adaptive filters, Linear, Position invariant degradation	T1, R2	1	PPT, Chalk&Talk
		2.10	Estimation of Degradation functions	T1, R2	1	PPT, Chalk&Talk
3	CO 3. Relate the need for image compression and to learn the spatial and frequency domain techniques of image compression **[K4]**.	**Unit-3. COLOR IMAGE PROCESSING**				
		3.1	Color fundamentals	T1, R2	1	PPT, Chalk&Talk
		3.2	Color models,	T1, R2	2	PPT, Chalk&Talk
		3.3	Pseudo or False color image processing	T1, R2	1	PPT, Chalk&Talk
		3.4	True or Full color image processing	T1, R2	1	PPT, Chalk&Talk
		3.5	Color transformations	T1, R2	1	PPT, Chalk&Talk
		MID I EXAMINATIONS				
		3.6	Smoothing and sharpening	T1, R2	2	PPT, Chalk&Talk
		3.7	Image segmentation based on color	T1, R2	1	PPT, Chalk&Talk
		3.8	Noise in color images	T1, R2	1	PPT, Chalk&Talk

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		3.9	Color image compression	T1, R2	2	PPT, Chalk&Talk
		Unit-4. WAVELETS AND MULTI-RESOLUTION PROCESSING				
4	CO4. Interpret Image compression standards and representation techniques[K2].	4.1	Image pyramids,	T1, R2	1	PPT
		4.2	Sub band coding	T1, R2	1	PPT
		4.3	Haar transforms	T1, R2	1	PPT
		4.4	Multi resolution expressions	T1, R2	1	PPT
		4.5	Wavelet transforms in one and Two dimensions	T1, R2	2	PPT
		4.6	Fast wavelet transform dimensions	T1, R2	1	PPT
		4.7	Wavelet packet.	T1, R2	1	PPT
		4.8	Image Compression: Fundamentals,	T1, R2	1	PPT
			Various compression methods-coding techniques	T1, R2	2	PPT
			digital image water marking	T1, R2	1	PPT
		Unit 5. MORPHOLOGICAL IMAGE PROCESSING				
5	CO5. **Construct** different feature extraction techniques for image analysis and recognition[K3].	5.1	Preliminaries Erosion and dilation	T1, R2	1	PPT
		5.2	opening and closing Operations	T1, R2	1	PPT
		5.3	The Hit or Miss Transformation	T1, R2	1	PPT
		5.4	Some Basic Morphological algorithms	T1, R2	2	PPT
		5.5	Grey –scale morphology	T1, R2	1	PPT
		5.5	Image Segmentation: Fundamentals	T1, R2	1	PPT
		5.6	point, line, edge detection	T1, R2	1	PPT
		5.7	Threshold and Region –based segmentation	T1, R2	2	PPT
		5.8	segmentation using Morphological watersheds	T1, R2	1	PPT
		5.9	The use of motion in segmentation	T1, R2	1	PPT
				Total	60	
MID II EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS	
T1	Rafael C. Gonzalez, Richard E. Woods, — Digital Image Processingl, 3rd Edition, Pearson, 2008
T2	A.K.Jain," Fundamentals of Digital Image Processing", PHI,1995
T3	S Jayaraman, S Esakkirajan and T Veerakumar, —Digital Image Processing, TMH, 2010.
REFERENCE BOOKS	
R1	J.C. Russ," The Image Processing Handbook", (5/e), CRC, 2006
R2	Rafael C. Gonzalez, Richard E Woods and Steven L. Eddings, —Digital Image Processing using MATLAB, 2nd Edition, TMH, 2010.
WEB SOURCE REFERENCES:	
1	https://onlinecourses.nptel.ac.in/noc18_ee40/preview Digital Image Processing Dr. Prabir Kr. Biswas IIT Kharagpur,
2	https://www.youtube.com/watch?v=DSGHkvQBMbs&list=PLuv3GM6-gsE08DuaC6pFUvFaDZ7EnWGX8
3	https://www.tutorialspoint.com/dip/index.html
4	https://nptel.ac.in/courses/117105135/

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DEPARTMENTOF ELECTRONICS &COMMUNICATION ENGINEERING

LESSON PLAN

Course Code	CourseTitle(Regulation)	Year - Semester	Branch	ContactPeriods/Week	Sections
R20CC20E10	Oops Through Java (R20)	III-II	ECE	5	A,B,C,D

COURSE OUTCOMES : After completion of this course, the students would be able to

CO1: Summarize the basic concepts of Object Oriented Programming.
CO2: Illustrate various programming paradigms of Object Oriented Programming.
CO3: Analyze inheritance, packages and Exception handling concepts.
CO4: Apply multi-threading concepts and Applets.
CO5: Apply Event Handling and AWT concepts in various UI Applications.

Unit	Outcome		Topics/Activity	Ref Text book	TotalPeriods	Delivery Method
		Unit-1: Introduction to OOP				
	CO1: Summarize the basic concepts of Object Oriented Programming.	1.1	Introduction, Need of Object Oriented Programming	T1,R1,R2	2	Chalk &Talk
		1.2	Principles of Object-Oriented Languages(Classes, Objects, Abstraction, Encapsulation, Inheritance, Polymorphism).	T1,R1,R2	1	Chalk &Talk
		1.3	Procedural languages Vs. OOP, Applications of OOP.	T1,R1,R2	1	Chalk &Talk
		1.4	History of JAVA, Java Features(Platform Independence, Object-Oriented, Both Java compiled and interpreted, Robust, Security, Multithreaded, other features)	T1,R1,R2	2	Chalk &Talk
		1.5	Java Virtual Machine, and Program structures	T1,R1,R2	1	Chalk &Talk
		1.6	Installation of JDK1.8(Getting started with JDK, JDK Installation notes, Exploring the JDK)	T1,R1,R2	1	Chalk &Talk
	CO2 : Illustrate various programming paradigms of Object Oriented Programming.	**Unit-2: Programming Constructs, Classes and Objects**				
		2.1	Variables, Primitive Data types, Identifiers (Naming Conventions, Keywords).	T1,R1,R2	1	Chalk & Talk
		2.2	Literals ,Operators (Binary, Unary and ternary)	T1,R1,R2	2	Chalk & Talk
		2.3	Expressions, Precedence rules and Associativity, Primitive Type Conversion and Casting,	T1,R1,R2	2	Chalk & Talk
		2.4	Flow of control (Branching, Conditional, loops).	T1,R1,R2	1	Chalk & Talk
		2.5	Classes, Objects, Creating Objects, Methods (method types, method overloading).	T1,R1,R2	2	Chalk & Talk , Semi
		2.6	Constructors, Garbage collector, Static keyword (static variables, methods, blocks).	T1,R1,R2	2	Chalk & Talk
		2.7	this keyword, Arrays, Recursion, Command line arguments and String handling	T1,R1,R2	2	Chalk & Talk

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	3	CO3: Analyze inheritance, packages and Exception handling concepts.	**Unit-3 : Inheritance ,Interfaces, Packages and Enumeration**				
			3.1	Types of Inheritance, Deriving classes using extends keyword,	T1,R1,R3	2	Chalk &Talk
			3.2	Method overriding, super keyword, final keyword, Abstract class.	T1,R1,R3	2	Chalk & Talk
			3.3	Interface (Variables in interface, Extending interface), Interface vs. Abstract classes.	T1,R1, R3	2	Collaborative Learning
				MID – I EXAMINATIONS			
			3.4	Packages (Creating packages, using Packages, Access protection).	T1,R1,R2	2	Chalk Talk
			3.5	Understanding CLASSPATH, java.lang package (Object class)	T1,R1,R2	1	Chalk Talk
			3.6	String class , enumeration.	T1,R1,R2	1	Flipped Learning
			3.7	Introduction, Exception handling techniques (try...catch)	T1,R1,R2	2	Chalk Talk
			3.8	throw, throws, finally block, user defined exception..	T1,R1,R2	2	Chalk Talk
			Unit-4: Multi Threading and Applets				
	4	CO4: Apply multi-threading concepts and Applets.					
			4.1	java.lang.Thread, Thread life cycle, The main Thread,	T1,R1,R2	2	Chalk Talk
			4.2	Creation of new threads (by inheriting Thread class, Implementing the Runnable interface), Thread priority.	T1,R1,R2	2	Chalk Talk
			4.3	Multithreading using isAlive() and join(), Synchronization(Synchronizing Methods, Statements.	T1,R1,R2	1	Seminar
			4.4	Suspending and Resuming threads, Communication between Threads.	T1,R1,R2	2	Chalk Talk
			4.5	Applet class, Applet structure.	T1,R1,R2	1	Chalk Talk
			4.6	An Example Applet Program, Applet Life Cycle (init(), start(), stop(), destroy()), paint(),update() and repaint(),	T1,R1,R2	2	Chalk Talk
			4.7	passing parameters to the Applet.	T1,R1,R2	1	Chalk Talk
			UNIT-5 : Event Handling, Abstract Window Toolkit				
	5	CO5 : Apply Event Handling and AWT concepts in various UI Applications.					
			5.1	Introduction, Event Delegation Model	T1,R1,R2	2	Chalk Talk
			5.2	java.awt.event Description	T1,R1,R2	2	Chalk Talk
			5.3	Sources of Events, Event Listeners,	T1,R1,R2	2	Chalk Talk
			5.4	Adapter classes, Inner classes.	T1,R1,R2	3	Virtual Labs
			5.5	Why AWT?, java.awt package, Components and Containers.	T1,R1,R2	2	Chalk Talk

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			5.6	Button, Label, Checkbox, Radio buttons, List boxes, Choice boxes, Text field and Text area,	T1,R1,R2	2	Chalk Talk
			5.7	container classes, Layouts,	T1,R1,R2	1	Chalk & Talk
			5.8	Menu, Scroll bar	T1,R1,R2	1	Chalk& Talk,PPT
		Total					60
	MID – II EXAMINATIONS						
	END EXAMINATIONS						

TEXT BOOKS:
T1. Herbert Schildt, "The Complete Reference Java", 8/e, , TMH, 2011. (UNITS :I, IV, V)
T2.Sachin Malhotra, SaurabhChoudhary, "Programming in JAVA", 2/e, , Oxford,2014. (UNITS: I, II &III)
REFERENCE BOOKS:
R1 . JAVA Programming, K. Rajkumar,1/e, Pearson,2013.
R2 . Core JAVA, Black Book, Nageswara Rao, Wiley, 1/e, Dream Tech,2012.

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Department of Electronics and Communication Engineering

LESSON PLAN

Course Code	Course Title (Regulation)	Year - Semester	Branch	Contact Periods/ Week	Sections
R20EC4102	CELLULAR AND MOBILE COMMUNICATIONS (R20)	IV - I	ECE,	6	A, B, C & D

COURSE OUTCOMES:

CO1: Illustrate fundamental concept of Cellular Radio System Operation and Design. [K2]
CO2: Analyze Measurement of C/I value in Omni directional & Directional Antenna System, Co-channel, Non Co-channel interference, and Adjacent Channel Interference. [K4]
CO3: Interpret cell coverage for signal and traffic, diversity techniques and mobile antennas and demonstrate Frequency management and Channel assignment. [K2]
CO4: Classify different types of handoffs. [K2]
CO5: Summarize GSM architecture and channels, TDMA architecture and channels, and CDMA architecture and channels. [K2]

Unit No.	Outco.		Topics/Activity	Ref Text Book	Total Periods	Delivery Method(s)
I	CO1: Illustrate fundame concept of Cellular Radio System Operation and Design. [K2]		**UNIT I: INTRODUCTION TO CELLULAR MOBILE RADIO SYSTEMS**			
		1.1	Limitations of Conventional Mobile Telephone Systems, Basic Cellular Mobile System	T1, R2	1	Chalk & Talk, PPT, Quiz, Web Resources
		1.2	Uniqueness of mobile radio environment	T1, T3, R2	2	Chalk & Talk, PPT, Quiz
		1.3	Fading - Time Dispersion Parameters, Coherence Bandwidth, Doppler Spread and Coherence Time	T1, T3,R2	2	Chalk & Talk, PPT, Quiz
		1.4	Fundamentals of Cellular Radio System Design: Concept of Frequency Reuse, Co-Channel Interference, Co-Channel Interference Reduction Factor	T1, T3,R1	2	Chalk & Talk, PPT, Quiz, Web Resources
		1.5	Desired C/I from a normal case in a Omni directional Antenna system	T1, T3,R2	2	Chalk & Talk, PPT, Quiz
		1.6	System Capacity, Trunking and Grade of Service	T1, T3,R2	2	Chalk & Talk, PPT, Quiz
		1.7	Improving Coverage and Capacity in Cellular Systems- Cell Splitting, Sectoring	T1, T3,R1, R2, R4	1	Chalk & Talk, PPT, Quiz
		1.8	Tutorial	T1, T3, R2, R4	1	Chalk & Talk, PPT, Quiz, Web Resources

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II	CO2: Analyze Measurement of C/I value in Omni directional & Directional Antenna System, Co-channel, Non Co-channel interference, and Adjacent Channel Interference. [K4]	**UNIT II: CO-CHANNEL INTERFERENCE AND CELL COVERAGE**				
		2.1	Measurement of Real Time Co-Channel Interference	T1, T3, R2	1	Chalk & Talk, PPT, Quiz
		2.2	Design of Antenna System, Antenna Parameters and Their Effects	T1, T2, R2	1	Chalk & Talk, PPT, Quiz, Web Resources
		2.3	Diversity Techniques-Space Diversity, Polarization Diversity, Time Diversity	T1, T2, R2	2	Chalk & Talk, PPT, Quiz, Web Resources
		2.4	Non-Co-Channel Interference, Cross Talk, Effects on Coverage and Interference by Power Decrease, Antenna Height Decrease	T1, T2, R2	3	Chalk & Talk, PPT, Quiz, Web Resources
		2.5	**Cell Coverage for Signal and Traffic:** Signal reflections in flat and hilly terrain, effect of human made structures, Phase difference between direct and reflected paths	T1, T2, R2	3	Chalk & Talk, PPT, Quiz, Web Resources
		2.6	Constant standard deviation, straight line path loss slope,	T1, T2, R2	2	Chalk & Talk, PPT, Quiz
		2.7	Tutorial	T1, T2, R2	1	Chalk & Talk, PPT, Quiz
III	**CO3:** Interpret cell coverage for signal and traffic, diversity techniques and mobile antennas and demonstrate Frequency management and Channel assignment. [K2]	**UNIT–III: ANTENNAS AND CHANNEL ASSIGNMENT**				
		3.1	Cell Site and Mobile Antennas: Space Diversity Antennas, Umbrella Pattern Antennas	T1, R1, R3	2	Chalk & Talk, PPT, Quiz
		3.2	Minimum Separation of Cell Site Antennas, Mobile Antennas	T1, R1, R3	2	Chalk & Talk, PPT, Quiz
		3.3	Tutorial	T1, R1, R3	1	Chalk & Talk, PPT, Quiz
		MID-I EXAMINATION DURING NINTH WEEK				
		3.4	**Frequency Management and Channel Assignment:** Numbering and grouping the channels	T1, T3, R1, R2	3	Chalk & Talk, PPT, Quiz
		3.5	Setup access and paging channels channel assignments to cell sites and mobile units	T1, R1, R2	2	Chalk & Talk, PPT, Quiz
		3.6	Channel sharing and borrowing, Sectorization, overlaid cells	T1, R1, R2	2	Chalk & Talk, PPT, Quiz
		3.7	Non fixed channel assignment	T1, R1, R2	2	Chalk & Talk, PPT, Quiz
		3.8	Tutorial	T1, R1, R2	1	Chalk & Talk, PPT, Quiz, Web Resources
IV	CO4: Classify different types of handoffs. [K2]	**UNIT–IV: HANDOFFS AND DROPPED CALLS**				
		4.1	Handoff, dropped calls, Types of handoff, handoff initiation, Power difference handoff, Forced handoff	T1, R2	2	Chalk & Talk, PPT, Quiz, Web Resources
		4.2	Delaying handoff, forced handoff, Power difference handoff, Forced handoff	T1, R2	2	Chalk & Talk, PPT, Quiz

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		4.3	Mobile assigned handoff, Intersystem handoff	T1, T2, R2	2	Chalk & Talk, PPT, Quiz
		4.4	Introduction to Dropped Call Rates and their Evaluation	T1, R2	3	Chalk & Talk, PPT, Quiz
		4.5	Tutorial	T1, T2, R2	2	Chalk & Talk, PPT, Quiz, Web Resources
V	**CO5:** Summarize GSM architecture-channels, TDMA architecture-channels and CDMA architecture channels. **[K2]**	**UNIT–V: DIGITAL CELLULAR MOBILE SYSTEM**				
		5.1	GSM architecture, GSM channels	T3, R2	2	Chalk & Talk, PPT, Quiz, Web Resources
		5.2	TDMA architecture, TDMA channels	T3, R2	2	Chalk & Talk, PPT, Quiz, Web Resources
		5.3	CDMA architecture, CDMA channels	T3, R2	3	Chalk & Talk, PPT, Quiz, Web Resources
		5.4	Tutorial	T3, R2	1	Chalk & Talk, PPT, Quiz, Web Resources
				Total Classes	**60**	
		MID-II EXAMINATION DURING EIGTHEENTH WEEK				
		END SEMESTER EXAMINATION				

TEXT BOOKS	
T	**AUTHORS/BOOK TITLE/ PUBLISHER**
T1	William C.Y. Lee, Mobile Cellular Telecommunications: Analog and Digital Systems, Mc Graw Hill, 2nd Edition, 2006.
T2	Theodore. S. Rapport, Wireless Communications, Pearson Education, 2010.
T3	Gottapu Sashibhushana Rao, Mobile Cellular Communication Pearson, 2012.
REFERENCE BOOKS	
R	**AUTHOR/BOOK TITLE/ PUBLISHER**
R1	Gordon L. Stuber, Principles of Mobile Communicationsl, Springer International, 2nd Edn., 2001.
R2	Simon Haykin, Michael Moher, Modern Wireless Communications, Pearson Education, 2005

WEB SOURCE REFERENCES:

S.No.	URL
1	https://in.coursera.org/lecture/wireless-communications/1-1-cellular-communication-KpitQ
2	https://in.coursera.org/lecture/wireless-communications/6-3-mobile-network-qxAtk
3	https://onlinecourses.nptel.ac.in/noc23_ee70/preview
4	https://nptel.ac.in/courses/106106167

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20EC4106	RADAR SYSTEMS (R20)	IV-I	Electronics and Communication Engineering	6	A, B,C & D

COURSE OUTCOMES: After completion of this course, the students are able to

CO1: Demonstrate the basic principles of RADAR System. **[K2]**

CO2: Solve the RADAR Equation and to calculate Transmitter power. **[K3]**

CO3: Know working principles of different types of RADARs. **[K3]**

CO4: Demonstrate the knowledge of solving issues related to different RADAR problems. **[K2]**

CO5: Contrast the different methods used for tracking targets. **[K4]**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT–I: INTRODUCTION			
1	CO 1. **Demonstrate** the basic principles of RADAR System. **[K2]** & CO2 **Solve** the RADAR Equation and to calculate Transmitter power. **[K3]**	1.1	Nature of Radar: Basic Radar	T1, R1	1	Chalk & Talk, PPT
		1.2	Maximum Unambiguous Range	T1, R1	1	Chalk & Talk, PPT
		1.3	Radar Waveforms	T1, R1	1	Chalk & Talk, PPT
		1.4	Simple form of Radar Equation	T1, R1	1	Chalk & Talk, PPT
		1.5	Radar Block Diagram and Operation	T1, R1	1	Chalk & Talk, PPT
		1.6	Radar Frequencies and Applications	T1, R1	1	Chalk & Talk, PPT
		1.7	Related Problems	T1, R1	1	Chalk & Talk, PPT
		1.8	Radar Equation: Prediction of Range Performance	T1, R1	1	Chalk & Talk, PPT
		1.9	Minimum Detectable Signal	T1, R1	1	Chalk & Talk, PPT
		1.10	Integration of Radar Pulses	T1, R1	1	Chalk & Talk, PPT
		1.11	Radar Cross Section of Targets (simple targets-sphere, cone-sphere)	T1, R1	1	Chalk & Talk, PPT
		1.12	Transmitter power	T1, R1	1	Chalk & Talk, PPT
		1.13	PRF and Range Ambiguities	T1, R1	1	Chalk & Talk, PPT
		1.14	System Losses (Qualitative treatment), Related Problems.	T1, R1	1	Chalk & Talk, PPT

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2	CO 3. **Know** working principles of different types of RADARs. **[K3]**	**UNIT–II: CW AND FM-CW RADAR**				
		2.1	CW Radar: Doppler Effect	T1, R1	1	Chalk & Talk, PPT
		2.2	CW Radar – Block Diagram	T1, R1	1	Chalk & Talk, PPT
		2.3	Isolation between Transmitter and Receiver	T1, R1	1	Chalk & Talk, PPT
		2.4	Non-zero IF Receiver	T1, R1	1	Chalk & Talk, PPT
		2.5	Bandwidth Requirement, Sign of the radial velocity	T1, R1	1	Chalk & Talk, PPT
		2.6	Doppler frequency shift	T1, R1	1	Chalk & Talk, PPT
		2.7	Applications of CW radar	T1, R1	1	Chalk & Talk, PPT
		2.8	Frequency Modulated -CW Radar: Range and Doppler Measurement	T1, R1	1	Chalk & Talk, PPT
		2.9	Block Diagram FM-CW Radar	T1, R1	1	Chalk & Talk, PPT
		2.10	FM_CW altimeter	T1, R1	1	Chalk & Talk, PPT
		2.11	Measurement errors	T1, R1	1	Chalk & Talk, PPT
		2.12	Multiple Frequency CW Radar.	T1, R1	1	Chalk & Talk, PPT
MID I EXAMINATION DURING SIXTH WEEK						
3	CO 3. **Know** working principles of different types of RADARs. **[K3]**	**UNIT–III: MTI AND PULSE DOPPLER RADAR**				
		3.1	Introduction, Description of operation , MTI Radar with-Power Amplifier Transmitter	T1, R1	2	Chalk & Talk, PPT
		3.2	Power Oscillator Transmitter	T1, R1	1	Chalk & Talk, PPT
		3.3	Delay Line Cancellers	T1, R1	1	Chalk & Talk, PPT
		3.4	Filter Characteristics, Blind Speeds	T1, R1	1	Chalk & Talk, PPT
		3.5	Double Cancellation, Staggered PRFs	T1, R1	1	Chalk & Talk, PPT
		3.6	Range Gated Doppler Filters	T1, R1	1	Chalk & Talk, PPT
		3.7	MTI Radar Parameters, Limitations to MTI Performance	T1, R1	1	Chalk & Talk, PPT
		3.8	Equipment instability, Internal fluctuation, Limiting in MTI Radar	T1, R1	1	Chalk & Talk, PPT
		3.9	Non-coherent MTI	T1, R1	1	Chalk & Talk, PPT
		3.10	MTI versus Pulse Doppler radar	T1, R1	1	Chalk & Talk, PPT
4	CO 4. Contrast the different methods used for tracking	**UNIT–IV: TRACKING RADAR**				
		4.1	Tracking with Radar	T1, R1		Chalk & Talk, PPT
		4.2	Types of Tracking Radar	T1, R1		Chalk &

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	targets. [K4]					Talk, PPT
		4.3	Angle Tracking, Sequential Lobing, Conical Scan	T1, R1	2	Chalk & Talk, PPT
		4.4	Boxcar generator	T1, R1	1	Chalk & Talk, PPT
		4.5	Automatic gain control, Squint angle, Other considerations	T1, R1	1	Chalk & Talk, PPT
		4.6	Mono-pulse Tracking	T1, R1	1	Chalk & Talk, PPT
		4.7	Amplitude comparison mono pulse	T1, R1	1	Chalk & Talk, PPT
		4.8	Hybrid tracking system	T1, R1	1	Chalk & Talk, PPT
		4.9	Phase comparison mono pulse	T1, R1	1	Chalk & Talk, PPT
		4.10	Target Reflection Characteristics and Angular Accuracy	T1, R1	1	Chalk & Talk, PPT
		4.11	Amplitude fluctuations	T1, R1	1	Chalk & Talk, PPT
		4.12	Angle fluctuations, Receiver and servo noise	T1, R1	1	Chalk & Talk, PPT
		4.13	Summary of errors, Frequency agility and glint reduction	T1, R1	1	Chalk & Talk, PPT
		4.14	Low angle tracking	T1, R1	1	Chalk & Talk, PPT
		4.15	Tracking in Range, Acquisition	T1, R1	1	Chalk & Talk, PPT
		4.16	Comparison of Trackers.	T1, R1	1	Chalk & Talk, PPT
			UNIT–V: RADAR ANTENNAS			
5	CO 4. **Demonstrate** the knowledge of solving issues related to different RADAR problems. **[K2]**	5.1	Antenna Parameters: Directive gain, power gain, effective aperture	T1, R1	2	Chalk & Talk, PPT
		5.2	polarization, side lobe radiation, aperture efficiency	T1, R1	2	Chalk & Talk, PPT
		5.3	Parabolic Reflector Antennas, Lens Antennas	T1, R1	1	Chalk & Talk, PPT
		5.4	Cosecant- Squared Antenna Pattern, Radomes.	T1, R1	2	Chalk & Talk, PPT
		5.5	Detection of Radar Signals in Noise: Introduction, Matched Filter Receiver.	T1, R1	1	Chalk & Talk, PPT
		5.6	Response Characteristics of Matched Filter Receiver	T1, R1	1	Chalk & Talk, PPT
		5.7	Derivation of Matched Filter Receiver, Correlation detection, Detection criteria	T1, R1	1	Chalk & Talk, PPT
		5.8	Detector Characteristics, Automatic Detection	T1, R1	1	Chalk & Talk, PPT
		5.9	Constant False Alarm Rate Receiver	T1, R1	1	Chalk & Talk, PPT
				Total	65	
	END EXAMINATIONS					

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Text Books:
T1 Merrill I. Skolnik, —Introduction to Radar Systemsl, 3 rd Edition, Tata McGraw Hill, 2001.

Reference Books:

R1 G.S.N. Raju, —Radar Engineering and fundamentals of Navigational Aidsl, I.K International, 2008.

R2 Byron Edde,lRadar: Principles, Technologies, Applicationsl, Pearson Education, 2008.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

Department of Electronics & Communication Engineering

Lesson Plan

Course Code	Course Title (Regulation)	Year & Sem	Branch	Contact Periods/Week	Sections
R20EC3201	Microwave and Optical Communications	III - II	Electronics & Communication Engineering	5	A,B,C,D

COURSE OUTCOMES: Students are able to

CO1: Summarize the field components and analyze different modes in waveguide. **[K2]**

CO2: Interpret different microwave components and devices. **[K2]**.

CO3: Experiment with microwave measurements through bench setup. **[K3]**

CO4: Classify different types of Optical fibers. **[K4]**.

CO5: Categorize the optical sources, optical detectors and explain digital receiver **[K4]**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
Unit-1: Microwave Transmission Lines						
1	CO1: Summarize the field components and analyze different modes in waveguide. [K2]	1.1	Introduction	T1, R1,R4	1	Chalk & Talk, PPT & Tutorial
		1.2	Microwave Spectrum and Bands	T1, R1,R4	1	Chalk & Talk, PPT
		1.3	Applications of Microwaves	T1, R1,R4	1	Chalk & Talk
		1.4	Rectangular Waveguides – TE	T1, R1,R4	1	Chalk & Talk, PPT
		1.5	TM mode analysis	T1, R1,R4	1	Chalk & Talk, PPT
		1.6	Expressions for Fields	T1, R1,R4	1	Chalk & Talk, PPT
		1.7	Dominant and Degenerate Modes	T1, R1,R4	1	Chalk & Talk, PPT
		1.8	Introduction to Circular wave guides	T1, R1,R4	1	Chalk & Talk, PPT
		1.9	related problems	T1, R1,R4	1	Chalk & Talk, PPT
Unit-2: Microwave Components & Microwave Tubes						
2	CO2: Interpret different microwave components and devices. [K2].	2.1	Waveguide Attenuators	T1, R1,R4	1	Chalk & Talk, PPT & Tutorial
		2.2	Resistive Card and Rotary Vane types	T1, R1,R4	2	Chalk & Talk, PPT
		2.3	Calculation of scattering matrix for E plane	T1, R1,R4	1	Chalk & Talk
		2.4	H plane	T1, R1,R4	1	Chalk & Talk, PPT

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		2.5	Magic Tee and Directional Coupler	T1, R1,R4	1	Chalk & Talk
		2.6	Ferrite Components	T1, R1,R4	1	Chalk & Talk, PPT
		2.7	Gyrator	T1, R1,R4	1	Chalk & Talk, PPT
		2.8	Isolator, Circulator	T1, R1,R4	2	Chalk & Talk, PPT
		2.9	Classification of Microwave Tubes	T1, R1,R4	1	Chalk & Talk, PPT
		2.10	Two Cavity Klystron – Structure	T1, R1,R4	1	Chalk & Talk, PPT
		2.11	Velocity Modulation Equation, Applegate Diagram	T1, R1,R4	1	Chalk & Talk, PPT
		2.12	Reflex Klystron – Structure, Applegate Diagram	T1, R1,R4	1	Chalk & Talk, PPT
		2.13	Travelling Wave Tube – operation	T1, R1,R4	1	Chalk & Talk, PPT
		2.14	Magnetron operation.	T1, R1,R4	1	Chalk & Talk, PPT
Unit-3: Microwave Solid State Devices & Measurements						
3	CO3: Experiment with microwave measurements through bench setup. [K3]	3.1	Gunn Diode-Principle	T1, R1,R4	1	Chalk & Talk, PPT & Tutorial
		3.2	RWH Theory	T1, R1,R4	1	Chalk & Talk, PPT
		3.3	IMPATT Diode	T1, R1,R4	1	Chalk & Talk, PPT, & Tutorial
MID I EXAMINATIONS						
		3.4	Description of Microwave Bench	T1, R1,R4	1	Chalk & Talk, PPT, & Tutorial
		3.5	Measurement of Attenuation, Frequency	T1, R1,R4	2	Chalk & Talk, PPT
		3.6	VSWR using Microwave Bench and Power measurement	T1, R1,R4	1	Chalk & Talk, PPT
		3.7	Bolometer Method	T1, R1,R4	1	Chalk & Talk, PPT
Unit-4: Overview of Optical Fiber Communication						
4	CO4: Classify different types of Optical fibers. [K4].	4.1	Historical development	T2, R3	1	Chalk & Talk, PPT & Tutorial
		4.2	the general system, advantages of optical fiber communications	T2, R3	1	Chalk & Talk, PPT & Tutorial
		4.3	Optical fiber wave guides	T2, R3	1	Chalk & Talk, PPT & Tutorial
		4.4	Introduction, Ray theory transmission	T2, R3	1	Chalk & Talk, PPT & Tutorial
		4.5	Total Internal Reflection	T2, R3	1	Chalk & Talk, PPT & Tutorial
		4.6	Acceptance angle, Numerical Aperture	T2, R3	1	Chalk & Talk, PPT & Tutorial
		4.7	Types of rays, V-number	T2, R3	1	Chalk & Talk, PPT & Tutorial

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		4.8	Mode coupling	T2, R3	1	Chalk & Talk, PPT & Tutorial
		4.9	Step Index fibers, Graded Index fibers	T2, R3	1	Chalk & Talk, PPT & Tutorial
		4.10	Single mode fibers- Cut off wavelength	T2, R3	1	Chalk & Talk, PPT & Tutorial
		4.11	Mode Field Diameter, Related problems.	T2, R3	1	Chalk & Talk, PPT & Tutorial
Unit-5: Optical Sources and Optical Detectors						
5	CO5: Categorize the optical sources, optical detectors and explain digital receiver [K4]	5.1	Structures, quantum efficiency	T2, R3	1	Chalk & Talk, PPT & Tutorial
		5.2	Modulation; Laser diodes principle	T2, R3	1	Chalk & Talk, PPT & Tutorial
		5.3	modes, threshold conditions	T2, R3	1	Chalk & Talk, PPT & Tutorial
		5.4	External quantum efficiency	T2, R3	1	Chalk & Talk, PPT & Tutorial
		5.5	Resonant frequencies, Reliability of LED&ILD.	T2, R3	2	Chalk & Talk, PPT & Tutorial
		5.6	Principle, PIN and avalanche photo diodes	T2, R3	2	Chalk & Talk, PPT & Tutorial
		5.7	Comparison of photo detectors	T2, R3	1	Chalk & Talk, PPT & Tutorial
		5.8	Temperature effect on avalanche gain	T2, R3	1	Chalk & Talk, PPT & Tutorial
		5.9	Noise in photo detectors Optical receiver operation	T2, R3	1	Chalk & Talk, PPT
		5.10	Fundamental receiver operation	T2, R3	1	Chalk & Talk
		5.11	Digital signal transmission, error sources	T2, R3	1	Chalk & Talk, PPT
		5.12	performance Receiver configuration, Digital receiver	T2, R3	1	Chalk & Talk
		5.13	Probability of Error Optical system design	T2, R3	1	Chalk & Talk
		5.14	Point-to-point links	T2, R3	1	Chalk & Talk
		5.15	Component choice and considerations	T2, R3	1	Chalk & Talk
		5.16	Link power budget, Rise time budget with examples	T2, R3	1	Chalk & Talk
Total Classes: 62						
MID II EXAMINATIONS						
END EXAMINATIONS						

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Text Books:

T1 Samuel Y. Liao, "Microwave Devices and Circuits", PHI, 3rd Edition, 1994.

T2 Gerd Keiser, "Optical fiber communications ",3rd ed.,MGH. (Units -IV to VI).

Reference Books:

R1 R.E. Collin, "Foundations for Microwave Engineering", IEEE Press, John Wiley, 2 nd Edition, 2002.

R2 Herbert J. Reich, J.G. Skalnik, P.F. Ordung and H.L. Krauss, "Microwave Principles", CBS Publishers and Distributors, New Delhi, 2004.

R3 Djafar K. Mynbaev and Lowell L. Scheiner, "Fiber Optic Communication Technology", Pearson Education Asia.

R4 M. Kulkarni, "Microwave and Radar Engineering" ,Umesh Publications, New Delhi. 3rd Edition.

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Signature of the HOD

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DEPARTMENT OF ECE
LESSON PLAN (A.Y-2024-2025)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC32MC01	EITK (R20)	III/II	ECE	2	D

COURSE OUTCOMES:

After successful completion of the course students will be able to

- Understand the philosophy of Indian Culture [K2].
- Know the Indian languages, Epics Ramayana and Mahabharata [K2].
- Acquire the information about Indian arts and architecture [K4].
- Know the spread of cultural exchange in abroad [K4].
- Know the contributions of scientists in different eras [K4].

U No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
		Unit-1. Indian Culture: An Introduction				
1	CO1: Understand the philosophy of Indian Culture [K2].	1.1	Characteristics, Significance and Geography of Indian culture	T1, R1	3	Web Resources
		1.2	Society in India through ages- Ancient period	T1, R1	1	Chalk & Talk
		1.3	Varna and jati, family and marriage in India	T1, R1	1	Chalk & Talk
		1.4	Position of women in ancient India	T1,R1	1	PPT
		1.5	Contemporary period; caste system and communalism	T1,R1	1	Chalk & Talk
		Unit-2. Indian Languages and Literature				
2	CO2: Know the Indian languages, Epics Ramayana and Mahabharata [K2].	2.1	Evolution of script and languages in India: Harappan Script and Brahmi Script	**T1, R1**	1	Web Resources
		2.2	Short History of the Sanskrit literature: The Vedas, The Brahmanas	**T1, R1**	1	Chalk & Talk
		2.3	Short History of the Sanskrit literature: Upanishads & Sutras	**T1, R1**	1	Chalk & Talk
		2.4	Epics: Ramayana	**T1, R1**	1	PPT
		2.5	Epics: Mahabharata	**T1, R1**	1	Chalk & Talk
		Unit-3. Indian Arts and Architecture				
	CO3: Acquire the information about Indian arts and architecture [K4].	3.1	Indian Art & Architecture: Hindu Temple Architecture	**T1, R1**	1	Web Resources
		3.2	Indian Art & Architecture: Buddhist Architecture	**T1, R1**	1	Chalk & Talk
		3.3	Indian Art & Architecture: Medieval Architecture	**T1, R1**	1	Chalk & Talk
		MID I EXAMINATION				
		3.4	Rise of modern theatre	T1, R1	1	Chalk & Talk
		3.5	Rise of Indian cinema	T1, R1	1	PPT

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4	CO4: Know the spread of cultural exchange in abroad [K4].	**Unit-4. Spread of Indian Culture Abroad**				
		4.1	Causes, Significance and Modes of Cultural Exchange	T2, R2	3	Web Resources
		4.2	Through Traders, Teachers, Emissaries, Missionaries and Gypsies	T2, R2	1	Chalk & Talk
		4.3	India, Central Asia through ages	T2, R2	1	Chalk & Talk
		4.4	India, Western World through ages	T2, R2	1	PPT
5	CO5: Know the contributions of scientists in different eras [K4].	**Unit 5. Education System in India**				
		5.1	Education in ancient, medieval and modern India	T2, R2	1	Web Resources
		5.2	aims of education, Science of ancient India	T2, R2	1	PPT
		5.3	aims of education, Science of Modern India	T2, R2	1	Chalk & Talk
		5.4	Scientists of ancient India,	T2, R2	1	Chalk & Talk
		5.5	Scientists of Modern India	T2, R2	1	Chalk & Talk
				Total	28	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Kapil Kapoor, "Text and Interpretation: The indian tradition" ISBN: 81246033375, 2005
T2	" Science in Samskrit", Samskrita Bharti Publisher , ISBN 13 : 978- 8187276333,2007
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	NCERT , "Position Paper On Arts ,Music, Dance Theatre", ISBN 81-7450 494-X,200
R2	The indian tradition by PM Bakshi, Universal law publishing co

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Department of Electronics and CommunicationEngineering

LESSON PLAN

Course Code	Course Title (Regulation)	Year - Semester	Branch	Contact Periods/ Week	Sections
R20EC4111	EDGE COMPUTING (R20)	IV - I	ECE	6	A, B, C & D

COURSE OUTCOMES:

CO1 To illustrate the Edge Computing use cases and outline Edge computing hardware architecture. [K2]
CO2: Make use of IoT architecture and implementation use cases. [K3]
CO3: Analyzing the layout and interface, configure of Rasberry Pi. [K4]
CO4: List out the relationships of edge computing with Rasberry Pi, with cloud protocols, industrial and commercial IoT and Edge Computing. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1. To illustrate the Edge Computing use cases and outline Edge computing hardware architecture. [K2]	Unit-1.	IoT AND EDGE COMPUTING DEFINITION AND USE CASES			
		1.1	Introduction	T1, R2	1	Chalk & Talk
		1.2	Edge Computing Scenario's and Use cases	T1, R2	1	Chalk & Talk
		1.3	Edge computing purpose	T1, R2	1	Chalk & Talk
		1.4	Edge computing definition		1	Chalk & Talk
		1.5	Edge computing hardware architectures	T2, R2	2	Chalk & Talk
		1.6	Edge platforms	T1, R2	1	Chalk & Talk
		1.7	Edge vs Fog Computing	T1,R2	1	Chalk & Talk
		1.8	Communication Modules - Edge	T1,R2	1	Chalk & Talk
		1.9	Fog and M2M.	T1,R2	1	PPT, Active Learning & Tutorial
2	CO2. Make use of IoT architecture and implementation use cases. [K3]	Unit-2.	IoT ARCHITECTURE AND CORE IoT MODULES			
		2.1	A Connected ecosystem	T1, R2	1	Chalk & Talk
		2.2	IoT versus machine-to-machine	T1, R2	1	Chalk & Talk
		2.3	IoT versus SCADA	T1, R2	2	Chalk & Talk
		2.4	The value of Network	T1, R2	1	Chalk & Talk
		2.5	Metcalfe's and Beckstroms's laws	T1, R2	2	Chalk & Talk
		2.6	IoT and Edge Architecture	T1, R2	1	Chalk & Talk
		2.7	Role of an architect	T1, R2	1	Chalk & Talk
		2.8	Understanding Implementations with examples, Example use case and deployment	T1, R2	2	Chalk & Talk
		2.9	Case study Telemedicine palliative car	T1, R2	2	Chalk & Talk
		2.10	Use case retrospective	T1, R2	1	Learning & Tutorial

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3	CO 3. Analyzing the layout and interface, configure of Rasberry Pi. [K4]	**Unit-3. RASBERRY Pi**				
		3.1	Introduction to RasberryPi	T1, R2	1	Chalk & Talk
		3.2	RasberryPi Board Hardware Layout and Pin outs	T1, R2	1	Chalk & Talk
		3.3	Configuring RasberryPi	T1, R2	1	Chalk & Talk
		3.4	Programming RasberryPi	T1, R2	1	Chalk & Talk
		3.5	Connecting RasberryPi via SSH	T1, R2	1	Chalk & Talk
			MID I EXAMINATIONS			
		3.6	Remote access tools	T1, R2	2	Chalk & Talk
		3.7	Interfacing DHT Sensor with Pi	T1, R2	1	Chalk & Talk
		3.8	Pi as Webserver	T1, R2	1	Chalk & Talk
		3.9	Pi Camera, Image & Video Processing using Pi	T1, R2	2	PPT,Tutorial
4	CO4. List out the relationships of edge computing with Rasberry Pi, with cloud protocols, industrial and commercial IoT and Edge Computing. [K4]	**Unit-4. INTERFACING RASBERRYPi & MQTT**: Implementation of Microcomputer RasberryPi and device Interfacing, Edge to Cloud Protocols-Protocols, MQTT, MQTT publish-subscribe, MQTT Architecture details, MQTT state transitions, MQTT packet structure, MQTT data types, MQTT communication formats, MQTT 3.1.1 working example.				
		4.1	Implementation of Microcomputer RasberryPi and device Interfacing	T1, R2	2	Chalk & Talk
		4.2	Edge Protocols	T1, R2	1	Chalk & Talk
		4.3	MQTT	T1, R2	1	Chalk & Talk
		4.4	MQTT publish-subscribe	T1, R2	1	Chalk & Talk
		4.5	MQTT Architecture details	T1, R2	1	Chalk & Talk
		4.6	MQTT state transitions	T1, R2	1	Chalk & Talk
		4.7	MQTT packet structure	T1, R2	2	Chalk & Talk
		4.8	MQTT data types	T1, R2	2	Chalk & Talk
		4.9	MQTT communication formats, MQTT 3.1.1 working example	T1, R2	2	PPT & Tutorial
5	CO4. List out the relationships of edge computing with Rasberry Pi, with cloud protocols, industrial and commercial IoT and Edge Computing. [K4]	**Unit 5. EDGE COMPUTING WITH RASBERRY Pi**				
		5.1	Introduction	T1, R2	2	Chalk & Talk
		5.2	Edge Computing with RasberryPi	T1, R2	2	Chalk & Talk
		5.3	Industrial and Commercial IoT	T1, R2	2	Chalk & Talk
		5.4	Edge IoT	T1, R2	2	Chalk & Talk
		5.5	Edge Computing and solutions	T1, R2	2	PPT & Tutorial
				Total	60	
MID II EXAMINATION						
END EXAMINATIONS						

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TEXT BOOKS	
T	BOOK TITLE/AUTHORS/PUBLISHER
T1	IoT Edge Computing for Architects –Second Edition, by Perry Lea, Publisher: Packet Publishing, 2020, ISBN: 9781839214806.
T2	Raspberry Pi Cookbook, 3rd Edition, by Simon Monk, Publisher: O'Reilly Media, Inc 2019,ISBN: 978149204322.
REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Fog and Edge Computing: Principles and Paradigms by Rajkumar Buyya, Satish Narayana Srirama, Wiley
R2	David Jensen, "Beginning Azure IoT Edge Computing: Extending the Cloud to the Intelligent. Edge, Microsoft Azure.

WEB SOURCE REFERENCES:

1	https://www.youtube.com/watch?v=5aepM3ek6J0
2	https://www.youtube.com/watch?v=0LWLl4oIh0E

Faculty Member **Head of the Department** **Principal**

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NEC	Narasaraopeta Engineering College (Autonomous) Yellamanda (Post), Narasaraopet- 522601

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Year - Semester	Branch	Contact Periods/Week	Sections
R23EC2101	PROBABILITY THEORY AND STOCHASTIC PROCESS (R23)	II - I	ECE	6	A, B, C, D, E, F

COURSE OUTCOMES:

After completion of this course, students would be able to

CO1. Understanding of concept of random variable. (K2)
CO2. Calculate the expectation of different random variables. (K3)
CO3. Calculate the operations of multiple random variables. (K3)
CO4.Understanding types of random processes. (K2)
CO5. Understanding of random processes and its spectral characteristics. (K2)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1 Understanding of concept of random variable. (K2)		**Unit-1: PROBABILITY AND RANDOM VARIABLE**			
		1.1	Probability introduced through Sets and Relative Frequency: Experiments and Sample Spaces, Discrete and Continuous Sample Spaces, Events	T1, R1,R3	2	Chalk & Talk, PPT
		1.2	Probability Definitions and Axioms, Joint Probability, Conditional Probability	T1, R1,R3	2	Chalk & Talk, Tutorial
		1.3	Total Probability, Bay's Theorem, Independent Events	T1, R1,R3	2	Chalk & Talk, Tutorial
		1.4	Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete, Continuous and Mixed Random Variables	T1, R1,R3	3	Chalk & Talk, PPT
		1.5	Distribution and Density functions, Properties	T1, R1,R3	2	Chalk & Talk, PPT
		1.6	Binomial, Poisson, Uniform, Gaussian, Exponential, Rayleigh	T1, R1,R3	2	Chalk & Talk, PPT
		1.7	Conditional Distribution, Conditional Density, Properties.	T1, R1,R3	2	Chalk & Talk, PPT
2	CO2 Calculate the expectation of different random variables .(K3)		**Unit-2: OPERATION ON ONE RANDOM VARIABLE – EXPECTATIONS**			
		2.1	Introduction, Expected Value of a Random Variable, Function of a Random Variable	T1, R2,R3	2	Chalk & Talk, PPT
		2.2	Moments about the Origin, Central Moments, Variance and Skew	T1, R2,R3	2	Chalk & Talk, Tutorial
		2.3	Chebychev's Inequality, Characteristic Function, Moment Generating Function	T1, R2,R3	2	Chalk & Talk, Tutorial
		2.4	Transformations of a Random Variable: Monotonic Transformations for a Continuous Random Vari...	T1, R2,R3	3	Chalk & Talk, PPT

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		2.5	Non-monotonic Transformations of Continuous Random Variable	T1, R2,R3	3	Chalk & Talk, PPT
3	CO3 Calculate the operations of multiple random variables .(K3)	**Unit-3: MULTIPLE RANDOM VARIABLES**				
		3.1	Vector Random Variables, Joint Distribution Function, Properties of Joint Distribution	T1, T2, R1,R4	2	Chalk & Talk, PPT
		3.2	Marginal Distribution Functions, Conditional Distribution and Density	T1, T2, R1,R4	2	Chalk & Talk, Tutorial
		3.3	Statistical Independence, Sum of Two Random Variables, Sum of Several Random Variables	T1, T2, R1,R4	2	
		3.4	Central Limit Theorem: Unequal Distribution, Equal Distributions	T1, T2, R1,R4	2	Chalk & Talk, Tutorial
		MID I EXAMINATIONS				
		3.5	Joint Moments about the Origin, Joint Central Moments, Joint Characteristic Functions	T1, T2, R1,R4	2	Chalk & Talk, PPT
		3.6	Jointly Gaussian Random Variables: Two Random Variables case, N Random Variables case, Properties	T1, T2, R1,R4	2	Chalk & Talk, PPT
		3.7	Transformations of Multiple Random Variables, Linear Transformations of Gaussian Random Variables	T1, T2, R1,R4	2	Chalk & Talk, PPT
4	CO 4 Understanding types of random processes. (K2)	**Unit-4: RANDOM PROCESSES – TEMPORAL CHARACTERISTICS**				
		4.1	The Random Process Concept, Classification of Processes, Deterministic and Non -deterministic Processes, Distribution and Density Functions	T1, R1,R5	3	Chalk & Talk, PPT, & Tutorial
		4.2	Concept of Stationarity and Statistical Independence. First-Order Stationary Processes,	T1, R1,R5	2	Chalk & Talk, Tutorial
		4.3	Second- Order and Wide-Sense Stationarity, Nth-order and Strict-Sense Stationarity, Time Averages and Ergodicity	T1, R1,R5	3	Chalk & Talk, Tutorial
		4.4	Autocorrelation Function and its Properties, Cross-Correlation Function and its Properties	T1, R1,R5	2	Chalk & Talk, PPT
		4.5	Covariance Functions, Gaussian Random Processes, Poisson Random Process	T1, R1,R5	2	Chalk & Talk, PPT
5	CO 5 Understanding of random processes and its spectral characteristics. (K2)	**Unit-5: RANDOM PROCESSES – SPECTRAL CHARACTERISTICS**				
		5.1	The Power Spectrum: Properties, Relationship between Power Spectrum and Autocorrelation Function	T1, R1,R3	3	Chalk & Talk, PPT, & Tutorial
		5.2	The Cross-Power Density Spectrum, Properties	T1, R1,R3	2	Chalk & Talk, PPT, & Tutorial
		5.3	Relationship between Cross-Power Spectrum and Cross-Correlation Function	T1, R1,R3	2	Chalk & Talk, PPT, & Tutorial
				Total		60
		MID II EXAMINATIONS				
		END EXAMINATIONS				

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23EC2104	ELECTRONIC DEVICES AND CIRCUITS (R23)	III	Electronics and communication Engineering	5	A, B, C, D, E, F

COURSE OUTCOMES: After completion of this course, the students would be able to

CO1: **Make Use of** P-N diodes in electronic circuits. [K3]..

CO2: **Make Use of** special diodes and rectifiers in electronic circuits. [K3].

CO3: **Examine** the operation of BJT and its applications. [K4].

CO4: **Analyze** the thermal stability of BJT. [K4].

CO5: **Examine** the operation of FET, other transistors and their applications. [K4].

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1: Make Use of** P-N diodes in electronic circuits. **[K3].**		**UNIT I: PN JUNCTION DIODE CHARACTERISTICS:**			
		1.1	Insulators, Semiconductors and Metals–Classification using Energy gap, Intrinsic and Extrinsic Semiconductors.	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		1.2	P-N Junction Diode - Formation of P-N Junction, Open Circuited P-N Junction, Biased P-N Junction - Forward Bias, Reverse Bias	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		1.3	Current Components in PN Junction Diode, Law of Junction, Diode Current Equation - Quantitative Analysis	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		1.4	V-I Characteristics of Diode - Forward Bias, Reverse Bias, Breakdown in P-N Junction Diode,	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		1.5	Temperature Dependence on V-I Characteristics, Diode Resistance- Static Resistance, Dynamic Resistance, Reverse Resistance	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		1.6	Diode Capacitance - Transition Capacitance, Diffusion Capacitance, Energy Band Diagram of PN Junction Diode & Quiz questions discussion	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial & Quiz
		1.7	Problems	T1, T2, R1	1	Chalk & Talk, Tutorial

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2	CO2: **Make Use of** special diodes and rectifiers in electronic circuits. [K3].	**UNIT II: SPECIAL DIODES AND DIODE CIRCUITS**				
		2.1	Zener diode-V-I characteristics, Applications, Zener Breakdown and Avalanche Breakdown	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		2.2	Construction, Operation, Characteristics and applications of LED, LCD	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		2.3	Construction, Operation, Characteristics and applications of Photodiode, Varactor Diode and Tunnel diode	T1, T2, R1	2	Chalk &Talk, PPT & Tutorial
		2.4	Clipping Circuits, Clipping at Two Independent Levels	T1, T2, R1	2	Chalk &Talk, PPT & Tutorial
		2.5	Peak Detector, Clamping circuits	T1, T2, R1	2	Chalk &Talk, PPT & Tutorial
		2.6	Basic Rectifier setup, Half Wave Rectifier, Full Wave Rectifier, Bridge Rectifier	T1, T2, R2	2	Chalk & Talk, PPT & Tutorial
		2.7	Inductive and Capacitive Filters, L–Section and π- Section	T1, T2, R2	2	Chalk & Talk, PPT & Tutorial
		2.8	Derive and compare rectifier parameters with and without filter and quiz questions discussion	T1, T2, R2	2	Chalk & Talk, PPT, Tutorial & Quiz
		2.9	Problems	T1, T2, R2	1	Chalk & Talk, PPT & Tutorial
3	CO3: **Examine** the operation of BJT and its applications. [K4].	**UNIT III :BIPOLAR JUNCTION TRANSISTOR (BJT):**				
		3.1	Bipolar Junction Transistor – Types, Symbols and Operation, Transistor Current Components	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
		3.2	Transistor Equation - Relation among IC, IB, ICBO, Transistor Configurations - CB, CE and CC	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		3.3	Transistor as a switch, Transistor switching times, Transistor as an Amplifier	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		3.4	Characteristics of Transistor in Common Base Configuration, Common Emitter and Common Collector Configurations - Input and output characteristics	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial & Quiz
			MID I EXAMINATION			
		3.5	Early effect, Transistor parameters,	T1, T2, R1		Chalk & Talk

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				Current amplification factor			PPT & Tutorial
			3.6	Relation among α, β, and γ, Comparison of CB, CE and CC Configurations,	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
			3.7	Punch Through/ Reach through, Typical transistor junction voltage values, Photo Transistor and quiz questions discussion	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial & quiz
			3.8	Problems	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
4	CO4: **Analyze** the thermal stability of BJT. [K4].	**UNIT IV:BJT BIASING AND THERMAL STABILITY:**					
			4.1	Need For Biasing, Operating Point, Load Line Analysis - D.C. Load Line, A.C. Load Line	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
			4.2	Biasing - Methods, Basic Stability, Fixed Bias	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
			4.3	Collector-to-base Bias and Self Bias	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
			4.4	Stabilization against variations in VBE, Ic and β, Stability Factors S, S' and S''	T1, T2, R2	2	Chalk & Talk, PPT & Tutorial
			4.5	Bias Compensation - Thermistor, Sensistor	T1, T2, R2	2	Chalk & Talk, PPT & Tutorial
			4.6	Diode Compensation for variation in ICO, Thermal Runaway, Thermal Stability and quiz questions discussion	T1, T2, R2	2	Chalk & Talk, PPT, Tutorial & Quiz
			4.7	Problems	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
5	CO5: **Examine** the operation of FET, other transistors and their applications. [K4].	**UNIT V : FET & OTHER TRANSISTORS:**					
			5.1	FET Types and Symbols - JFET and MOSFET/IGFET	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
			5.2	JFET: N- Channel and P-Channel Construction, Operation,	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
			5.3	Characteristics - Drain and Transfer, Parameters - Drain Resistance, Amplification factor, Trans conductance, Pinch-off voltage	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
			5.4	MOSFET - Types - Depletion	T1, T2, R1	2	Chalk & Talk,

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			MOSFET - N Channel and P Channel, Enhancement MOSFET - N-Channel and P-Channel			PPT & Tutorial
		5.5	Construction, Operation, Characteristics - Transfer and Drain Characteristics for Depletion and Enhancement Modes	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		5.6	Analysis of MOSFETs, Comparison between JFET and MOSFET	T1, T2, R1	2	Chalk & Talk, PPT & Tutorial
		5.7	SCR- Symbol, Two-Transistor version, UJT - Negative Resistance Property and Applications and quiz question discussion	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial & Quiz
		5.8	Problems	T1, T2, R1	1	Chalk & Talk, PPT & Tutorial
				Total	68	
MID II EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS:

1. J. Millman, C. Halkias, "Electronic Devices and Circuits", Tata McGraw-Hill, Third edition, 2010.
2. Allen Mottershed, "Electronic Devices and Circuits", PHI, 2011.
3. Salivahanan, N. Suresh Kumar, A. Vallavaraj, "Electronic Devices and Circuits" Tata McGrawHill,
Second Edition, 2008.

REFERENCES:

1. Jacob Millman, C. Halkies, C.D. Parikh, Satyabrata Jit, "Integrated Electronics", Tata McGrawHill, Second Edition, 2011.
2. R.L. Boylestad and Louis Nashelsky, "Electronic Devices and Circuit Theory", Pearson Publications, Eleventh Edition, 2013.

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3)

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DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2101	DISCRETE MATHEMATICS & GRAPH THEORY	II-I	CSE	5	ALL

CO1: Build skills in solving mathematical problems. (K3)
CO2: Comprehend mathematical principles and logic. (K4)
CO3: Demonstrate knowledge of mathematical modelling and proficiency in using mathematical software. (K6)
CO4: Manipulate and analyze data numerically and/or graphically appropriate Software. (K3)
CO5: How to communicate effectively mathematical ideas/results verbally or in writing. (K1)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT – I: MATHEMATICAL LOGIC			
1	**CO1**: Build skills in solving mathematical problems. (K3)	1.1	Statements and Notations, Connectives - Negation	T1, T2, R1	1	Chalk & Talk, PPT
		1.2	Conjunction, Disjunction, Statement Formulas and Truth tables	T1, T2, R1	1	Chalk & Talk
		1.3	Conditional and Bi Conditional Statements, Well-formed Formulas, Tautologies, Equivalence of Formulas	T1, T2, R1	1	Chalk & Talk
		1.4	Duality Law, Tautological Implications, Functionally Complete Sets of Connectives, Other Connectives	T1, T2, R1	1	Chalk & Talk, PPT
		1.5	Disjunctive Normal Forms, Conjunctive Normal Forms	T1, T2, R1	1	Chalk & Talk
		1.6	Principal Disjunctive Normal Forms, Principal Conjunctive Normal Forms	T1, T2, R1	1	Chalk & Talk
		1.7	Introduction, Validity Using Truth Tables,-I, Validity Using Truth Tables-II	T1, T2,T3, R1	1	Chalk & Talk, PPT
		1.8	Consistency of Premises, Indirect method of proof	T1, T2, R1	1	Chalk & Talk PPT
		1.9	**Predicate calculus:** Predicates, Statement Function	T1, T2, R1	1	Chalk & Talk
		1.10	Variables and Quantifiers	T1, T2, R1	1	Chalk & Talk
		1.11	Free and bound variables	T1, T2, R1, R2	1	Tutorials
		1.12	Inference Theory of Predicate Calculus-I	T1, T2, R1, R2	1	Tutorials
			ASSIGNMENT-I EXAMINATION			
			UNIT – II: SET THEORY			
	CO2: Comprehend mathematical	2.1	Operations on Sets, Principle of Inclusion-Exclusion	T1, T2,R1	1	Chalk & Talk, PPT

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2	principles and logic. (K4)	2.2	Relations: Properties	T1, T2, R1	1	Chalk & Ta
		2.3	Operations, Partition and Covering	T1, T2, R1	1	Chalk & Talk
		2.4	Transitive Closure	T1, T2, R1	1	Chalk & Talk
		2.5	Equivalence	T1, T2, R1	1	Chalk & Talk
		2.6	Compatibility	T1, T2,R1	1	PPT
		2.7	Partial Ordering	T1, T2, R1, R2	1	Chalk & Talk
		2.8	Hasse Diagrams	T1, T2, R1. R3	1	Chalk & Talk, PPT
		2.9	Functions: Bijective, Composition	T1, T2, R1, R2	1	Chalk & Talk
		2.10	Inverse, Permutation	T1, T2, R1	1	Chalk & Talk Students Seminars
		2.11	Recursive Functions	T1, T2,T3, R1	1	Chalk & Talk, Tutorials
		2.12	Lattice and its Properties	T1, T2, R1	1	Chalk & Talk
			MID-I EXAMINATION			
3	**CO3:** Demonstrate knowledge of mathematical modeling and proficiency in using mathematical software. (K6)		**UNIT – III: CAMBINATORICS AND RECURRENCE RELATIONS**			
		3.1	Basis of Counting, Permutations	T1, T2, T3, R1	1	Chalk & Talk, PPT.
		3.2	Permutations with Repetitions	T1, T2, T3, R1	1	Chalk & Talk
		3.3	Circular and Restricted Permutations	T1, T2, T3, R1	1	PPT.
		3.4	Combinations, Restricted Combinations	T1, T2, T3, R1	1	Chalk & Talk
		3.5	Binomial and Multinomial Coefficients and Theorems	T1, T2, R1	1	Chalk & Talk
		3.6	**Recurrence Relations**: Generating Functions	T1, T2, T3, R1	1	Chalk & Talk
		3.7	Function of Sequences, Partial Fractions	T1, T2, R1	1	Chalk & Talk
		3.8	Calculating Coefficient of Generating Functions	T1, T2, R1	1	Chalk & Talk PPT
		3.9	Recurrence Relations, and Formulation as Recurrence Relations.	T1, T2, T3, R1	1	Chalk & Talk Tutorials
		3.10	Solving Recurrence Relations by Substitution and Generating Functions	T1, T2, R1, R3	1	Chalk & Talk
		3.11	Method of Characteristic Roots	T1, T2, T3, R1	1	Chalk & Talk PPT
		3.12	Solving Inhomogeneous Recurrence Relations	T1, T2, T3, R1, R2	1	Chalk & Talk Tutorials
4	**CO4:** Manipulate and analyze data numerically and/or graphically appropriate Software. (K3)		**UNIT–IV: GRAPH THEORY**			
		4.1	Basic Concepts	T1, T2, R1	1	Chalk & Talk, PPT.
		4.2	Graph Theory and its Applications	T1, T2, R1	1	Chalk & Talk
		4.3	Subgraphs	T1, T2, R1	1	Chalk & Talk Students Seminars
		4.4	Graph Representations	T1, T2, R1	1	Chalk & Talk, Tutorials
		4.5	Adjacency and Incidence Matrices	T1, T2, R1	1	Chalk & Talk, Tutorials
		4.6	Isomorphic Graphs	T1, T2, R1, R	1	Chalk & Talk
		4.7	Isomorphic Graphs	T1, T2, R1, R2	1	Chalk & Talk

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		4.8	Paths and Circuits	T1, T2, R1, R3	1	Chalk & Talk PPT
		4.9	Paths and Circuits			
		4.10	Eulerian and Hamiltonian Graphs	T1, T2, R1, R2	1	Chalk & Talk
		4.11	Eulerian and Hamiltonian Graphs	T1, T2, R1, R2	1	Chalk & Talk
		4.12	Eulerian and Hamiltonian Graphs	T1, T2,R1, R2	1	Chalk & Talk PPT
	ASSIGNMENT-II EXAMINATION					
			UNIT – V: MULTI GRAPHS			
5	**CO5:** to communicate effectively mathematical ideas/results verbally or in writing. (K1)	5.1	Multigraphs	T1, T2, R1	1	Chalk & Talk PPT
		5.2	Bipartite and Planar Graphs	T1, T2, R1	1	Chalk & Talk, Tutorials
		5.3	Bipartite and Planar Graphs	T1, T2, R1	1	Chalk & Talk
		5.4	Euler's Theorem	T1, T2, R1	1	Chalk & Talk
		5.5	Euler's Theorem	T1, T2, R1	1	Chalk & Talk
		5.6	Graph Colouring and Covering	T1, T2,R1, R3	1	Chalk & Talk PPT
		5.7	Chromatic Number	T1, T2,R1, R3	1	Chalk & Talk
		5.8	Spanning Trees	T1, T2,R1, R3	1	Chalk & Talk
		5.9	Prim's and Kruskal's Algorithms	T1, T2,R1, R2	1	Chalk & Talk
		5.10	Prim's and Kruskal's Algorithms	T1, T2,R1, R2	1	Chalk & Talk PPT
		5.11	BFS and DFS Spanning Trees.	T1, T2,R1, R3	1	Chalk & Talk
		5.12	BFS and DFS Spanning Trees.	T1, T2,R1, R3	1	Chalk & Talk
			MID-II EXAMINATION			
						TOTAL:60

Text Books:

1. Discrete Mathematical Structures with Applications to Computer Science, J. P. Tremblay and P. Manohar, Tata McGraw Hill.
2. Elements of Discrete Mathematics-A Computer Oriented Approach, C. L.Liu and D. P. Mohapatra, 3rd Edition, Tata McGraw Hill.
3. Theory and Problems of Discrete Mathematics, Schaum's Outline Series, Seymour Lipschutz and Marc Lars Lipson, 3rd Edition, McGraw Hill.

Refrences:

1. Discrete Mathematics for Computer Scientists and Mathematicians, J. L.Mott, A. Kandel and T. P. Baker, 2nd Edition, Prentice Hall of India publishers.
2. Discrete Mathematics, S. K. Chakraborthy and B. K. Sarkar, Oxford press, 2011.
3. Discrete Mathematics and its Applications with Combinatorics and GraphTheory, K.H. Rosen, 7th Edition, Tata McGraw Hill.

WEB SOURCE REFERENCES:

1	https://nptel.ac.in/downloads/106106094/
2	https://nptel.ac.in/courses/106108054 (Graph theory)
3	https://onlinecourses.nptel.ac.in/noc18_ma16/unit?unit=18&lesson=19
4	https://onlinecourses.nptel.ac.in/noc18_ma16/student/home
5	https://onlinecourses.nptel.ac.in/noc18_cs53/student/home

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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601**

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2102	UHV (R23)	II-I	CSE	3	A,B,C,D,E,F,G

COURSE OUTCOMES:

- Define the terms like Natural Acceptance, Happiness and Prosperity (L1, L2)
- Identify one's self, and one's surroundings (family, society nature) (L1, L2)
- Apply what they have learnt to their own self in different day-to-day settings in real life (L3)
- Relate human values with human relationship and human society. (L4)
- Justify the need for universal human values and harmonious existence (L5)
- Develop as socially and ecologically responsible engineers (L3, L6)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Define the terms like Natural Acceptance, Happiness and Prosperity(L1,L2)		**UNIT-1 – Introduction to Value Education**			
		1.1	Introduction to Value Education	T1,R2	1	Chalk & Talk
		1.2	Right Understanding,Relationship and Physical Facility (Holistic Development and the Role of Education)	T1,R2	2	Chalk & Talk,PPT
		1.3	Understanding Value Education	T1,R2	1	Chalk & Talk
		1.4	Practice Session PS1 Sharing about Oneself	T1,R2	1	Tutorial
		1.5	Self-expolartion as the process for value education	T1,R2	1	Chalk & Talk,PPT
		1.6	Continuous Happiness and Prosperity – the Basic Human Aspirations	T1,R2	2	Chalk & Talk,PPT
		1.7	Practice Session PS2 Exploring Human Consciousness	T1,R2	1	Tutorial
		1.8	Happiness and Prosperity – Current Scenario	T1,R2	1	Chalk & Talk,PPT
		1.9	Method to Fulfill the Basic Human Aspirations	T1,R2	1	Web Resourses
		1.10	Practice Session PS3 Exploring Natural Acceptance	T1,R2	1	Tutorial
2	CO2: Identify one's self & one's surroundings		**UNIT-2 - Harmony in the Human Being**			
		2.1	Harmony in the Human Being	T1,R2	1	Chalk & Talk,PPT
		2.2	Understanding Human being as the Co-existence of	T1,R2	2	Chalk &

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	(family, society nature)(L1,L2)		the self and the body.			
		2.3	Distinguishing between the Needs of the self and the body	T1,R2	1	Chal Talk,P
		2.4	Practice Session PS4 Exploring the difference of Needs of self and body.	T1,R2	1	Tutorial
		2.5	The body as an Instrument of the self	T1,R2	1	Chalk & Talk,PPT
		2.6	Understanding Harmony in the self	T1,R2	1	Chalk & Talk,PPT
		2.7	Practice Session PS5 Exploring Sources of Imagination in the self	T1,R2	1	Tutorial
		2.8	Harmony of the self with the body	T1,R2	1	Web Resourses
		2.9	Programme to ensure self-regulation and Health	T1,R2	1	Chalk & Talk,PPT
		2.10	Practice Session PS6 Exploring Harmony of self with the body	T1,R2	1	Tutorial
3	CO3: Apply what they have learnt to their own self in different way-to-day settings in real life(L3)		UNIT-3 - Harmony in the Family and Society			
		3.1	Harmony in the Family and Society	T2,R2	1	Chalk & Talk
		3.2	Harmony in the Family – the Basic Unit of Human Interaction	T2,R2	1	Chalk & Talk,PPT
		3.3	'Trust' – the Foundational Value in Relationship	T2,R2	1	Chalk & Talk,PPT
		3.4	Practice Session PS7 Exploring the Feeling of Trust	T2,R2	1	Tutorial
		3.5	'Respect' – as the Right Evaluation	T2,R2	1	Web Resourses
			MID I EXAMINATION			
		3.6	Practice Session PS8 Exploring the Feeling of Respect	T2,R2	1	Chalk & Talk,PPT
		3.7	Other Feelings, Justice in Human-to-Human Relationship	T2,R2	1	Chalk & Talk,PP
		3.8	Understanding Harmony in the Society	T2,R2	1	Chalk & Talk,PPT
		3.9	Vision for the Universal Human Order	T2,R2	1	Web Resourses
		3.10	Practice Session PS9 Exploring Systems to fulfil Human Goal	T2,R2	1	Tutorial
4	CO4: Relate human values with human relationship & human society(L4)		UNIT-4 - Harmony in the Nature/Existence			
		4.1	Harmony in the Nature/Existence	T2,R2	1	Chalk & Talk
		4.2	Understanding Harmony in the Nature	T2,R2	1	Chalk & Talk,PPT
		4.3	Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature	T2,R2	2	Web Resourses
		4.4	Practice Session PS10 Exploring the Four Orders of Nature	T2,R2		Tutorial

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Reference Books

1. *JeevanVidya: EkParichaya,* A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 1999.
2. *Human Values*, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. *The Story of Stuff* (Book).
4. *The Story of My Experiments with Truth* - by Mohandas Karamchand Gandhi
5. *Small is Beautiful* - E. F Schumacher.
6. *Slow is Beautiful* - Cecile Andrews
7. *Economy of Permanence* - J C Kumarappa
8. *Bharat Mein Angreji Raj* – PanditSunderlal
9. *Rediscovering India* - by Dharampal
10. *Hind Swaraj or Indian Home Rule* - by Mohandas K. Gandhi
11. *India Wins Freedom* - Maulana Abdul Kalam Azad
12. *Vivekananda* - Romain Rolland (English)
13. *Gandhi* - Romain Rolland (English)

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		4.5	Realizing Existence as Co-existence at All Levels	T2,R2	1	Chalk & Talk,PPT
		4.6	The Holistic Perception of Harmony in Existence	T2,R2	1	Chalk & Talk,PPT
		4.7	Practice Session PS11 Exploring Co-existence in Existence.	T2,R2	1	Tutorial
		UNIT-5 - Implications of the Holistic Understanding – a Look at Professional Ethics				
		5.1	Implications of the Holistic Understanding – a Look at Professional Ethics	T2,R2	1	Chalk & Talk,PPT
		5.2	Natural Acceptance of Human Values	T2,R2	1	Chalk & Talk
		5.3	Definitiveness of (Ethical) Human Conduct	T2,R2	1	Chalk & Talk,PPT
		5.4	Practice Session PS12 Exploring Ethical Human Conduct	T2,R2	1	Tutorial
5	CO5: Justify the need for universal human values & harmonious existence(L5) CO6: Develop as socially & ecologically responsible engineers(L3,L6)	5.5	A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order	T2,R2	2	Chalk & Talk,PPT
		5.6	Competence in Professional Ethics	T2,R2	1	Web Resourses
		5.7	Practice Session PS13 Exploring Humanistic Models in Education	T2,R2	1	Tutorial
		5.8	Holistic Technologies, Production Systems and Management Models-Typical Case Studies	T2,R2	2	Chalk & Talk,PPT
		5.9	Strategies for Transition towards Value-based Life and Profession	T2,R2	1	Web Resourses
		5.10	Practice Session PS14 Exploring Steps of Transition towards Universal Human Order	T2,R2	1	Tutorial
				Total	53	
	MID II EXAMINATION DURING SIXTEENTH WEEK					
	END EXAMINATIONS					

Textbook and Teachers Manual

a. The Textbook

R R Gaur, R Asthana, G P Bagaria, *A Foundation Course in Human Values and Professional Ethics*, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1

b. The Teacher's Manual

R R Gaur, R Asthana, G P Bagaria,*Teachers' Manual for A Foundation Course in Human Values and Professional Ethics,* 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

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DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2103	DIGITAL LOGIC & COMPUTER ORGANIZATION	I	CSE	6	A,B,C,D,E,F ,G,H,I,J,K

After completion of this course the student should be able to

CO	Course Outcome Statement	
CO1	Analyze the data representation and digital logic circuits.	[K4]
CO2	Analyze the basic structure of computers.	[K4]
CO3	Analyze the computer arithmetic algorithms	[K4]
CO4	Analyze the processor, memory and input-output organizations.	[K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1: Analyze the data representation and digital logic circuits. [K4]		**Unit-1. Data Representation**			
		1.1	Number system	T1,T2, R2	2	Chalk & Talk
		1.2	Fixed point Representation	T1, T2, R2	1	Chalk & Talk
		1.3	Floating Point Representation	T1, T2, R2	1	Chalk & Talk
		1.4	Number base conversions	T1, T2, R2	1	Chalk & Talk
		1.5	Octal and Hexa decimal Numbers	T1, T2, R1	1	Chalk & Talk PPT
		1.6	components	T1, T2, R1	1	Chalk & Talk
		1.7	Signed binary numbers, Binary codes.	T1, T2, R1	2	Chalk & Talk
		1.8	**Digital Logic Circuits-I** Basic Logic Functions, Logic gates	T1, T2, R1	2	Chalk & Talk,
		1.9	universal logic gates	T1, T2, R1	1	Chalk & Talk,
		1.10	Combinational Circuits	T1, T2, R1	1	Chalk & Talk,
		1.11	Decoders, Multiplexers.	T1, T2, R1	1	Chalk & Talk,
2	CO2: Analyze the basic structure of computers. [K4]		**Unit-2. Digital Logic Circuits-II**			
		2.1	Sequential Circuits	T1, T2,R1	1	Chalk & Talk,
		2.2	Flip Flops, Binary counters	T1, T2,R1	2	Chalk & Talk,
		2.3	Ripple counters.	T1, T2,R1	1	Chalk & Talk, PPT
		2.4	Basic Structure of Computers	T1, T2,R1	2	Chalk & Talk, PPT

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			Computer Types: Functional units			
		2.5	Basic operational concepts, Bus structures.	T1, T2,R1	2	Chalk & Talk, PPT
		2.6	Software, Performance, multiprocessors and multi computers	T1, T2,R1	2	Chalk & Talk, PPT
		2.7	Computer Generations, Von-Neumann Architecture.	T1, T2,R1	1	Chalk & Talk, PPT
3	CO3: Analyze the computer arithmetic algorithms [K4]	**Unit-3. Computer Arithmetic**				
		3.1	Addition and Subtraction of Signed Numbers	T1, T2, R2	1	Chalk & Talk
		3.2	Design of Fast Adders, Multiplication of Positive Numbers	T1, T2, R2	2	Chalk & Talk, PPT
		3.3	Signed-oper and Multiplication, Fast Multiplication.	T1, T2, R2	1	Chalk & Talk , PPT
		3.4	integer Division, Floating-Point Numbers and Operations	T1, T2, R2	2	Chalk & Talk
		3.5	Processor Organization Fundamental Concepts	T1, T2, R2	2	Chalk & Talk
		3.6	Execution of a Complete Instruction, Multiple-Bus Organization	T1, T2, R2	2	Chalk & Talk
4	CO4: Analyze the processor, memory and input-output organizations. [K4]	**Unit 4 : The Memory Organization**				
		4.1	Basic Concepts, Semiconductor RAM Memories, Read-Only Memories,	T1, T3,R3	2	Chalk & Talk
		4.2	Speed, Size and Cost, Cache Memories	T1, T3,R3	1	Chalk & Talk
		4.3	Performance Considerations, Virtual Memories..	T1, T3,R3	2	Chalk & Talk
		4.4	Memory Management Requirements, Secondary Stora	T1, T3,R3	1	Chalk & Talk,
5	CO4: Analyze the processor, memory and input-output organizations. [K4]	**Unit 5. Input/Output Organization**				
		5.1	Accessing I/O Devices	T3, R2	1	Chalk & Talk
		5.2	Interrupts, Processor Examples	T3, R2	2	PPT
		5.3	Direct Memory Access	T3, R2	1	Chalk & Talk
		5.4	Buses, Interface Circuits	T3, R2	1	Chalk & Talk
		5.5	Standard I/O Interfaces.	T3, R2	2	Chalk & Talk
					TOTAL: 48	

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:tivity Plan for Term Work:

S.No	Topic/Activity	Term Work Component	Planned Hours
1.	K-Map Simplification	Seminar	7
2.	Registers, Shift Registers	Collaborative Learning/ Virtual Labs/ Active Learning or Any other learning Activity	8
3.	Hardwired Control and Multiprogrammed Control.	Flipped Learning	5
7.	Sliptest	Sliptest	8
8.	NPTEL on CAO	Online learning platforms (**MOOCs (Massive Open Online Courses). NPTEL**, and **Infosys Springboard)/ Any other online learning activity.**	20
Total No. of Hours : 48			

TEXT BOOKS: Textbooks:

1. Computer Organization, Carl Hamacher, Zvonko Vranesic, SafwatZaky,6thedition, McGrawHill
2. Digital Design, 6thEdition, M.Morris Mano, Pearson Education.
3. Organization and Architecture,William Stallings, 11thEdition, Pearson.

Reference Books:

1. Computer Systems Architecture, M.Moris Mano, 3rdEdition, Pearson
2. Computer Organization and Design,David A.Paterson, JohnL. Hennessy, Elsevier
3. Fundamentals of Logic Design, Roth, 5thEdition, Thomson

ONLINE LEARNING RESOURCES:

https://nptel.ac.in/courses/106/103/106103068/

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DEPARTMENT OF CSE
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R23CC2104	Advanced Data Structures & Algorithm Analysis (R23)	I	CSE	5	A,B,C,D,E,F & G

COURSE OUTCOMES:

After successful completion of this course, students will be able to:
CO 1: Apply asymptotic notations to measure the performance of algorithms [K3]
CO 2: Appling divide and conquer parading when an algorithmic design situation calls for it. [K3]
CO 3: Construct greedy algorithms and dynamic programming techniques to solve problems [K3]
CO 4: Utilize backtracking and branch and bound algorithms to solve combinatorial problems construct [K3]
CO 5: Classifying computational problems into NP, NP-Hard, and NP-Complete. [K4]

Unit No	Outcome		Topics/Activity	Ref./ Text Book	Hours	Delivery Method
1	CO 1: Apply asymptotic notations to measure the performance of algorithms [K3]		**Unit-1: Introduction**			
		1.1	Introduction to Algorithm Analysis	T1	1	Chalk & Talm
		1.2	Space and Time Complexity analysis	T1	1	Chalk & Talm
		1.3	Asymptotic Notations	T1	2	PPT
			AVL Trees			
		1.4	Creation	T1	1	Chalk & Talm
		1.5	Insertion	T1	2	Chalk & Talm
		1.6	Deletion operations and Applications	T1	2	Chalk & Talm
			Heap-Trees (Priority Queues)			Chalk & Talm
		1.7	Min and Max Heaps	T1	2	
		1.8	Operations and Applications	T1	2	Chalk & Talm
	FIRST ASSIGNMENT					
	CO 2: Appling divide and conquer parading when an algorithmic design situation calls for it. [K3]		**Unit-2: Graphs**			
		2.1	Terminology, Representations	T1	1	PPT
		2.2	Basic Search and Traversals	T1	2	Chalk & Talm
			Graphs			

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2		2.3	Connected Components and Biconnected Components, Applications	T1	2	Chalk & Talm
		2.4	Divide and conquer	T1	2	Chalk & Talm
		2.5	The General Method	T1	1	Chalk & Talm
		2.6	Quick Sort	T1	2	Chalk & Talm
		2.7	Merge Sort	T1	2	Chalk & Talm
		2.8	Strassen's matrix multiplication	T1	2	Chalk & Talm
3	CO 3: Construct greedy algorithms and dynamic programming techniques to solve problems [K3]	**Unit-3: Greedy Method**				
		3.1	General Method	T1	1	PPT
		3.2	Job Sequencing with deadlines	T1	1	Chalk & Talm
		3.3	Knapsack Problem	T1	2	Chalk & Talm
		3.4	Minimum cost spanning trees	T1	2	Chalk & Talm
		3.5	Single Source Shortest Paths	T1	2	Chalk & Talm
		MID I EXAMINATION				
		Dynamic Programming				
		3.6	General Method	T1	1	Chalk & Talm
		3.7	All pairs shortest paths	T1	2	Chalk & Talm
		3.8	0/1 Knapsack	T1	2	Chalk & Talm
		3.9	String Editing	T1	2	Chalk & Talm
		3.10	Travelling Salesperson problem	T1	2	Chalk & Talm
		3.11	Optimal Binary Search Trees	T1	2	Chalk & Talm
4	CO 4: Utilize backtracking and branch and bound algorithms to solve combinatorial problems construct [K3]	**Unit-4: Backtracking**				
		4.1	General Method	T1	1	Chalk & Talm
		4.2	8-Queens Problem	T1	2	Chalk & Talm
		4.3	Sum of Subsets problem	T1	2	Chalk & Talm

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4		4.4	Graph Coloring	T1	2	Chalk & Talm
		4.5	0/1 Knapsack Problem	T1	2	Chalk & Talm
			Branch and Bound			
		4.6	The General Method	T1	1	Chalk & Talm
		4.7	0/1 Knapsack Problem	T1	2	Chalk & Talm
		4.8	Travelling Salesperson problem	T1	2	Chalk & Talm
SECOND ASSIGNMENT						
5	CO 5: Classifying computational problems into NP, NP-Hard, and NP-Complete. [K4]		**Unit-5: NP Hard and NP Complete Problems**			
		5.1	Basic Concepts	T1	1	PPT
			NP Hard Graph Problems			
		5.2	Clique Decision Problem (CDP)	T1	1	Chalk & Talm
		5.3	Traveling Salesperson Decision Problem (TSP)	T1	2	Chalk & Talm
			NP Hard Scheduling Problems			
		5.4	Job Shop Scheduling	T1	2	Chalk & Talm
Total Number of Hours:66						
MID II EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS	
1	Fundamentals of Data Structures in C++, Ellis Horowitz, Sartaj Sahni, Mehta Dinesh 2nd Edition Universities Press.
2	Computer Algorithms/C++ Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran 2nd Edition University Press
REFERENCE BOOKS	
1	Data Structures and program design in C, Robert Kruse, Pearson Education Asia
2	An introduction to Data Structures with applications, Trembley & Sorenson, McGraw Hill
3	The Art of Computer Programming, Vol.1: Fundamental Algorithms, Donald E.Knuth, Addison-Wesley, 1997.
4	Data Structures using C & C++: Langsam, Augenstein & Tanenbaum, Pearson, 1995
5	Algorithms + Data Structures & Programs:, N.Wirth, PHI

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6	Fundamentals of Data Structures in C++: Horowitz Sahni & Mehta, Galgottia Pub.
7	Data structures in Java:, Thomas Standish, Pearson Education Asia
ONLINE LEARNING RESOURCES	
1	https://www.tutorialspoint.com/advanced_data_structures/index.asp
2	http://peterindia.net/Algorithms.html
3	Abdul Bari, 1. Introduction to Algorithms (youtube.com)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LESSON PLAN

Subject Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2105	Object Oriented Programming Through Java(R23)	3	CSE	6	A,B,C,D,E,F,G

After completion of this course the student should be able to

CO	Course Outcome Statement
CO1	Interpret the syntax and semantics of java programs language and OOPs concepts. [K2]
CO2	Make use of different predefined classes and packages and interfaces to develop programs using OOPs concepts. [K3]
CO3	Apply exception handling and FILE I/O operations on java programs. [K3]
CO4	Make use of Multithreading and String handling Functions on java. [K3]
CO5	Make use of Java FX in the design of GUI Applications, Event-Handling to develop GUI and JDBC connections. [K3]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
		Unit-1. Object Oriented Programming				
	CO 1: Interpret the syntax and semantics of java programs language and OOPs concepts. [K2]	1.1	Introduction to Java	T1	1	Chalk & Talk
		1.2	Writing Simple Java Programs, Elements or Tokens in Java Programs	T1	1	Chalk & Talk
		1.3	Java Statements	T1, T2, R1	2	Chalk & Talk
		1.4	Command Line Arguments, User Input to Programs	T1, T2, R2	2	Chalk & Talk
		1.5	Escape Sequences Comments, Programming Style	T1, T2, R1	1	Chalk & Talk
		1.6	Data Types, Variables, and Operators :Introduction, Data Types in Java	T1, T2, R1	1	Chalk & Talk
		1.7	Declaration of Variables, Data Types, Type Casting, Scope of Variable Identifier, Literal Constants	T1, T2, R1	2	Chalk & Talk
		1.8	Symbolic Constants, Formatted Output with printf() Method, Static Variables and Methods, Attribute Final	T1, T2, R1	1	Chalk & Talk
		1.9	Introduction to Operators, Precedence and Associativity of Operators, Assignment Operator (=), Basic Arithmetic Operators, Increment (++) and Decrement (- -) Operators,	T1, T2, R1	1	Chalk & Talk
		1.10	Ternary Operator, Relational Operators, Boolean Logical Operators, Bitwise Logical Operators	T1, T2, R1	1	Chalk & Talk, PPT
		1.11	Control Statements: Introduction, if Expression, Nested if Expressions, if–else Expressions, Ternary	T1, T2, R1	1	Chalk & Talk, PPT

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			Operator?:, Switch Statement, Iteration Statements, while Expression			
		1.12	do–while Loop, for Loop, Nested for Loop, For–Each for Loop, Break Statement, Continue Statement	T1, T2, R1	1	Chalk & Ta PPT
ASSIGNMENT I- EXAMINATION						
2	**CO2**: Make use of different predefined classes and packages and interfaces to develop programs using OOPs concepts. [K3]	**Unit-2. Classes and Objects**				
		2.1	Introduction, Class Declaration and Modifiers, Class Members, Declaration of Class Objects	T1, T2, R1	1	Chalk & Talk PPT
		2.2	Assigning One Object to Another Access Control for Class Members	T1, T2, R1	1	Chalk & Talk PPT
		2.3	Accessing Private Members of Class,	T1, T2, R1	T1	Chalk & Talk PPT
		2.4	Constructor Methods for Class, Overloaded Constructor Methods	T1, T2, R1	1	Chalk & Talk PPT
		2.5	Nested Classes, Final Class and Methods	T1, T2, R1	1	Chalk & Talk PPT
		2.6	Passing Arguments by Value and by Reference, Keyword this	T1, T2, R1	1	Chalk & Talk PPT
		2.7	Introduction, Defining Methods, Overloaded Methods	T1, T2, R1	1	Chalk & Talk, PPT
		2.8	Overloaded Constructor Methods	T1, T2, R1	1	Chalk & Talk, PPT
		2.9	Class Objects as Parameters in Methods, Access Control	T1, T2, R1	1	Chalk & Talk, PPT
		2.10	Recursive Methods, Nesting of Methods	T1, T2, R1	1	Chalk & Talk, PPT
		2.11	Overriding Methods, Attributes Final and Static	T1, T2, R1	1	Chalk & Talk, PPT
MID -1 EXAMINATIONS						
3	**CO3:**Apply exception handling and FILE I/O operations on java programs. [K3]	**Unit-3. Arrays**				
		3.1	Introduction, Declaration and Initialization of Arrays	T1, T2, R1	1	Chalk & Talk
		3.2	Storage of Array in Computer Memory, Accessing Elements of Arrays	T1, T2, R1	1	Chalk & Talk PPT
		3.3	Operations on Array Elements, Assigning Array to Another Array	T1, T2, R1	2	Chalk & Talk PPT
		3.4	Dynamic Change of Array Size, Sorting of Arrays, Search for Values in Arrays	T1, T2, R1	2	Chalk & Talk
		3.5	Class Arrays, Two-dimensional Arrays, Arrays of Varying Lengths	T1, T2, R1	2	Chalk & Talk
		3.6	Three dimensional Arrays, Arrays as Vectors	T1, T2, R1	1	Students seminar
		3.7	**Inheritance**: Introduction, Process of Inheritance, Types of Inheritances	T1, T2, R1	1	Chalk & Talk

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		3.8	Universal Super Class ,Object Class, Inhibiting Inheritance of Class Using Final, Access Control,	T1, T2, R1	1	Chalk & Tall
		3.9	Multilevel Inheritance, Application of Keyword Super, Constructor Method	T1, T2, R1	1	Chalk & Tall
		3.10	Inheritance, Method Overriding Dynamic Method Dispatch, Abstract Classes, Interfaces and Inheritance	T1, T2, R1	1	Chalk & Tall
		3.11	**Interfaces**: Introduction, Declaration of Interface, Implementation of Interface, Multiple Interfaces, Nested Interfaces, Inheritance of Interfaces	T1, T2, R1	1	Chalk & Tall
		3.12	Default Methods in Interfaces, Static Methods in Interface, Functional Interfaces, Annotations.	T1, T2, R1	1	Chalk & Tall
	ASSIGNMENT II- EXAMINATION					
		Unit 4 : Pointers & User Defined Data types				
4	**CO4**: Make use of Multithreading and String handling Functions on java. [K3]	4.1	**Packages and Java Library**: Introduction, Defining Package, Importing Packages and Classes into Programs, Path and Class Path, Access Control, P	T1, T2,R1	1	Chalk & Tall
		4.2	Packages in Java SE, Java.lang Package and its Classes, Class Object, Enumeration, class Math, Wrapper Classes, Auto-boxing and Auto-unboxing, Java util Classes and Interfaces, Formatter Class, Random Class	T1, T2,R1	1	PPT
		4.3	Time Package, Class Instant (java.time.Instant), Formatting for Date/Time in Java, Temporal Adjusters Class, Temporal Adjusters Class.	T1, T2,R1	1	Student seminar
		4.4	**Exception Handling:** Introduction, Hierarchy of Standard Exception Classes, Keywords throws and throw, try, catch, and finally Blocks,	T1, T2,R1	1	Chalk & Tall PPT
		4.5	Multiple Catch Clauses, Class throwable.	T1, T2,R1	1	Chalk & Tal PPT
		4.6	Unchecked Exceptios, Checked Exceptions	T1, T2,R1	1	Chalk & Tal
		4.7	**Java I/O and File:** Java I/O API, standard I/O streams, types,	T1, T2,R1	2	Chalk & Tal
		4.8	Byte streams, Character streams,	T1, T2,R1	1	Chalk & Tal
		4.9	Scanner class , Examples	T1, T2,R1	1	Chalk & Tal
		4.10	Files in Java	T1, T2,R1	1	Chalk & Tal
		Unit 5. Functions & File Handling				
5	**CO5:** Make use of Java FX in the design of GUI Applications,	5.1	**String Handling in Java:**, Introduction, Interface Char Sequence Characters.	T1, T2, R1	1	Chalk & Tal

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	Event-Handling to develop GUI and JDBC connections. [K3]	5.2	Class String, Methods for Extracting from Strings	T1, T2,R1	1	PPT
		5.3	Comparison, Modifying, Searching; Class String Buffer	T1, T2,R1	1	Student Seminars
		5.4	Multithreaded Programming: Introduction, Need for Multiple Threads Multithreaded Programming for Multi-core Processor,	T1, T2,R1	2	Chalk & Tal
		5.5	Thread Class, Main Thread-Creation of New Threads, Thread States, Thread Priority-Synchronization, Deadlock and Race Situations	T1, T2,R1	1	Chalk & Tal
		5.6	Inter-thread Communication - Suspending, Resuming, and Stopping of Threads	T1, T2,R1	1	Chalk & Tal PPT
		5.7	**Java Database Connectivity**: Introduction, JDBC Architecture, Installing MySQL and MySQL Connector/J,	T1, T2,R1	2	Chalk & Tal
		5.8	JDBC Environment Setup, Establishing JDBC Database	T1, T2,R1	1	Chalk &
		5.9	Connections, Result Set Interface	T1, T2,R1	1	Chalk & Tal
		5.10	**Java FX GUI**: Java FX Scene Builder, Java FX App Window Structure, ,	T1, T2,R1	1	Chalk & Tal
		5.11	displaying text and image, event handling	T1, T2,R1	1	Chalk & Tal
		5.12	laying out nodes in scene graph, mouse events	T1, T2,R1	1	Chalk & Tal
					TOTAL: 67	
			MID II EXAMINATION			
			END EXAMINATIONS			

TEXT BOOKS:

1. JAVA one step ahead, Anitha Seth, B.L.Juneja, Oxford
2. Joy with JAVA, Fundamentals of Object Oriented Programming, DebasisSamanta, MonalisaSarma, Cambridge, 2023
3. . JAVA 9 for Programmers, Paul Deitel, Harvey Deitel, 4th Edition, Pearson

REFERENCES BOOKS:

1. The complete Reference Java, 11thedition, Herbert Schildt,TMH
2. Introduction to Java programming, 7th Edition, Y Daniel Liang, Pearson

1.
2. V Cmt
3. A. Anusha
4. Rajini

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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601**

DEPARTMENT OF COMPUTER SCIENCE ENGINEERING
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	CREDITS	Contact Periods/Week	Section
R23CC2201	MEFA (R23)	II-II	CSE	2	4	A,B,C,D,E,F,G

COURSE OUTCOMES:

CO 1: Define the concepts related to Managerial Economics, financial accounting and management (L2)
CO 2: Understand the fundamentals of Economics viz., Demand, Production, cost, revenue and markets (L2)
CO 3: Apply the Concept of Production cost and revenues for effective Business decision (L3)
CO 4: Analyze how to invest their capital and maximize returns (L4)
CO 5: Evaluate the capital budgeting techniques. (L5)
CO 6: Develop the accounting statements and evaluate the financial performance of business entity (L5)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO-1:Define the concepts related to Managerial Economics, financial accounting and management (L2)	**UNIT-1 – Managerial Economics**				
		1.1	Meaning & Nature of ME	T2, R2	2	Chalk & Talk
		1.2	significance, functions of ME	T2, R2	2	Chalk & Talk,PPT
		1.3	Advantages of ME	T2, R2	1	Chalk & Talk
		1.4	Demand-Concept, Function	T2, R2	1	Tutorial
		1.5	Law of Demand	T2, R2	1	Chalk & Talk,PPT
		1.6	Demand Elasticity- Types	T2, R2	2	Chalk & Talk,PPT
		1.7	Demand Measurement	T2, R2	1	Tutorial
		1.8	Demand Forecasting Factors governing Forecasting,	T2, R2	1	Chalk & Talk,PPT
		1.9	Demand Forecasting Methods	T2, R2	1	Web Resourses
		1.10	Managerial Economics and Financial Accounting and Management	T2, R2	1	Tutorial
2	CO 2: Understand the fundamentals of Economics viz., Demand, Production,	**UNIT-2** - Production and Cost Analysis				
		2.1	Introduction – Nature	T2, R2	1	Chalk & Talk,PPT
		2.2	meaning, significance	T2, R2	1	Chalk & Talk
		2.3	functions and advantages	T2, R2	2	Chalk & Talk,PPT

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	cost, revenue and markets (L2)	2.4	Production Function	T2, R2	1	Tutorial
		2.5	Least- cost combination	T2, R2	1	Chalk & Talk,PPT
		2.6	Short run Production Function	T2, R2	1	Chalk & Talk,PPT
		2.7	long run Production Function	T2, R2	1	Tutorial
		2.8	Isoquants and Is costs	T2, R2	1	Web Resourses
		2.9	Cost & Break-Even Analysis	T2, R2	1	Chalk & Talk,PPT
		2.10	Cost concepts and Cost behaviour	T2, R2	1	Tutorial
		2.11	Break-Even Analysis (BEA)	T2, R2	1	Chalk & Talk,PPT
		2.12	Determination of Break-Even Point (Simple Problems).	T2, R2	3	Chalk & Talk,PPT
3	CO-3:Apply the Concept of Production cost and revenues for effective Business decision (L3)		**UNIT-3 - Business Organizations and Markets**			
		3.1	Introduction – Forms of Business Organizations	T2,R2	1	Chalk & Talk
		3.2	Sole Proprietary	T2,R2	1	Chalk & Talk,PPT
		3.3	Partnership	T2,R2	1	Chalk & Talk,PPT
		3.4	Joint Stock Companies	T2,R2	1	Tutorial
		3.5	Public Sector Enterprises	T2,R2	1	Web Resourses
			MID I EXAMINATION			
		3.6	Types of Markets	T2,R2	1	Chalk & Talk,PPT
		3.7	Perfect and Imperfect Competition	T2,R2	1	Chalk & Talk,PPT
		3.8	Features of Perfect Competition Monopoly-	T2,R2	1	Chalk & Talk,PPT
		3.9	Monopolistic Competition	T2,R2	1	Web Resourses
		3.10	Oligopoly-Price-Output Determination	T2,R2	1	Tutorial
		3.11	Pricing Methods and Strategies	T2,R2	2	Chalk & Talk,PPT
4	CO 4: Analyze how to invest their capital and maximize returns (L4) CO-5: Evaluate the capital budgeting techniques. (L5)		**UNIT-4 - Capital Budgeting**			
		4.1	Introduction – Nature,	T2,R2	1	Chalk & Talk
		4.2	meaning, significance	T2,R2	1	Chalk & Talk,PPT
		4.3	Types of Working Capital, Components	T2,R2	2	Web Resourses
		4.4	Sources of Short-term and Long-term Capital,	T2,R2	1	Tutorial
		4.5	Estimating Working capital	T2,R2	1	Chalk &

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			requirements.			Talk,PPT
		4.6	Capital Budgeting– Features, Proposals	T2,R2	1	Chalk & Talk,PPT
		4.7	Methods and Evaluation	T2,R2	1	Tutorial
		4.8	Projects- Pay back Method, Accounting Rate of Return (ARR)	T2,R2	3	Chalk & Talk,PPT
		4.9	Net Present Value (NPV) Internal Rate Return (IRR) Method (sample problems)	T2,R2	3	Chalk & Talk,PPT
			UNIT-5 - Financial Accounting and Analysis			
5	CO 6: Develop the accounting statements and evaluate the financial performance of business entity (L5)	5.1	Introduction – Concepts and Conventions	T2,R2	2	Chalk & Talk,PPT
		5.2	Double-Entry Bookkeeping	T2,R2	1	Chalk & Talk
		5.3	Journal	T2,R2	3	Chalk & Talk,PPT
		5.4	Ledger	T2,R2	2	Tutorial
		5.5	Trial Balance	T2,R2	2	Chalk & Talk,PPT
		5.6	Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).	T2,R2	4	Web Resourses
		5.7	Introduction to Financial Analysis	T2,R2	1	Tutorial
		5.8	Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability.	T2,R2	4	Chalk & Talk,PPT
				Total	73	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Textbooks:-

1. Varshney & Maheswari: Managerial Economics, Sultan Chand.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

Reference Books:-

1. Ahuja Hl Managerial economics Schand.
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi.
4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage.

G. Nagaraju
P. Krishna Sunil

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DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2201	Probability and Statistics	II-II	CSE	5	A,B,C,D,E,F&G

Course Outcomes:

After completion of this course, the students would be able to:

CO221.1	Classify the concept of data science and its importance	(K2)
CO221.2	Interpret the association of characteristics and through correlation and regression tools	(K4)
CO221.3	Apply discrete and continuous probability distributions	(K3)
CO221.4	Design the components of a classical hypothesis test	(K6)
CO221.5	Infer the statistical internal methods based on small and large sample tests	(K4)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO-1: Classify the concept of data science and its importance (K2).		**UNIT-I : Descriptive Statistics and methods for data science**			
		1.1	Introduction to Data science	T1, T2, R1	1	Chalk & Talk PPT
		1.2	Population Vs sample, collection of Data	T1, T2, R1	1	Chalk & Talk
		1.3	Types of Variables	T1, T2, R1	1	Chalk & Talk
		1.4	Data Visualization charts	T1, T2, R2	1	Chalk & Talk
		1.5	Mean, median,, mode	T1, T2, R1	1	Chalk & Talk
		1.6	Geometric mean, Harmonic mean	T1, T2, R1	1	Chalk & Talk
		1.7	Range, variance,	T1, T2, R1	1	Chalk & Talk
		1.8	Mean & deviation	T1, T2, R1	1	Chalk & Talk
		1.9	Skewness	T1, T2, R1	1	Chalk & Talk
		1.10	kurtosis	T1, T2, R1	1	Chalk & Talk
			ASSIGNMENT-I EXAMINATION			
2	CO-2: Interpret the association of characteristics and through correlation and regression tools (K4).		**UNIT – II: CORRELATION AND CURVE FITTING**			
		2.1	Types of correlation	T1, T2,R1	1	Chalk & Talk PPT
		2.2	Coefficient of correlation	T1, T2,R1	1	Chalk & Talk,
		2.3	Rank correlation coefficient	T1, T2,R1	1	Chalk & Talk,
		2.4	Regression Coefficient and Regression Equation	T1, T2,R1	1	Chalk & Talk
		2.5	Multiple linear Regression	T1, T2,R1	1	Chalk & Talk
		2.6	Fitting a straight Line-Method of least squares	T1, T2,R1	1	Chalk & Talk
		2.7	Fitting a Parabola	T1, T2,R1	1	Chalk & Talk
		2.8	Fitting a Exponential curve	T1, T2,R2	1	Chalk & Talk,
		2.9	Fitting a Power Curve	T1, T2,R1	1	Chalk & Talk
			MID-I EXAMINATION			
			UNIT-III :Probability Distributions			

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3	CO-3: Apply discrete and continuous probability distributions (K3).	3.1	Introduction to Probability	T1, T2, R1	1	Chalk & PPT
		3.2	Conditional Probability, aye's theorem	T1, T2, R1	1	Chalk & Talk
		3.3	Discrete Random Variables	T1, T2, R1	1	Chalk & Talk,
		3.4	Continuous Random variables	T1, T2, R3	1	Chalk & Talk,
		3.5	Distribution function	T1, T2, R1	1	Chalk & Talk
		3.6	Mathematical expectation	T1, T2, R1	1	Chalk & Talk,
		3.7	variance	T1, T2, R1	1	Chalk & Talk
		3.8	Binomial distribution	T1, T2, R3	1	Chalk & Talk Student seminar
		3.9	Poisson and uniform distribution	T1, T2, R1	1	Chalk & Talk
		3.10	Normal Distribution	T1, T2, R1	1	Chalk & Talk
			ASSIGNMENT-II EXAMINATION			
4	CO-4: Design the components of a classical hypothesis test (K6).		**UNIT-IV :SAMPLING THEORY**			
		4.1	Introduction to Sampling Theory	T1, T2,R1	1	Chalk & Talk, PPT
		4.2	Population Vs sample	T1, T2,R1	1	Chalk & Talk
		4.3	Sampling distribution of means	T1, T2,R1	1	Chalk & Talk
		4.4	Sampling distribution of variances	T1, T2,R1	1	Chalk & Talk
		4.5	Central Limit theorem	T1, T2,R1	1	Chalk & Talk
		4.6	Introduction to t distribution	T1, T2,R1	1	Chalk & Talk
		4.7	Point Estimation	T1, T2,R2	1	Chalk & Talk
		4.8	Interval Estimation	T1, T2,R1	1	Chalk & Talk,
		4.9	Maximum error of estimate	T1, T2,R1	1	Chalk & Talk
5	CO-5: Infer the statistical internal methods based on small and large sample tests (K4).		**UNIT-V: TESTING OF HYPOTHESIS**			
		5.1	Introduction to Tests of Hypothesis	T1, T2, R1	1	Chalk & Talk, PPT
		5.2	Formulation of Null Hypothesis, critical region, level of significance	T1, T2,R1	1	Chalk & Talk
		5.3	One Tail, Two tailed Tests Type-I, and Type-II errors	T1, T2,R1	1	Chalk & Talk Tutorial
		5.4	Large sample test -single mean	T1, T2,R1	1	Chalk & Talk
		5.5	Large sample test, two means	T1, T2,R1	1	Chalk & Talk
		5.6	Large sample test -single proportion	T1, T2,R1	1	Chalk & Talk
		5.7	Large sample test -Double proportion	T1, T2,R1	1	Chalk & Talk
		5.8	Small samples-Students t Test	T1, T2,R1	1	Chalk & Talk
		5.9	F-Test	T1, T2,R4	1	Chalk & Talk, web resources
		5.10	Chi Square Test	T1, T2,R1	1	Chalk & Talk Student seminar
			MID-II EXAMINATION			
						TOTAL:48

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S.No	Topic/Activity	Term Work Component	Planned Hours
1	Types of variables, Data Visualization charts, Skewness, kurtosis, Distribution function, Sampling distribution of means and variance.	Seminar	12
2	Coefficient of correlation, Conditional Probability, Introduction to t distribution, f distribution, Chi Square distribution,	Flipped Learning	8
3	Slip test	Slip test	10
4	Mean deviation, S.D, Fitting a Parabola, Normal Distribution, Tests of Hypothesis	Problem Solving	12
Total No. of Hours : 42			

Text Books:

1.Miller and Freund's, "Probability and Statistics for Engineers",7/e, Pearson, 2008.
2.S. C. Gupta and V.K. Kapoor, "Fundamentals of Mathematical Statistics", 11/e, Sultan Chand & Sons Publications, 2012.

References:

1.Shron L. Myers, Keying Ye, Ronald E Walpole, Probability and Statistics Engineers and the Scientists,8th Edition, Pearson 2007.
2. Jay l. Devore, Probability and Statistics for Engineering and the Sciences, 8 th Edition, cengage.
3. Sheldon M. Ross, "Introduction to probability and statistics Engineers and the Scientists", 4 th Edition, Academic Foundation, 2011.
4.Johannes Ledolter and Robert V. Hogg, "Applied statistics for Engineers and Physical Scientists", 3 rd Edition, Pearson, 2010.

WEB SOURCE REFERENCES:

1	https://archive.nptel.ac.in/courses/111/105/111105090/
2	https://onlinecourses.nptel.ac.in/noc21_ma74/preview
3	https://archive.nptel.ac.in/courses/111/106/111106112/
4	https://archive.org/details/NPTEL-Math-Probability_and_Statistics
5	https://onlinecourses.nptel.ac.in/noc22_ma81/preview

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LESSON PLAN

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R23CC2203	OPERATING SYSTEMS	II/II	CSE	5	A, B, C, D, E, F & G

Names of faculty

After completion of this course the student should be able to

CO	Course Outcome Statement
CO1	Classify various operating system generations, functions and services. [K2]
CO2	Analyze process scheduling, management and synchronization. [K4]
CO3	Analyze deadlock prevention, detection, avoidance and recovery techniques [K4]
CO4	Analyze various memory management and storage management techniques [K4]
CO5	Analyze the concepts of file system [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Tot alPe riods	Delivery Method
			Unit-1			
1	**CO 1** Classify various operating system generations, functions and services. [K2]	1.1	Operating Systems Overview	T1	1	Chalk & Talk
		1.2	Operating Systems Introduction	T1	1	Chalk & Talk
		1.3	Operating system functions	T1	1	Chalk & Talk
		1.4	Operating systems operations	T1	1	Chalk & Talk
		1.5	Computing environments, Free and Open-Source Operating Systems	T1	1	Chalk & Talk
		1.6	Operating System Services, User and Operating-System Interface	T1	1	Chalk & Talk
		1.7	System calls, Types of system calls	T1	1	Chalk & Talk
		1.8	System Programs	T1	1	Chalk & Talk
		1.9	Operating system Design and Implementation, Operating System structures	T1	1	Chalk & Talk PPT
		1.10	Building and Booting an Operating System, Operating system debugging	T1	1	Chalk & Talk
			Unit-2			
2	**CO 2** Analyze process scheduling, management and synchronization. [K4]	2.1	Process Concept	T1	1	Chalk & Talk
		2.2	Process scheduling	T1	1	Chalk & Talk
		2.3	Operations on processes	T1	1	Chalk & Talk
		2.4	Inter-process communication	T1	1	Chalk & Talk PPT
		2.5	Thread libraries	T1	1	Chalk & Talk PPT

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		2.6	Threading issues	T1	1	Chalk & Talk
		2.7	Basic concepts, Scheduling criteria	T1	1	Chalk & Talk
		2.8	Scheduling algorithms	T1	1	Chalk & Talk
		2.9	Multiple processor scheduling	T1	1	Chalk & Talk
3	**CO 3** Analyze deadlock prevention, detection, avoidance and recovery techniques [K4]	**Unit-3**				
		3.1	The Critical Section Problem	T1	1	Chalk & Talk
		3.2	Peterson's Solution	T1	1	Chalk & Talk
		3.3	Mutex Locks, Semaphores	T1	1	Chalk & Talk
		3.4	Monitors, Structured analysis	T1	1	Chalk & Talk
		3.5	Classic problems of Synchronization	T1	1	Chalk & Talk PPT
		3.6	System Model, Deadlock characterization	T1	1	Chalk & Talk
		3.7	Methods for handling Deadlocks, Deadlock prevention	T1	1	Chalk & Talk
		3.8	Deadlock avoidance	T1	1	Chalk & Talk
		3.9	Deadlock detection	T1	1	Chalk & Talk
		3.10	Recovery from Deadlock	T1	1	Chalk & Talk
MID I EXAMINATION DURING NINTH WEEK						
4	**CO 4** Analyze various memory management and storage management techniques [K4]	**Unit-4**				
		4.1	Memory-Management Introduction	T1	1	Chalk & Talk
		4.2	Contiguous memory allocation	T1	1	Chalk & Talk
		4.3	White-Box testing, Debugging	T1	1	Chalk & Talk
		4.4	Paging, Structure of the Page Table	T1	1	Chalk & Talk PPT
		4.5	Smoke testing, and Some general issues associated with testing.	T1	1	Chalk & Talk
		4.6	Virtual Memory Management Introduction	T1	1	Chalk & Talk
		4.7	Demand paging, Copy-on-write	T1	1	Chalk & Talk PPT
		4.8	Page replacement	T1	1	Chalk & Talk
5	**CO 5** Analyze the concepts of file system [K2]	**Unit-5**				
		5.1	Overview of Mass Storage Structure	T1	1	Chalk & Talk
		5.2	HDD Scheduling	T1	1	Chalk & Talk
		5.3	File concept, Access methods	T1	1	Chalk & Talk
		5.4	Directory Structure	T1	1	Chalk & Talk PPT
		5.5	File-system structure	T1	1	Chalk & Talk
		5.6	File-system Operations	T1	1	Chalk & Talk
		5.7	Directory implementation	T1	1	Chalk & Talk
		5.8	Allocation method	T1	1	Chalk & Talk
		5.9	Free space management	T1	1	Chalk & Talk
		5.10	File- System Mounting	T1	1	Chalk & Talk PPT
		5.11	Partitions and Mounting, File Sharing	T1		Chalk & Talk

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MID II EXAMINATION DURING EIGHTEENTH WEEK
END EXAMINATIONS
Total No. of Hours: 48

Activity Plan for Term Work:

S.No	Topic/Activity	Term Work Component	Planned Hours
1.	1. Fork(), wait() System calls 2. Process Life cycle 3. Co-operative Process Communication 4. Page fault Handling in operating systems Bankers algorithm	Seminar	5
2.	1. Operating system generations 2. Round Robin Scheduling algorithm How to characterize a good operating system design?	Collaborative Learning/ Virtual Labs/ Active Learning or Any other learning Activity	5
3.	1. CPU scheduling algorithms 2, Disk Scheduling algorithms	Flipped Learning	5
4.	Make a simple Operating System	Micro Project	12
5.	Slip test	Slip test	5
6	Operating System Design, Causes of Operating Systems Failure.	Online learning platforms (MOOCs (Massive Open Online Courses), NPTEL, and Infosys Springboard)/ Any other online learning activity.	10
			Total No. of Hours: 42

Text Book:

T1: Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018.

T2: Modern Operating Systems, Tanenbaum A S, 4 th Edition, Pearson , 2016

Reference Book:

R1: Operating Systems -Internals and Design Principles, Stallings W, 9 th edition, Pearson, 2018

R2: Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3 rd Edition, McGraw- Hill, 2013

WEB RESOURCES:

W1: https://nptel.ac.in/courses/106/106/106106144/

W2: https://peterindia.net/OperatingSystems.html

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Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R23CC2204	DATABASE MANAGEMENT SYSTEM (R23)	II/II	CSE	5	A ,B,C ,D,E,F&G

LESSON PLAN

COURSE OUTCOMES

After completion of the course, the students would be able to:

CO 1: Interpret the fundamentals of DBMS. [K2]
CO 2: Analyze relational database designing. [K4]
CO 3: Develop queries in RDBMS [K3]
CO 4: Analyze database design methodology and normalization process [K4].
CO 5: Analyze transaction concepts and File indexing. [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			Unit-1			
1	**CO 1:** Interpret the fundamentals of DBMS. [K2]	1.1	Introduction: Database system	T1, T2	2	Chalk & Talk + PPT
		1.2	Characteristics (Database Vs File System)	T1, T2	2	Chalk & Talk
		1.3	Database Users, Advantages of Database systems, Database applications.	T1, T2	2	Chalk & Talk + PPT
		1.4	Brief introduction of different Data Models; Concepts of Schema, Instance and data independence;	T1, T2	2	Chalk & Talk + PPT
		1.5	Three tier schema architecture for data independence;	T1, T2	2	Chalk & Talk + PPT
		1.6	Database system structure, environment, Centralized and Client Server architecture for the database.	T1, T2	2	Chalk & Talk + PPT
		1.7	Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set	T1, T2	1	Chalk & Talk + PPT
		1.8	constraints, sub classes, super class, inheritance, specialization, generalization using ER Diagrams.	T1, T2	2	Chalk & Talk + PPT

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ASSIGNMENT 1 EXAMINATION						
Unit-2						
2	**CO2:** Analyze relational database designing. [K4]	2.1	Relational Model: Introduction to relational model, concepts of domain, attribute, tuple, relation, importance of null values	T1, T2	2	Chalk & Talk + PPT
		2.2	constraints (Domain, Key constraints, integrity constraints) and their importance,	T1	2	Chalk & Talk + PPT
		2.3	Relational Algebra, Relational Calculus	T1	2	Chalk & Talk + PPT
		2.4	BASIC SQL: Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update).	T1	2	Chalk & Talk + PPT
MID 1 EXAMINATION						
Unit-3						
3	**CO3**: Develop queries in RDBMS [K3]	3.1	SQL: Basic SQL querying (select and project) using where clause, arithmetic & logical operations	T1	2	Chalk & Talk
		3.2	SQL functions (Date and Time, Numeric, String conversion). Creating tables with relationship	T1	1	PPT
		3.3	Implementation of key and integrity constraints, nested queries, sub queries	T1	2	Chalk & Talk
		3.4	grouping, aggregation, ordering	T1	1	Chalk & Talk
		3.5	Implementation of different types of joins, view(updatable and non-updatable), relational set operations.	T1	2	Chalk & Talk
ASSIGNMENT 2 EXAMINATION						
Unit-4						
4	**CO4:** Analyze database design methodology and normalization process [K4].	4.1	Schema Refinement (Normalization):Purpose of Normalization or schema refinement	T1, T2	2	Chalk & Talk + PPT
		4.2	concept of functional dependency,	T1, T2	3	Chalk & Talk
		4.3	Normal forms based on functional dependency Lossless join and	T1, T2	2	Chalk & Talk + PPT

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			dependency preserving decomposition			
		4.4	1NF,2NFand 3NFconcept of surrogate key, Boyce-Codd normal form(BCNF), MVD, Fourth normal form(4NF), Fifth Normal Form (5NF).	T1, T2	1	Chalk & Talk
Unit-5						
5	**CO5:** Analyze transaction concepts and File indexing. [K2]	5.1	Transaction Concept: Transaction State, ACID properties	T1, T2	1	Chalk & Talk
		5.2	Concurrent Executions, Serializability, Recoverability	T1, T2	2	Chalk & Talk + PPT
		5.3	Implementation of Isolation, Testing for Serializability, lock based, time stamp based	T1, T2	2	Chalk & Talk
		5.4	optimistic, concurrency protocols, Deadlocks, Failure Classification, Storage, Recovery and Atomicity, Recovery algorithm.	T4	2	PPT
		5.5	Introduction to Indexing Techniques: B+ Trees, operations on B+Trees, Hash Based Indexing:	T4	2	Chalk & Talk
MID 2 EXAMINATION						
					Total	48

Activity Plan for Term Work:

S.No	Topic/Activity	Term Work Component	Planned Hours
1	1NF, 2NF and 3 Concept of surrogate key, Boyce- Codd normal form(BCNF), MVD, Fourth normal form(4NF), Fifth Normal Form (5NF)	Seminar, Hands-On	9
2	BASIC SQL: Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update).	Collaborative Learning, Hands-On or Any other learning Activity	8
3	BASIC SQL: Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update).	Project based learning, Collaborative Learning, Hands-On with SQLDATABASE or Any other learning Activity	5
4	Sliptest	Sliptest	10

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5	Exploring online tutorials and courses on SQL	Online learning platforms (**MOOCs (Massive Open Online Courses), Edureka, Coursera** and **Infosys Springboard / Any other online learning activity.**	10

Total No. of Hours : 42

Text Books:

T1	Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
T2	Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)

Reference Books:

R1	Introduction to Database Systems, 8thedition, C J Date, Pearson.
R2	Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson
R3	Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

Web Resources:

1	https://nptel.ac.in/courses/106/105/106105175/
2	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012758066672820 22456_shared/overview

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R23CC2205	SOFTWARE ENGINEERING	II/II	CSE	5	A, B, C, D, E, F & G

After completion of this course the student should be able to

CO	Course Outcome Statement
CO1	Analyze Software Life Cycle models. [K4]
CO2	Analyze the importance of software requirement and project management [K4]
CO3	Analyze various types of software design techniques [K4]
CO4	Analyze Software testing and quality management [K4].
CO5	Analyze various CASE tools and software maintenance process models. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO 1** Analyze Software Life Cycle models. [K4]		**Unit-1**			
		1.1	Introduction: Evolution	T1	1	Chalk & Talk
		1.2	Software development projects	T1	1	Chalk & Talk
		1.3	Exploratory style of software developments	T1	1	Chalk & Talk
		1.4	Emergence of software engineering	T1	2	Chalk & Talk
		1.5	Notable changes in software development practices	T1	1	Chalk & Talk
		1.6	Software Life Cycle Models: Basic concepts	T1	1	Chalk & Talk
		1.7	Waterfall model and its extensions	T1	1	Chalk & Talk
		1.8	Rapid application development	T1	1	Chalk & Talk
		1.9	Spiral model.	T1	1	Chalk & Talk PPT
2	**CO 2** Analyze the importance of software requirement and project management [K4]		**Unit-2**			
		2.1	Software project management complexities.	T1	1	Chalk & Talk
		2.2	Metrics for project size estimation	T1	1	Chalk & Talk
		2.3	Project estimation techniques	T1	1	Chalk & Talk
		2.4	COCOMO	T1	2	Chalk & Talk PPT
		2.5	Halstead's software science.	T1	1	Chalk & Talk
		2.6	Risk management.	T1	1	Chalk & Talk
		2.7	Requirements gathering and analysis	T1	1	Chalk & Talk
		2.8	Software Requirements Specification.	T1	2	Chalk & Talk

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		2.9	Algebraic specification	T1	1	Chalk & Talk
		2.10	Executable specification and 4GL	T1	1	Chalk & Talk
		Unit-3				
3	**CO 3** Analyze various types of software design techniques [K4]	3.1	Software Design: Overview of the design process	T1	1	Chalk & Talk
		3.2	Layered arrangement of modules	T1	1	Chalk & Talk
		3.3	Cohesion and Coupling approaches to software design	T1	1	Chalk & Talk
		3.4	Agility: Agility and the Cost of Change, Agile Process	T1	1	Chalk & Talk
		3.5	Function-Oriented Software Design: Overview of SA/SD methodology	T1	2	Chalk & Talk PPT
		3.6	Structured analysis	T1	1	Chalk & Talk
		3.7	Developing the DFD model of a system	T1	1	Chalk & Talk
		3.8	Structured design, Detailed design, and Design Review	T1	1	Chalk & Talk
		3.9	User Interface Design: Basic concepts, Types of user interfaces	T1	1	Chalk & Talk
		3.10	Fundamentals of component-based GUI development, and user interface design methodology.	T1	1	Chalk & Talk PPT
MID I EXAMINATION DURING NINTH WEEK						
		Unit-4				
4	**CO 4** Analyze Software testing and quality management [K4].	4.1	Coding And Testing: Coding, Code review, Software documentation	T1	1	Chalk & Talk
		4.2	Testing, Black-box testing	T1	1	Chalk & Talk
		4.3	White-Box testing, Debugging	T1	1	Chalk & Talk
		4.4	Integration testing, Testing object-oriented programs	T1	1	Chalk & Talk
		4.5	Smoke testing, and Some general issues associated with testing.	T1	1	Chalk & Talk
		4.6	Software Reliability And Quality Management: Software reliability, Software quality	T1	2	Chalk & Talk PPT
		4.7	ISO 9000.SEI Capability maturity model.	T1	1	Chalk & Talk
		Unit-5				
5	**CO 5** Analyze various CASE tools and software maintenance process models. [K4]	5.1	Computer-Aided Software Engineering (Case): CASE and its scope	T1	1	Chalk & Talk
		5.2	CASE environment	T1	1	Chalk & Talk
		5.3	CASE support in the software life cycle	T1	2	Chalk & Talk
		5.4	Software Maintenance: Characteristics of software maintenance	T1	1	Chalk & Talk PPT
		5.5	Software maintenance process models	T1	1	Chalk & Talk
		5.6	Estimation of maintenance cost.	T1	1	Chalk & Talk
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						
						Total No. of Hours: 48

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Activity Plan for Term Work:

S.No	Topic/Activity	Term Work Component	Planned Hours
1.	1. Agile development model 2. Formal system specification, Axiomatic specification. 3. Characteristics of a good user interface 4. Software quality management system 5. Software reverse engineering	Seminar	5
2.	1. Computer System Engineering 2. Responsibilities of a software project manager 3. How to characterize a good software design?	Collaborative Learning/ Virtual Labs/ Active Learning or Any other learning Activity	5
3.	1. Program analysis tools 2, Memory Usage Considerations.	Flipped Learning	5
4.	Real-World Software Systems Development	Micro Project	12
5.	Slip test	Slip test	5
6	Software Design, Software Testing.	Online learning platforms (MOOCs (Massive Open Online Courses), NPTEL, and Infosys Springboard)/ Any other online learning activity.	10
			Total No. of Hours: 42

Text Book:

T1: Fundamentals of Software Engineering, Rajib Mall, 5th Edition, PHI

T2: Software Engineering A Practitioner's Approach, Roger S. Pressman, 9th Edition, Mc-Graw Hill International Edition.

Reference Book:

R1: Software Engineering, Ian Sommerville,10thEdition, Pearson

R2: Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.

WEB RESOURCES:

W1: https://nptel.ac.in/courses/106/105/106105182/

W2: https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012605895063871 48827_shared/overview

W3 https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_013382690411003 904735_shared/overview

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LESSON PLAN Academic Year(2024-2025)

Course Code	Course Title (Regulation)	Year/Sem	Branch	Contact Periods/Week	Sections
R20CC3101	Operating System (R20)	III/I	CSE	5	A ,B,C &D

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO 1: Classify various operating system functionalities and generations. [K2]
CO 2: Interpret process management and exemplify the process synchronization techniques. [K2]
CO 3: Apply various process scheduling algorithms. [K3]
CO 4: Distinguish various memory management techniques and apply various deadlock techniques. [K4]
CO 5: Compare and contrast various disk scheduling algorithms and can interpret the file system implementations. [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Classify various operating system functionalities and generations.		**UNIT-1** Computer System and Operating System Overview:			
		1.1	Computer System and Operating System Overview: Overview of Operating System - What operating systems do, User view, System view, defining operating systems;	T1	2	Chalk & Talk, PPT
		1.2	Operating Systems functions- Process Management, Memory Management, Storage Management, File-System Management, Mass-Storage Management, Caching, Protection and security;	T1	2	Chalk & Talk, PPT
		1.3	Distributed systems, Special purpose systems, Real-Time Embedded Systems, Multimedia Systems, Handheld Systems, Operating Systems Structures, Simple Structure, Layered Approach, Micro Kernels, Modules;	T1	2	Chalk & Talk, PPT
		1.4	Systems Calls- Process control, File management, Device management,	T1	2	Chalk & Talk, PPT

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			Information maintenance, Communication;			
		1.5	Operating systems generation.	T1	2	Chalk & Talk, PPT
			UNIT-2. PROCESS MANAGEMENT			
2	CO2: Interpret process management and exemplify the process synchronization techniques. CO3: Apply various process scheduling algorithms	2.1	Process Management: Process, Process States, Process Control Block, Process Scheduling, Scheduling Queues, Schedulers;	T1	2	Chalk & Talk,PPT
		2.2	Operations- Process Creation, Process termination; Inter process communication- Shared-Memory Systems, Message-Passing Systems, Naming, Synchronization	T1	2	Chalk & Talk, PPT
		2.3	Multi Thread programming models- Many to one, One to one, Many to Many model	T1, R1	2	Chalk & Talk, PPT
		2.4	Process Scheduling Criteria- CPU scheduler, Preemptive scheduling, Dispatcher, Scheduling Criteria	T1, R1	2	Chalk & Talk, PPT
		2.5	CPU Scheduling Algorithms- First Come First Serve, Shortest job first, Priority Scheduling, Round robin scheduling.	T1, R2	2	Chalk & Talk, PPT
			UNIT-3. CONCURRENCY			
3	CO2: Interpret process management and exemplify the process synchronization techniques. CO3: Apply various process scheduling algorithms	3.1	Concurrency: Process Synchronization, The Critical-Section Problem, Peterson's Solution, Synchronization Hardware. Semaphores- Usage, Implementation, Deadlock and Starvation	T1, R3	2	Chalk & Talk, Tutorial
		3.2	Classic Problems of Synchronization- Bounded buffer problem	T1, R3	2	Chalk & Talk, PPT
		3.3	Readers writers' problem, Dining-Philosophers problem;	T1, R3	2	Chalk & Talk, PPT
		3.4	Monitors- Usage, Dining-Philosophers solution using monitors.	T1, R3	3	Chalk & Talk, PPT
			MID I EXAMINATION			
		3.5	**Memory Management**: Swapping, Contiguous Memory Allocation-	T1.. R1	3	Chalk &

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			Memory Allocation, Fragmentation;			Talk, & Tutorial, Demonstration with models.
		3.6	Paging- Basic Method, Hardware Method, Protection, shared pages; Structure of the Page table- Hierarchical Paging, Hashed Page Tables. Segmentation- Basic Method, hardware	T1, R1	4	Chalk & Talk, PPT
4	CO 4: Distinguish various memory management techniques and apply various deadlock techniques.		**UNIT 4. Virtual Memory Management & Principles of Deadlock**			
		4.1	**Virtual Memory Management**: Virtual Memory. Demand Paging- Basic concept, copy on write;	T1,R1	1	Chalk &Talk, PPT
		4.2	Page-Replacement Algorithms- Basic page replacement, FIFO page replacement, optimal page replacement, LRU page replacement, LFU page replacement	T1,T2	2	Chalk & Talk, PPT, Collaborative Learning
		4.3	Thrashing- Cause of Thrashing, Working set model, Page fault frequency	T1,R1	2	Chalk & Talk, Seminar, PPT
		4.4	**Principles of Deadlock**: Deadlock System Model. Deadlock Characterization- Necessary Conditions, Resource allocation graph	T1, R1	2	Chalk & Talk, PPT, Seminar
		4.5	Deadlock Prevention- Mutual exclusion, Hold and wait, No preemption, Circular wait;	T1, R1	2	Chalk & Talk, PPT
		4.6	Deadlock Detection and Avoidance- Resource allocation Graph algorithm, Banker's algorithm, Single instance of each resource type, several instances of each resource type;	T1, R1	2	Chalk & Talk, PPT, Active and Collaborative Learning
		4.7	Recovery Form Deadlock- Process termination, Resource preemption	T1, R1	1	Chalk & Talk, PPT

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5	CO 5: Compare and contrast various disk scheduling algorithms and can interpret the file system implementation	UNIT 5. File System				
		5.1	File System: The Concept of a File- file attributes, file operations, file types, file structures; Access Methods- sequential access, direct access, other access methods	T1, R1	2	Chalk & Talk, PPT
		5.2	Directory Structure single level directory, two level directories, tree structured directory, general graph directory; File Sharing- multiple users, remote file systems;	T1, R1	3	Chalk & Talk, PPT
		5.3	Protection- types of access, access control. **Implementing File System**: File System Structure. File System Implementation- overview, partitions and mounting, virtual file systems;	T1, R1	2	Chalk & Talk, PPT
		5.4	Allocation Methods- contiguous allocation, linked allocation, indexed allocation; Free-Space Management- linked list, grouping, counting.	T1,, R1	2	Chalk & Talk, PPT
		5.5	Disk Scheduling- FCFS scheduling, SSTF scheduling, SCAN scheduling, C-SCAN scheduling, LOOK scheduling.	T1	3	Chalk & Talk, PPT, Active and Flipped Learning, Web resources, MOOCS
				Total	60	
MID II EXAMINATION						
END EXAMINATIONS						

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Text Books:

T1 : Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7/e, John Wiley, 2016.

Reference Books:

R1 Operating Systems – Internal and Design Principles Stallings, 6/e, Pearson Education, 2005

R2 Operating Systems – A Concept based Approach – D.M.Dhamdhere, 2/e, TMH, 2005.

R3 Operating System a Design Approach-Crowley, 1/e, TMH, 2005..

R4 Andrew S Tanenbaum , "Modern Operating Systems", PHI, 3/e, 2013.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN
Academic Year(2024-2025)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC3102	Data warehousing and Data Mining		Computer Science and Engineering	5	A, B, C, D

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO 1. Interpret the data mining terminology and types of data to be mined.[K2]

CO 2. Outline the need and importance of preprocessing techniques. [K2]

CO 3. Interpret data warehousing concepts and operations. [K2]

CO 4. Compare and contrast different dominant Data Mining Algorithms. [K2]

CO 5. Analyze the performance Association Rules. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1. Interpret the data mining terminology and types of data to be mined.[K2]		**UNIT-1. Introduction to data mining**			
		1.1	Introduction to data mining:	T1, R4	1	Chalk & Talk
		1.2	What Is Data Mining, -Motivating Challenges	T1, R4	1	Chalk & Talk
		1.3	The Origins of Data Mining, -Data Mining Tasks, -	T1, R4	1	Chalk & Talk
		1.4	Types of Data: Attributes and Measurement, Types of Data Sets, -	T1, R4	2	Chalk & Talk
		1.5	Data Quality: Measurement and Data Collection Issues, Issues Related to Applications.	T1, R4	2	Chalk & Talk
ASSIGNMENT EXAM – I						
2	CO2. Outline the need and importance of preprocessing techniques. [K2]		**UNIT-2. Data Preprocessing & Exploring data**			
		2.1	Data:- Data Preprocessing: Aggregation, Sampling, Dimensionality Reduction, Feature Subset Selection, Feature Creation,	T1, R4	2	Chalk & Talk,
		2.2	Discretization and Binarization, Variable Transformation,	T1, R4	2	Chalk & Talk
		2.3	-Measures of similarity and dissimilarity: Basics, Similarity and Dissimilarity between Simple Attributes, Dissimilarities between Data Objects, Similarities between Data Objects, Examples of Proximity Measures.	T1, R4	3	Tutorials
		2.4	Exploring data: -The Iris Data set, -	T1, R4	2	PPT
		2.5	Summary Statistics: Frequencies and the Mode, Percentiles, Measures of Location: Mean and Median, Measures of Spread: Range and Variance, Multivariate Summary Statistics, Other Ways to Summarize the Data.	T1, R4	3	Chalk & Talk

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		ASSIGNMENT EXAM – II				
3	CO3. Interpret data warehousing concepts and operations. [K2]	UNIT-3. Data Warehouse and OLAP Tech. for Data Mining				
		3.1	What is a Data Warehouse, -A Multidimensional Data Model	T2, R3	2	Chalk & Talk,
		3.2	: From tables to data cubes, Stars, snowflake, and fact constellations(schemas for multidimensional databases),	T2, R3	2	PPT,
		3.3	Examples for defining star, snowflake, and fact constellation schemas, Measures(their categorization and computation),	T2, R3	2	Tutorials
		3.4	Introducing concept hierarchies, OLAP operations in the multidimensional data model, A starnet query model for querying multidimensional databases, -	T2, R3	2	PPT,
		3.5	Data Warehouse Architecture: Steps for the design and construction of data warehouses, A three-tier data warehouse architecture, OLAP server architectures: ROLAP vs. MOLAP vs. HOLAP, SQL extensions to support OLAP operations, -	T2, R3	2	Chalk & Talk,
		3.6	Data Warehouse implementation: Efficient computation of data cubes, Indexing OLAP data, Efficient processing of OLAP queries, Metadata repository,	T2, R3	2	Chalk & Talk,
		3.7	Data warehouse back-end tools and utilities, -Further development of data cube technology: Discovery-driven exploration of data cubes, Complex aggregation at multiple granularities (Multifeature cubes),	T2, R3	2	PPT
		3.8	-From data warehousing to data mining: Data warehouse usage, From online analytical processing to online analytical mining.	T2, R3	2	Chalk & Talk,
		MID I EXAMINATION DURING SIXTH WEEK				
4	CO4. Compare and contrast different dominant Data Mining Algorithms. [K2]	UNIT-4. Classification				
		4.1	Classification: Basic Concepts, Decision Trees, and Model Evaluation: - Preliminaries, - General Approach to Solving a Classification Problem,	T1, T2, R1	2	Chalk & Talk,
		4.2	Decision Tree Induction: How a Decision Tree Works, How to Build a Decision Tree, Methods for Expressing Attribute Test Conditions, Measures for Selecting the Best Split, Algorithm for Decision Tree Induction, -	T1, T2, R1	2	Chalk & Talk,
		4.3	Model Overfitting: Overfitting Due to Presence of Noise, Overfitting Due to Lack of Representative Samples, -Evaluating the Performance of a Classifier: Holdout Method, Random Subsampling, Cross-Validation, Bootstrap.	T1, T2, R1	2	PPT
		4.4	Classification: alternative techniques: - Bayesian classifier: Bayes Theorem, Using Bayes theorem for classification, Naïve Bayesian classifier.	T1, T2, R1	2	Seminars
		ASSIGNMENT EXAM – III				
5	CO5. Analyze the performance	UNIT 5. Association Analysis				
		5.1	Association Analysis: Basic Concepts and Algorithms: -Problem Definition, -Frequent Itemset Generation: The Apriori principle,	T1, T2, R1	2	Chalk & Talk,

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	Association Rules. [K4]		Frequent Itemset Generation in the Apriori Algorithm,			
		5.2	Candidate Generation and Pruning, Support Counting, -Rule Generation: Confidence-Based Pruning, -Compact Representation of Frequent Itemsets: Maximal Frequent Itemsets, Closed Frequent Itemsets, -	T1, T2, R1	2	Chalk & Talk
		5.3	FP-Growth algorithms: FP-Tree Representation, Frequent Itemset Generation in FP-Growth Algorithm.	T1, T2, R1	2	Collabrative learning
		5.4	Association Analysis: Advanced Concepts: -Handling Categorical Attributes, -Handling Continuous Attributes: Discretization-Based Methods, Statistics-Based Methods, Non-discretization Methods.	T1, T2, R1	2	Chalk & Talk
	ASSIGNMENT EXAM – IV					
			UNIT 5. Cluster Analysis			
	CO6. Summarize various application layer protocols [K2].	5.5	Cluster Analysis: Basic Concepts and Algorithms: -Overview: What is Cluster Analysis? Different Types of Clustering, Different Types of Clusters, -	T1, T2, R1	2	Chalk & Talk
		5.6	K-means: The Basic K-means Algorithm, K-means Additional Issues, Bisecting K-means, K-means and Different Types of Clusters, Strengths and Weaknesses, -	T1, T2, R1	2	Collabrative learning
		5.7	Agglomerative Hierarchical Clustering: Basic Agglomerative Hierarchical Clustering Algorithm, Specific Techniques, -	T1, T2, R1	2	Collabrative learning
		5.8	DBSCAN: Traditional Density (center based approach), The DBSCAN algorithm, Strengths and Weaknesses.	T1, T2, R1	2	Chalk & Talk
				Total	60	
	MID II EXAMINATION DURING EIGHTEENTH WEEK					
	END EXAMINATIONS					

Text Books:

T1 Introduction to Data Mining: Pang-Ning tan, Michael Steinbach, Vipin kumar, Addision-Wesley.

T2 Data Mining, Concepts and Techniques, 2/e, Jiawei Han, Micheline Kamber, Elsevier, 2006.

Reference Books:

R1 Data Mining: Introductory and Advanced Topics, Margaret H Dunham, Pearson, 2008.

R2 Introduction to Data Mining with Case Studies: GK Gupta; Prentice Hall.

R3 Fundamentals of data warehouses, 2/e , Jarke, Lenzerini, Vassiliou, Vassiliadis, Springer.

R4 Data Mining Theory and Practice, Soman, Diwakar, Ajay, PHI, 2006.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LESSON PLAN (AY: 2024-2025)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC3103	DESIGN AND ANALYSIS OF ALGORITHMS	I	Computer Science and Engineering	5	A,B,C&D

COURSE OUTCOMES: Students are able to

CO 1: Apply asymptotic notations to measure the performance of algorithms [K3].
CO 2: Apply divide-and-conquer paradigm when an algorithmic design situation calls for it [K3].
CO 3: Identify all feasible solutions to get optimal solutions using greedy method [K3].
CO 4: Apply dynamic-programming approach, to solve real world problems [K3].
CO 5: Apply fundamental graph traversal techniques to solve various applications using Backtracking [K3].
CO 6: Analyze least cost and FIFO branch and bound paradigms [K4].

Unit No	Outcome		Topics/Activity	Ref Text book	Total Hours	Delivery Method
1	CO 1. Apply asymptotic notations to measure the performance of algorithms [K3].		**Unit-1. Introduction to Algorithms**			
		1.1	**Introduction:** Algorithm	T1	2	Chalk & Talk, PPT
		1.2	Algorithm Specification	T1	2	Chalk & Talk, PPT
		1.3	Performance Analysis	T1	1	Chalk & Talk, PPT
		1.4	Space complexity	T1	1	Chalk & Talk, PPT
		1.5	Time complexity	T1	2	Chalk & Talk, PPT
		1.6	Asymptotic Notations	T1	1	Chalk & Talk, PPT
		1.7	Big-oh notation	T1	1	Chalk & Talk, PPT
		1.8	Omega notation	T1	1	Chalk & Talk, PPT
		1.9	Theta notation	T1	1	Chalk & Talk, PPT
			I ASSIGNMENT EXAMINATION			
2	CO2. Apply divide-and-conquer paradigm when an algorithmic design situation calls for it [K3].		**Unit-2. Divide and Conquer**			
		2.1	Introduction to Divide and Conquer	T1	2	Chalk & Talk, PPT
		2.2	General method	T1	2	Chalk & Talk, PPT
		2.3	Binary search	T1	2	Chalk & Talk, PPT
		2.4	Merge sort	T1	2	Chalk & Talk, PPT
		2.5	Quick sort	T1	2	Chalk & Talk, PPT
		2.6	Strassen's matrix multiplication	T1	2	Chalk & Talk, PPT
3	CO 3. Identify all feasible solutions to get optimal solutions using greedy method [K3].		**Unit-3. Greedy Method**			
		3.1	Introduction to Greedy method	T1	1	Chalk & Talk, PPT
		3.2	General method	T1	1	Chalk & Talk, PPT
		3.3	Knapsack problem	T1	2	Chalk & Talk, PPT
		3.4	Job sequencing with deadlines	T1	2	Chalk & Talk, PPT
			I MID EXAMINATION			
		3.5	Minimum cost spanning trees	T1	3	Chalk & Talk, PPT, Tutorial
		3.6	Single source shortest paths	T1	2	Chalk & Talk, PPT

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		Unit-4. Dynamic Programming				
4	CO 4. Apply dynamic-programming approach, to solve real world problems [K3].	4.1	Introduction to Dynamic Programming	T1	1	Chalk & Talk, PPT
		4.2	The General method	T1	1	Chalk & Talk, PPT
		4.3	All pairs shortest path problem	T1	2	Chalk & Talk, PPT, Tutorial
		II ASSIGNMENT EXAMINATION				
		4.4	Optimal binary search trees	T1	2	Chalk & Talk, PPT
		4.5	0/1 knapsack, Reliability design	T1	2	Chalk & Talk, PPT
		4.6	The Travelling sales person problem	T1	1	Chalk & Talk, PPT
		4.7	Matrix-chain multiplication.	T1	2	Chalk & Talk, PPT
		Unit 5. Back Tracking, Branch and Bound				
5	CO 5. Summarize the functions of different remote monitoring protocols. [K2]. CO 6. Analyze least cost and FIFO branch and bound paradigms [K4].	5.1	Introduction to Backtracking	T1	1	Chalk & Talk, PPT
		5.2	The General method	T1	1	Chalk & Talk, PPT
		5.3	N-Queen problem	T1	2	Chalk & Talk, PPT
		5.4	Sum of subsets	T1	1	Chalk & Talk, PPT
		5.5	Graph coloring,	T1	1	Chalk & Talk, PPT, Tutorial
		5.6	Hamiltonian cycles.	T1	2	Chalk & Talk, PPT
		5.7	Branch and Bound:	T1	1	Chalk & Talk, PPT
		5.8	The method	T1	1	Chalk & Talk, PPT
		5.9	0/1 knapsack problem	T1	2	Chalk & Talk, PPT, Tutorial
		5.10	Travelling sales person problem	T1	2	Chalk & Talk, PPT
				Total	**60**	
		MID II EXAMINATION				
		END EXAMINATIONS				

Text Books:

T1 Fundamentals of Computer Algorithms, Second Edition – Ellis Horowitz, Sartaj Sahni and Sanguth Rajasekaran, Universities Press.

Reference Books:

R1 S. Sridhar, Oxford, Design and Analysis of Algorithms, First Edition –.

R2 T.H.Cormen, C.E.Leiserson, R.L.Rivest and C.Stein , Introduction to Algorithms, second edition, , Pvt.Ltd Dreamtech.Distributed Network Management, Paul, John Wiley.

R3 Parag Himanshu Dave, Himanshu Bhalchandra Dave , Design and Analysis of Algorithms, Second Ec –, Pearson Education.

R4 Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman , Design and Analysis of Computer Algorithr Pearson Education.

R5 Anany Levitin , Introduction to the Design and Analysis of Algorithms, Third Edition –, Pe Education.

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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601** **DEPARTMENT OF CSE**

LESSON PLAN –AY: 2023-24

PROGRAMME: B.Tech CSE	
COURSE: **Computer Networks**	Year/Sem : **III/I A/B/C/D** CREDITS: **3**
COURSE CODE: **R20CC3104** REGULATION: **R20**	COURSE TYPE (CORE /ELECTIVE / BREADTH/ S&H): **Core**
COURSE AREA/DOMAIN: **CSE**	PERIODS: 6 Per Week.

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO 1: Summarize basic concepts of Data Communication and Networking. [K2]
CO 2: Compare and Contrast OSI and TCP/IP reference models. [K2]
CO 3: Interpret data link layer services and multiple access protocols. [K2]
CO 4: Analyze different routing protocols. [K4]
CO 5: Illustrate the essential principles of different transport layer protocols. [K2]
CO 6: Summarize various application layer protocols. [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Summarize basic concepts of Data Communication and Networking.		**UNIT-1 Introduction**			
		1.1	OSI Overview TCP/IP and Other Network Models,	T1	4	Chalk & Talk, Active Learning & Tutorial
		1.2	Examples of Networks: Novell Networks, Arpanet, Internet,	T1	3	
		1.3	Network Topologies: WAN, LAN, MAN.	T1	3	
2	CO2: Compare and Contrast OSI and TCP/IP reference models. CO3: Interpret data link layer services and multiple access protocols		**UNIT-2. Data Link Layer**			
		2.1	Design Issues- Framing, Services Provided to Network Layer,	T1	3	Chalk & Talk, PPT Case Study
		2.2	Flow Control, Error Control, Error Detection and Correction-CRC,	T1	3	
		2.3	Checksum-Idea, One's Complement, Hamming code.	T1	2	
		2.4	**IEEE Standards:** 802.3, 802.11.	T1, R1	2	
3	CO2: Compare and Contrast OSI and TCP/IP reference models.		**UNIT-3. Elementary Data Link Layer Protocols**			
		3.1	Simplex Protocol, Simplex Stop and Wait, Simplex Protocol for Noisy Channel.	T1, R2	4	Chalk & Talk, Tutorial
		3.2	**Sliding Window**	T1, R2	3	

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	CO3: Interpret data link layer services and multiple access protocols		**Protocol**: One Bit, Go Back N, Selective Repeat-Stop and Wait Protocol,			Chalk & Talk
		3.3	Examples Of Data Link Protocols- HDLC, PPP.	T1, R2	3	
			MID I EXAMINATION			
		4.1	**Medium Access Control Sub Layer:** Chanel Allocation Problem, ALOHA,	T1, R2	3	Chalk & Talk, & Tutorial, , , Demonstration with models.
		4.2	Carrier Sense Multiple Access (CSMA), CSMA With Collision Detection, CSMA with Collision Avoidance,	T1, R2	4	
4	CO 4: Analyze different routing protocols.		**UNIT 4. Network Layer**			
		5.1	**Network Layer**: Network Layer Design Issues- Store and Forward Packet Switching,	T1, R1	2	Chalk &Talk, Tutorial, & Project based learning
		5.2	Service Provided to Transport Layer,	T1, T2	2	
		5.3	Connection Oriented and Connection Less Service, Comparison of Virtual Circuit and Datagram Subnets.	T1, R1	3	
		5.4	**Routing Algorithms:** Optimality Principle, Shortest Path Routing, Flooding,	T1, R1	3	
		5.5	Hierarchical Routing, Broad Cast, Multi Cast,	T1, R1	2	
		5.6	Distance Vector Routing, Link State Routing.	T1, R1	1	
		5.7	**Network Layer in Internet**: IP Protocol, IP Address, IPv4 frame format.	T1, R1	2	
5	CO 5: Illustrate the essential principles of different transport layer protocols. CO 6: Summarize various application layer protocols.		**Unit-5. Transport Layer**			
		6.1	**Transport Layer:** The Transport Services- Services Provided to the Upper Layer, Transport Service Primitives, Elements of Transport Protocol-Addressing, Connection Establishment, Connection Release.	T1, R1	3	Chalk & Talk, PPT Tutorial, Active Learning & Seminars
		6.2	**The Internet Transport Protocols**: TCP and UDP.	T1, R1	3	

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		6.3	**Application Layer: DNS**(Domain Naming System)-DNS Namespace, Name Servers,	T1, R2	3	
		6.4	Electronic Mail-Architecture and Services, Message Format-MIME, Sending and Receiving E-mail, Message Transfer-SMTP.	T1, R2	2	
		6.5	**The World Wide Web-** Architecture Overview, URL, HTTP.	T1, R2	3	Chalk and Talk
				Total	66	
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

T1: Andrew S Tanenbaum, "Computer Networks, Pearson Education/PHI, 4th Edition.
T2: Behrouz A.Forouzan, "Data Communications and Networks", TMH, Third Edition,

Reference Books:

R1 COMPUTER NETWORKS – S.Keshav, "An Engineering Approach to Computer Networks", Pearson Education 2nd Edition,

R2 COMPUTER NETWORKS – W.A. Shay, Thomson, "Understanding Communications and Networks", 3rd Edition.

FACULTY 8/7/2024 HOD PRINCIPAL

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN – Academic Year: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CS3105	Compiler Design(R20)	I	Computer Science and Engineering	6	A ,B,C& D

COURSE OUTCOMES: After successful completion of this course, students will be able to:

CO 1: Summarize different phases and passes of a compiler. [K2]

CO 2: Compare and Contrast various Top-Down and Bottom-Up Parsing techniques. [K2]

CO 3: Interpret different types of Intermediate Code representations. [K2]

CO 4: Illustrate the effective usage of register allocation and various Code-generation techniques.[K2]

CO 5: Apply different code-optimization techniques to optimize the target code. .[K3]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1. Summarize different phases and passes of a compiler.(K2)		**Unit-1. OVERVIEW OF LANGUAGE PROCESSING**			
		1.1	Overview of Language Processing: Pre-processor, compiler	T1, T2, R1	2	Chalk & Talk
		1.2	Assembler, interpreter, linker & loader	T1, T2, R1	1	Chalk & Talk
		1.3	Phases of a compiler	T1, T2, R1	2	Chalk & Talk
		1.4	Lexical Analysis: Role of the lexical analysis, lexical analysis vs. parsing	T1, T2, R2	2	Chalk & Talk
		1.5	token, patterns and lexemes, lexical errors	T1, T2	2	Chalk & Talk
		1.6	Regular expressions: Regular definitions for the language constructs, strings, sequences	T1, T2, R1	2	PPT
		1.7	Transition diagram for recognition of tokens	T1, T2	1	Chalk & Talk
		1.8	Reserved words and identifiers with examples	T1, T2	1	Chalk & Talk
ASSIGNMENT I EXAMINATION						
2	CO2. Apply various Top-Down and Bottom-Up Parsing techniques. (K3)		**Unit-2. SYNTAX ANALYSIS**			
		2.1	Syntax Analysis, discussion on CFG, LMD,RMD, parse trees	T1, T2, R2	2	Chalk & Talk
		2.2	Role of a parser, Classification of parsing techniques	T1, T2, R2	2	PPT
		2.3	Brute force approach left recursion, left factoring	T1, T2, R2	2	Chalk & Talk
		2.4	Top down parsing, First and Follow- LL(1) Grammars	T1, T2, R3	2	Tutorial

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5	CO 5. Summarize different code-optimization techniques. (K2)	**Unit 5. CODE OPTIMIZATION**				
		5.1	Code generation: Issues, target machine	T1, T2, R4	1	Chalk & Talk
		5.2	Basic blocks & flow graphs	T1, T2, R4	1	Chalk & Talk
		5.3	Simple code generator	T1, T2, R4	1	Chalk & Talk
		5.4	Peephole optimization	T1, T2, R4	1	Chalk & Talk
		5.5	Machine independent code optimization- semantic preserving transformations	T1, T2, R4	1	Chalk & Talk
		5.6	Global common sub expression elimination, copy propagation	T1, T2, R4	1	Seminars
		5.7	Dead code elimination, constant folding, strength reduction	T1, T2, R4	1	Chalk & Talk
		5.8	Loop optimization	T1, T2, R4	1	Chalk & Talk
		5.9	Instruction scheduling	T1, T2, R4	1	PPT
		5.10	Inter procedural optimization	T1, T2, R4	1	Chalk & Talk
		Total				60
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

T1 Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, "Compilers – Principles, Techniques & Tools", Pearson, Second edition, 2007.

T2 K. Muneeswaran, "Compiler Design", Oxford University Press, 2013.

Reference Books:

R1 Keith D. Cooper, & Linda Torczon, "Engineering a Compiler", Morgan Kaufman publications, Second edition, 2011.

R2 V. Raghavan, "Principles of Compiler Design", TMH, Second edition, 2011.

R3 . Kenneth C. Louden, "Compiler Construction - Principles and Practice", Cengage Learning publications, First edition,1997.

R4 Yunlin Su, Song Y. Yan, "Implementations of Compiler - A new approach to Compilers including the Algebraic Methods", Springer publications, 2011.

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		2.5	Non- Recursive predictive parsing	T1, T2, R3	2	Student Seminar
		2.6	Error recovery in predictive parsing	T1, T2, R3	1	Chalk & Talk
		Unit-3. TYPES OF BOTTOM-UP APPROACHES				
3	CO 2. Apply various Top-Down and Bottom-Up Parsing techniques .(K3)	3.1	Bottom up parsing approach, Types, Introduction to simple LR, Why LR Parsers, Model of an LR Parsers	T1, T2, R1	2	Chalk & Talk
		3.2	Operator Precedence	T1, T2, R1	2	Chalk & Talk
		3.3	Shift Reduce Parsing, Difference between LR and LL Parsers	T1, T2, R1	2	Chalk & Talk
		MID I EXAMINATION				
3	CO 2. Apply various Top-Down and Bottom-Up Parsing techniques .(K3)	3.4	Construction of SLR Tables, More powerful LR parsers	T1, T2, R1	2	Chalk & Talk
		3.5	construction of CLR (1)	T1, T2, R1	2	Tutorial
		3.6	LALR Parsing tables	T1, T2, R1	2	Chalk & Talk
		3.7	Dangling ELSE Ambiguity, Error recovery in LR Parsing	T1, T2, R1	2	PPT
		3.8	Comparison of all bottoms up approaches with all top down approaches	T1, T2, R1	1	Web Resource
		Unit-4. SEMANTIC ANALYSIS				
4	CO 3. Interpret different types of semantic rules and Intermediate Code representations.(K2)	4.1	Semantic analysis, SDT, evaluation of semantic rules	T1, T2, R3	1	Chalk & Talk
		4.2	Intermediate code, three address code, Quadruples, Triples	T1, T2, R3	1	Chalk & Talk
		4.3	abstract syntax trees	T1, T2, R3	1	Chalk & Talk,
		4.4	Types and declarations and Type Checking	T1, T2, R3	2	Chalk & Talk
	CO 4. Illustrate the effective usage of register allocation and various Code-generation techniques.(K2)	4.5	Symbol Tables, use and need of symbol tables	T1, T2, R3	1	Chalk & Talk
		4.6	Runtime Environment: storage organization	T1, T2, R3	1	PPT
		4.7	stack allocation, access to non-local data,	T1, T2, R3	2	Seminars
		4.8	Heap management	T1, T2, R3	2	Chalk & Talk
		ASSIGNMENT II EXAMINATION				

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC31MC02	EITK (R20)	III/I	CSE	2	A,B,C&D

COURSE OUTCOMES:

After successful completion of the course students will be able to

- Interpret the philosophy of Indian Culture [K2].
- Interpret the Indian languages, Epics Ramayana and Mahabharata [K2].
- Analyze the information about Indian arts and architecture [K4].
- Analyze the spread of cultural exchange in abroad [K4].
- Analyze the contributions of scientists in different eras [K4].

No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			Unit-1. Indian Culture: An Introduction			
	CO1: Interpret the philosophy of Indian Culture [K2].	1.1	Characteristics, Significance and Geography of Indian culture	T1, R1	3	Chalk & Talk
		1.2	Society in India through ages- Ancient period	T1, R1	1	Chalk & Talk
		1.3	Varna and jati, family and marriage in India	T1, R1	1	Chalk & Talk
		1.4	Position of women in ancient India	T1,R1	1	Chalk & Talk
		1.5	Contemporary period; caste system and communalism	T1,R1	1	Chalk & Talk
			Unit-2. Indian Languages and Literature			
	CO2: Interpret the Indian languages, Epics Ramayana and Mahabharata [K2].	2.1	Evolution of script and languages in India: Harappan Script and Brahmi Script	T1, R1	1	Chalk & Talk
		2.2	Short History of the Sanskrit literature: The Vedas, The Brahmanas	T1, R1	1	Chalk & Talk
		2.3	Short History of the Sanskrit literature: Upanishads & Sutras	T1, R1	1	Chalk & Talk
		2.4	Epics: Ramayana	T1, R1	1	Chalk & Talk
		2.5	Epics: Mahabharata	T1, R1	1	Chalk & Talk
			Unit-3. Indian Arts and Architecture			
	CO3: Analyze the information about Indian arts and architecture [K4].	3.1	Indian Art & Architecture: Hindu Temple Architecture	T1, R1	1	Chalk & Talk
		3.2	Indian Art & Architecture: Buddhist Architecture	T1, R1		Chalk &
		3.3	Indian Art & Architecture: Medieval Architecture	T1, R1		Chalk & Talk

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		MID I EXAMINATION				
		3.4	Rise of modern theatre	T1, R1	1	Chalk & Talk
		3.5	Rise of Indian cinema	T1, R1	1	Chalk & Talk
		Unit-4. Spread of Indian Culture Abroad				
	CO4: Analyze the spread of cultural exchange in abroad [K4].	4.1	Causes, Significance and Modes of Cultural Exchange	T2, R2	3	Chalk & Talk
		4.2	Through Traders, Teachers, Emissaries, Missionaries and Gypsies	T2, R2	1	Chalk & Talk
		4.3	India, Central Asia through ages	T2, R2	1	Chalk & Talk
		4.4	India, Western World through ages	T2, R2	1	Chalk & Talk
	CO5: Analyze thecontributions of scientists in different eras [K4].	Unit 5. Education System in India				
		5.1	Education in ancient, medieval and modern India	T2, R2	1	Chalk & Talk
		5.2	aims of education, Science of ancient India	T2, R2	1	Chalk & Talk
		5.3	aims of education, Science of Modern India	T2, R2	1	Chalk & Talk
		5.4	Scientists of ancient India,	T2, R2	1	Chalk & Talk
		5.5	Scientists of Modern India	T2, R2	1	Chalk & Talk
				Total	28	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Suggested Readings:

1) Kapil Kapoor, "Text and Interpretation: The indian tradition" ISBN: 81246033375, 2005
2) " Science in Samskrit", Samskrita Bharti Publisher , ISBN 13 : 978- 8187276333,2007
3) NCERT , "Position Paper On Arts ,Music, Dance Theatre", ISBN 81-7450 494-X,200

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Year /Sem	Branch	Contact Periods/ Week	Sections
R20CC3204	Machine Learning (R20)	III/II	CSE	5	A,B,C &D

LESSON PLAN

COURSE OUTCOMES: After the successful completion of this course, the students will be able to:

CO1: Summarize the characteristics of Machine learning that make it useful to real-world Problems. **[K2]**

CO2: Evaluate and compare the performance of different supervised algorithms for typical Learning problems and apply them. [K5]

CO3: Outline the need for and importance of pre-processing techniques and apply them [K3]

CO4: Analyze the performance of Association Rules [K4]

CO5: Evaluate and compare the performance of different unsupervised algorithms for typical Learning problems and apply them [K5]

Unit No	Course Outcome	Topics/Activity	Ref Textbook	Total Periods	Delivery Method
Unit I: Supervised Learning					
1	CO 1: Summarize the characteristics of Machine Learning that make it useful to real-world Problems.[K2]	Introduction to Supervised Learning	T1	1	Chalk & Talk
		Learning a Class from Examples	T1	1	Chalk & Talk
		Vapnik Chervonenkis (VC) Dimension	T1 &T3	1	Chalk & Talk
		Probably Approximately Correct (PAC)	T1&T3	1	Chalk & Talk
		Noise and Learning Multiple Classes	T1	1	Chalk & Talk
		Regression: Simple and Multiple Linear	T1	1	Chalk & Talk
		Model Selection and Generalization	T1	1	Chalk & Talk
		Dimensions of a Supervised Machine Learning Algorithm	T1	1	Chalk & Talk
Unit II: Parametric Methods					
2	CO2: Evaluate and compare the performance of different supervised algorithms for typical learning problems and	Introduction to Parametric Methods	T1	1	Chalk & Talk
		Maximum Likelihood Estimation (Bernoulli, Multinomial, Gaussian)	T1	2	Chalk & Talk
		Evaluating an Estimator	T1	1	Chalk & Talk
		The Bayes' Estimator	T1	1	Chalk & Talk
		Parametric Classification	T1	1	Chalk & Talk
		Regression Analysis	T1	1	Chalk & Talk

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	apply them.[K5]	Tuning Model Complexity: Bias/Variance Dilemma	T1	1	Chalk & Talk
		Model Selection Procedures	T1	1	Chalk & Talk
Unit III: Dimensionality Reduction					
3	CO3: Outline the need for and importance of pre-processing techniques and apply them[K3]	Introduction to Dimensionality Reduction	T1	1	Chalk & Talk
		Subset Selection	T1	1	Chalk & Talk
		Principal Components Analysis	T1	2	Chalk & Talk
		Factor Analysis	T1	1	Chalk & Talk
		Linear Discriminant Analysis	T1	1	Chalk & Talk
	CO4: Analyze the performance of Association Rules[K4]	Association Learning Basics	T1	1	Chalk & Talk
		Apriori Algorithm with Examples	T1	2	Chalk & Talk
		FP Growth Algorithm with Examples	T1	2	Chalk & Talk
Unit IV: Unsupervised Learning and Clustering					
4	CO5: Evaluate and compare the performance of different unsupervised algorithms for typical learning problems and apply them[K5]	Introduction to Unsupervised Learning	T1	1	Chalk & Talk
		Expectation Maximization Algorithm	T1	2	Chalk & Talk
		Self-Organizing Maps (SOM): Learning Process and Algorithm	T1&T3	1	PPT
		Adaptive Resonance Theory	T1	1	Chalk & Talk
		k-Means Clustering	T1&T3	2	PPT
		Expectation Maximization Algorithm in Clustering	T1&T3	2	Chalk & Talk
		Hierarchical Clustering and Choosing Number of Clusters	T1&T3	1	Chalk & Talk
		Supervised Learning after Clustering	T1	1	Chalk & Talk
		Spectral Clustering	T1	1	Chalk & Talk
		Document Clustering and Applications	T1	1	Chalk & Talk
Unit V: Decision Trees and Random Forest					
	CO5: Evaluate and compare the performance of different unsupervised algorithms for typical learning problems and apply them[K5]	Univariate Trees: Classification and Regression Trees	T1	1	PPT
		Pruning and Rule Extraction	T1&T3	1	Chalk & Talk
		Problems on Decision Trees	T1&T3	2	Chalk & Talk
		Random Forest Principles	T1&T3	1	Chalk & Talk
		Random Forest Algorithm with Examples	T1&T3	1	PPT
		Decision Tree vs Random Forest	T1&T3	1	Chalk & Talk
Total Number of Hours				48	

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Other Teaching Activities:

S.No	Topic/Activity	Term Work Component	Planned Hours
1	Evaluation Metrics for Supervised Learning	Seminars	1
2			1
3	Regularization Techniques		1
4			1
5	PCA for Visualization		1
6	Problems on Apriori and FP Growth		1
7	Problems on Expectation Maximization Algorithm		1
8	Problems on EM and SOM		1
9	Problems Clustering		1
10	Problems on Decision Trees		1
11	Supervisedlearning	Mini Project	10
12	Unsupervised learning		
13	Slip Tests	Slip Tests	10
14	Certification on Scikit-learn	MyGreat Learning Certification (https://olympus.mygreatlearning.com/courses/62481)	7
15	Certification on Introduction to TensorFlow and Kera's	MyGreat Learning Certification (https://olympus.mygreatlearning.com/courses/31734)	7
Total Number of Hours			42

TEXTBOOKS:

1. Ethem Alpaydin, "Introduction to Machine Learning", The MIT Press

2. Artificial Intelligence and Machine Learning, by Vinod Chandra PHI Learning.

3. Tom M. Mitchell "Machine Learning", MC Graw Hill

4. Aurélien Géron, "Handson machine learning with scikit learn and TensorFlow" O'REILLY

WEB RESOURCES

1. https://onlinecourses.nptel.ac.in/noc24_cs81/preview

2. https://www.youtube.com/@MaheshHuddar/playlists

3. **https://www.tutorialtpoint.net/p/machine-learning-tutorial.html**

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN A:Y:2024:2025

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R20CC3205	Advanced Java & Web Technologies (R20)	III/II	CSE	5	A ,B,C &D

LESSON PLAN

COURSE OUTCOMES: After the successful completion of this course, the students will be able to:

CO1 : Interpret Servlet Life Cycle and web servers. [K2]

CO2 : Illustrate JSP Life cycle. [K2]

CO3: Apply Session Management for JSP applications. [K3]

CO4: Analyze the usage of JDBC in JSP applications. [K3]

CO5: Analyze the web based applications in PHP. [K3]

CO 6: Utilize JDBC in PHP web-based applications. [K3]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1. Interpret Servlet Life Cycle and web servers. [K2].		**Unit-1**			
		1.1	Web Servers and Servlets: Tomcat web server, Introducing java Servlet.	T1	1	Chalk & Talk
		1.2	Introducing the servlet API.	T1	2	Chalk & Talk
		1.3	Lifecycle of a Servlet, Working with Initialization Parameters.	T1	2	Chalk & Talk
		1.4	Describing the HttpServlet Request & HttpServlet Response interfaces.	T1	2	Chalk & Talk
		1.5	Cookies.	T1	2	Chalk & Talk
		1.6	Session Tracking, Security Issues.	T1	2	Chalk & Talk
2	CO2. Illustrate JSP Life cycle. [K2].		**Unit-2**			
		2.1	Introduction to JSP: The Problem with Servlet. The Anatomy of a JSP Page.	T1	2	Chalk & Talk
		2.2	JSP Processing. JSP Application Design with MVC.	T1	2	Chalk & Talk
		2.3	Generating Dynamic Content: directive elements, what is template text, action elements, Using Scripting Elements.	T1	4	Chalk & Talk
		2.4	Conditional Processing: Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods.	T1	2	Chalk & Talk
3			**Unit-3**			

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	CO 3. Apply Session Management for JSP applications. **[K3].**	3.1	Error Handling and Debugging, Implicit JSP Objects	T1	3	Chalk & Talk
		3.2	Sharing Data between JSP pages, Requests, and Users	T1	2	Chalk & Talk
		3.3	Passing the data between JSP pages using session object,	T1	2	Chalk & Talk
4	CO 4. Analyze the usage of JDBC in JSP applications. **[K3].**	**Unit-4**				
		4.1	Introduction, Database Programming Using JDBC: How JDBC Works.	T1	2	Chalk & Talk
		4.2	JDBC Architecture, JDBC Driver Types, Studying javax.sql.*package.	T1	1	Chalk & Talk
		4.3	Accessing Database From JSP page: Use of Prepared Statement, ResultSet.	T1	4	Chalk & Talk
5	CO 5. Make use of PHP for the development of web-based applications **[K3].** CO 6. Utilize JDBC in PHP web-based applications.. **[K3].**	**Unit-5 Part-I**				
		5.1	Introduction to PHP, Creating PHP script, Running PHP script.	T2	1	Chalk & Talk
		5.2	Working with variables and constants, Data types, Operators.	T2	2	Chalk & Talk
		5.3	Controlling program flow, Working with Arrays, Built-in functions in PHP.	T2	2	Chalk & Talk
		5.4	User-defined functions in PHP, recursive, variable, and callback functions.	T2	2	Chalk & Talk
		5.5	Database programming	T2	2	Chalk & Talk
		5.6	Working with forms	T2	2	Chalk & Talk
		5.7	Working with Databases such as MySQL, Oracle, SQL Server	T2	2	Chalk & Talk
				Total	48	

Activity Plan for Term Work:

S.No	Topic/Activity	Term Work Component	Planned Hours
1.	1.Cookies, 2.JSP Processing. JSP Application Design with MVC, Passing the data between JSP pages using session object, Memory Usage 3.Considerations, JDBC Architecture, JDBC Driver Types, Studying javax.sql.*package. 4.Introduction to PHP, Creating PHP script, Running PHP script, 5. Working with variables and constants, Data types, Operators.	Seminar	5
2.	1. Implicit JSP Objects, 2. validating a form	Collaborative Learning/ Virtual Labs/ Active Learning or Any other learning Activity	5

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3.	1.Passing Control and Data between Pages: passing the control between the pages, passing the data between JSP pages 2, Memory Usage Considerations.	Flipped Learning	5
4.	Deploy a Dynamic Web application	Micro Project	12
5.	Slip test	Slip test	5
6	PHP for beginers	Online learning platforms **(MOOCs (Massive Open Online Courses), NPTEL, and Infosys Springboard)/ Any other online learning activity.**	10
			Total No. of Hours : 42

Text Books:	
T1	Web technologies –A.A. Puntambekar , Technical Publications, Pune.
T2	WebTechnologies-Black Book , Kognent Learning Solutions Inc Sol. DreamtTech Press
Reference Books:	
R1	An Introduction to Web Design and Programming –Wang Thomson
R2	An Introduction to Web Design + Prgramming Wang, Katila CENGAGE.
R3	Web Technologies A Developer's Perspective, N.P.Gopalan , Akhilandeswari, PHI.
Web Resources:	
1	https://www.javatpoint.com/jsp-tutorial
2	https://www.php.net/

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN

Academic Year: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods /Week	Sections
R20CC3201	CRYPTOGRAPHY & NETWORK SECURITY (R20)	VI (III-II)	COMPUTER SCIENCE AND ENGINEERING	5	A,B,C,D

COURSE OUTCOMES : Students are able to

CO1 : Summarize the fundamentals of Cryptography. [K2]

CO2 : Analyzehow security is achieved, and attacks can be countered by using symmetric/asymmetric algorithms. [K4]

CO3 : Apply Number Theoretic concepts in developing cryptographic algorithms to counter attacks. [K3]

CO4 : Interpret the role of hash functions and Digital Signatures in Information Security.[K2]

CO5 : Compare different network security designs using available secure solutions. [k2]

CO6 : Illustrate the use of encryption techniques to secure data in transit across data networks. [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1:Summarize** the fundamentals of Cryptography. [K2]		**Unit-1: Introduction**			
		1.1	Security attacks, services and mechanisms	T1, T2, R1	2	Chalk & Talk
		1.2	A Model for network security	T1, T2, R1	2	PPT
		1.3	Substitution Techniques	T1, T2, R1	2	Chalk & Talk, PPT
		1.4	Transposition Techniques	T1, T2, R1	1	Chalk & Talk
		1.5	Block Cipher and Stream Cipher	T1	1	Chalk & Talk
2	**CO2:Analyze** how security is achieved, and attacks can be		**Unit-2: Symmetric Key Cryptography**			
		2.1	Feistel Cipher Structure	T1, T2, R2	2	Chalk & Talk
		2.2	Block cipher Design principles	T1, T2, R2	1	PPT,

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	countered by using symmetric/asymmetric algorithms. [K4]	2.3	Data Encryption Standard (DES), Strength of DES	T1, T2, R2	1	Chalk Talk, PPT
		2.4	International Data Encryption Algorithm (IDEA)	T1, T2, R2	1	Chalk & Talk, PPT
		2.5	AES Structure, Transformation functions, Key Expansion	T1, T2, R1	2	Chalk & Talk, PPT
		2.6	Block cipher modes of operation	T1, T2, R1	1	Chalk & Talk, PPT,
3	**CO2:Analyze** how security is achieved, and attacks can be countered by using symmetric/asymmetric algorithms. [K4] **CO3:Apply** Number Theoretic concepts in developing cryptographic algorithms to counter attacks. [K3]	**Unit-3: Number Theory& Public Key Cryptography**				
		3.1	Prime and relatively Prime **numbers**	T1, T2, R1	1	Chalk & Talk,
		3.2	Modular Arithmetic	T1, T2, R1	1	Chalk & Talk, PPT,
		3.3	Fermat's and Euler's Theorems	T1, T2, R1	1	Chalk & Talk
		3.4	The Chinese Remainder Theorem	T1, T2, R1	1	Chalk & Talk
		3.5	Discrete Logarithms	T1, T2, R1	2	Chalk & Talk, PPT
		3.6	RSA Algorithm	T1, T2, R1	2	Chalk & Talk, PPT,
		3.7	Diffie - Hellman Key exchange algorithm	T1, T2, R1	2	Chalk & Talk, PPT,
		3.8	ElGamal Encryption and Decryption	T1, T2, R1	1	Chalk & Talk, PPT,
4	**C04 :Interpret** the role of hash functions and Digital Signatures in Information Security.[K2]	**Unit-4: Cryptographic Hash Functions and Digital Signatures**				
		4.1	Message Authentication Functions, requirements and Security	T1, T2, R2	2	Chalk & Talk, PPT,
		4.2	Applications of cryptographic Hash Functions, Requirements and Security	T1, T2, R2	1	Chalk & Talk, PPT,
		4.3	Secure Hash Algorithm	T1, T2, R2	2	PPT
		4.4	HMAC, CMAC	T1, T2, R2	2	Chalk & Talk
		4.5	Digital Signature Schemes,	T1	2	PPT
			Authentication Protocols	T1	1	Chalk & Talk
		4.6	Digital Signature Standard	T1	2	Chalk & Talk
5	**CO5:Compare** different network security designs using available secure solutions. [k2]	**Unit 5: Authentication Applications and Web Security**				
		5.1	Remote user authentication principles, Kerberos Version 4	T1, T2, R2	2	Chalk & Talk
		5.2	X.509 Directory Authentication service.	T1, T2, R1	2	PPT,
		5.3	E-Mail and File Transfer Security- PGP	T1, T2, R2	1	PPT

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	CO6:Illustrate the use of encryption techniques to secure data in transit across data networks. [K2]	5.4	E-Mail Security- S/MIME	T1, T2, R1	2	PPT
		5.5	Web Security Requirements	T1, T2, R1	1	Chalk & Talk
		5.6	Secure Socket Layer(SSL) and Transport Layer Security(TLS)	T1	1	PPT
		5.7	Secure Electronic Transactions (SET)	T1	1	Chalk & Talk
		5.8	Firewalls	T1	1	Chalk & Talk
Total					48	

S. NO	TOPIC/ACTIVITY	TERM WORK COMPONENT	PLANNED HOURS
1.	Block Cipher and Stream Cipher Feistel Cipher Structure Authentication Protocols Web SecurityRequirements Firewalls	Seminar	5
2.	RSA Algorithm .Diffie - Hellman Key exchange algorithm ElGamal Encryption and Decryption Message Authentication Functions, requirements and Security X.509 Directory Authentication service.	Collaborative Learning/ Active Learning or Any other learning Activity	5
3.	Principles of Public Key Cryptography International Data Encryption Algorithm (IDEA) Secure Hash Algorithm Digital Signature	Flipped Learning	5
4.	Algorithm implementaion	Mini Project	12

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	Sliptest	Sliptest	5
6	cryptography for beginers	Infosys Springboard/coursera / Any other online learning activity.	10
			Total No. of Hours : 42

TEXTBOOKS:

1. William Stallings, "Cryptography and Network Security: Principles and Practice", Pearson Education, 6th Edition, 2011.

2. Chwan Hwa Wu, J.David Irwin, "Introduction to Computer Networks & Cyber Security", CRC Press, 2013.

REFERENCE BOOKS:

1. Eric Maiwald, "Fundamentals of Network Security", Dreamtech press.
2. Withman , Thomson, "Principles of Information Security".
3. Buchmann, Springer, "Introduction to Cryptography".
4. Bruce Schneier, Johnwiley&Sons, "Applied Cryptography", 2nd Edition.
5. Benard Menezes, "Network Security Essentials and Cryptography", Cengage Learning,2011.
6. Behrouz A.Fourouzan and Debdeep Mukhopadhyay, "Cryptography and Network, 2nd Edition", McGraw- Hill, 2010.

WEB REFERENCES :

1. https://onlinecourses.nptel.ac.in/noc18_cs07/preview
2. https://www.coursera.org/learn/cryptography
3. https://www.coursera.org/specializations/computer-network-security
4. https://www.youtube.com/watch?v=Q-HugPvA7GQ&list=PL71FE85723FD414D7

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN
A:Y:2024:2025

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R20CC3205	BIG DATA ANALYTICS (R20)	III/II	CSE	5	A ,B,C &D

LESSON PLAN

COURSE OUTCOMES: After the successful completion of this course, the students will be able to:

CO 1: Interpret the architectural elements of big data and Hadoop framework. [K2]
CO 2: Analyse various big data applications using map reduce programming module. [K4]
CO 3: Analyse Spark capabilities such as distributed datasets, in-memory caching, and the interactive shell. [K4]
CO 4: Analyze Hadoop data with PIG and Hive. Interpret the applications and architecture of Mobile Computing and multiplexing techniques. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			Unit-1			
1	**CO 1:** Interpret the architectural elements of big data and Hadoop framework.**[K2]**	1.1	Google File System.	T1, T3	2	Chalk & Talk + PPT
		1.2	Hadoop Distributed File System (HDFS) – Building blocks of Hadoop. (Namenode, Datanode, Secondary Namenode, JobTracker, TaskTracker).	T1, T3	2	Chalk & Talk
		1.3	Introducing and Configuring Hadoop cluster - Local mode.	T1, T3	2	Chalk & Talk + PPT
		1.4	Introducing and Configuring Hadoop cluster - Pseudo-distributed mode - Configuring XML files.	T1, T3	2	Chalk & Talk + PPT
		1.5	Introducing and Configuring Hadoop cluster - Fully Distributed mode - Configuring XML files.	T1, T3	2	Chalk & Talk + PPT
			Unit-2			
2	**CO2:** Analyze various big data applications using map reduce programming module. **[K4]**	2.1	Understanding Hadoop API for MapReduce Framework - Old.	T1, T3	2	Chalk & Talk + PPT
		2.2	Understanding Hadoop API for MapReduce Framework - New.	T1, T3	2	Chalk & Talk + PPT
		2.3	Basic programs of Hadoop MapReduce: Driver code, Mapper code, Reducer code, RecordReader, Combiner, Partitioner.	T1, T3	4	Chalk & Talk + PPT
		2.4	MapReduce Program for Weather Dataset.	T1, T3	2	Chalk & Talk + PPT
			Unit-3			

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3	**CO 3:** Analyze Spark capabilities such as distributed datasets, in-memory caching, and the interactive shell. **[K4]**	3.1	What Is Apache Spark, RDD Basics	T2	2	Chalk Talk
		3.2	Creating RDDs	T2	1	PPT
		3.3	RDD Operations, Common Transformations, and Actions	T2	3	Chalk & Talk
		3.4	Passing Functions to Spark	T2	1	Chalk & Talk
		3.5	Common Transformations and Actions, Persistence	T2	2	Chalk & Talk
Unit-4						
4	**CO 4:** Analyze Hadoop data with PIG and Hive. **[K4]**	4.1	Admiring the Pig Architecture, Going with the Pig Latin Application Flow.	T4	2	Chalk & Talk + PPT
		4.2	Working through the ABCs of Pig Latin: Data types, syntax, and script execution	T4	3	Chalk & Talk
		4.3	Evaluating Local and distributed Mode of Running Pig Scripts.	T4	2	Chalk & Talk + PPT
		4.4	Checking out the Pig Script Interfaces, Scripting with Pig Latin.	T4	1	Chalk & Talk
Unit-5						
5	**CO 4:** Analyze Hadoop data with PIG and Hive. **[K4]**	5.1	Saying Hello to Hive, Seeing How the Hive is Put Together.	T4	1	Chalk & Talk
		5.2	Getting Started with Apache Hive, Examining the Hive Clients.	T4	2	Chalk & Talk + PPT
		5.3	Working with Hive Data Types.	T4	3	Chalk & Talk
		5.4	Creating and Managing Databases and Tables ,Seeing How the Hive Data Manipulation Language Works.	T4	2	PPT
		5.5	Querying and Analyzing Data.	T4	3	PPT
				Total	48	

Activity Plan for Term Work:

S.No	Topic/Activity	Term Work Component	Planned Hours
1	1. Differences between GFS and HDFS 2. Set up and execute a Hadoop cluster in • standalone mode • Pseudo distributed mode • Fully distributed mode	Seminar, Hands-On	9
2	MapReduce programs for data transformation using Hadoop • Word Count • Weather Forecasting	Collaborative Learning, Hands-On or Any other learning Activity	8
3	MapReduce programs for data transformation using Spark	Project based learning, Collaborative Learning, Hands-On with Apache Spark or Any	4

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	• Word Count • Weather Forecasting	other learning Activity	
4	Execute Pig and Hive scripts for structured and semi-structured data analysis	Hands-On with pig and Hive	6
5	Sliest	Sliptest	5
6	Exploring online tutorials and courses on Hadoop, Spark, pig and Hive (Self Learning)	Online learning platforms **(MOOCs (Massive Open Online Courses), Edureka, Coursera** and **Infosys Springboard / Any other online learning activity.**	10
			Total No. of Hours : 42

Text Books:	
T1	Hadoop: The Definitive Guide by Tom White, 3rd Edition, O'reilly
T2	Learning Spark by MateiZaharia, Holden Karau, Andi Konwinski, Patric Wendell, O'Reilly Media,2015.
T3	Hadoop in Action by Chuck Lam, MANNING Publ.
T4	Hadoop for Dummies by Dirk deRoos, Paul C.Zikopoulos, Roman B.Melnyk,Bruce Brown, Rafael Coss
Reference Books:	
R1	Hadoop in Practice by Alex Holmes, MANNING Publ.
R2	Hadoop MapReduce Cookbook,SrinathPerera, Thilina Gunarathne
Web Resources:	
1	https://hadoop.apache.org/docs/current/hadoop-project-dist/hadoop-common/ClusterSetup.html
2	https://spark.apache.org/docs/latest/rdd-programming-guide.html
3	https://pig.apache.org/docs/r0.17.0/start.html
4	https://cwiki.apache.org/confluence/display/Hive/Home

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NARASARAOPETA ENGINEERING COLLEGE
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC32OE16	**CLOUD COMPUTING**	6	CSE	5	A,B,C,D

COURSE OBJECTIVES:

- To gain knowledge about virtualization and Virtual Machines
- To familiarize Cloud Computing and its services

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO1: Interpret various types of Virtualizations. [K2]
CO2: Outline the Cloud Computing Architectures and Models. [K2]
CO3: Analyze the Cloud Infrastructure Management and Migration and Disaster Management in Cloud. [K4]
CO4: Analyze AWS and MS Azure services. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1:** Interpret various types of Virtualizations. [K2].	**Unit-1.** Overview of Cloud Computing:				
		1.1	Essentials of Cloud Computing,	T1	1	Chalk & Talk, PPT
		1.2	History of Cloud Computing, Business and IT perspective	T1	2	
		1.3	Limitations of Cloud Computing	T1	2	
		1.4	Characteristics of Cloud Computing,	T1	1	
		1.5	How to Develop Cloud Infrastructure	T1	1	
		1.6	Vendors of Cloud Computing	T1	1	
2	**CO1:** Interpret various types of Virtualizations. [K2] **CO2**: Outline the Cloud Computing Architectures and Models. [K2]	**Unit-2.:** Introduction to virtualization and virtual machine:				
		2.1	Types of virtualizations: Server virtualization, Application/ desktop virtualization,	T1	2	Chalk & Talk, PPT
		2.2	client virtualization, storage virtualization, Network virtualization service / application infrastructure virtualization,	T1	1	
		2.3	virtual machines & virtualization middleware.	T1	2	
		2.4	Cloud Computing Architecture: Grid Framework Overview, Grid Architecture, Cloud Computing Architecture,	T1	2	
		2.5	Key Design Aspects of Cloud Architecture, Cloud Services, and Cloud Applications,	T1	2	
		2.6	Similarities and Differences Between Grid and Cloud Computing, Cloud and Dynamic Infrastructure.	T1	2	

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3	CO2: Outline the Cloud Computing Architectures and Models. [K2]	**Unit-3.** Models of Cloud Computing:					
		3.1	Cloud Service Models,	T1	2	Chalk Talk, PPT	
		3.2	Cloud Computing Sub Service Models,	T1	2		
		3.3	Cloud Deployment Models,	T1	2		
		3.4	Alternative Deployment Models,	T1	2		
		3.5	Cloud Stack,	T1	2		
		3.6	Cloud Storage.	T1	2		
4	**CO3:** Analyze the Cloud Infrastructure Management and Migration and Disaster Management in Cloud. [K4]	**UNIT-IV** Cloud Infrastructure Management and Migration, Disaster Recovery:					
		4.1	Administrating Clouds, Cloud Management Products,	T1	2	Chalk & Talk, PPT	
		4.2	Processes in Cloud Service Management, Cloud Providers and Traditional IT Service Providers,	T1	1		
		4.3	How to Access the Cloud, Migrating to Clouds.	T1	2		
		4.4	Disaster Recovery Planning	T1	1		
		4.5	Disasters in the Cloud	T1	1		
		4.6	Disaster Management	T1	1		
5	**CO4:** Analyze AWS and MS Azure services. [K4]	**Unit 5.: Microsoft Azure, AWS**					
		5.1	What is Microsoft Azure?, Types of Azure Clouds, Azure key Concepts,	T1	1	Chalk & Talk, PPT	
		5.2	Azure Domains (Components), Traditional vs. Azure Cloud Model,	T1	1		
		5.3	Applications of Azure, Advantages of Azure, Disadvantages of Azure.	T1	1		
		5.4	What is AWS?, History of AWS, Important AWS Services	T1	1		
		5.5	Amazon Web Services Cloud Platform: Compute & Networking	T1	1		
		5.6	Storage & Content Delivery Network, Database, Analytics, Application Services	T1	1		
		5.7	Deployment and Management, Applications of AWS ,services, Companies using AWS	T1	1		
		5.8	Advantages of AWS, Disadvantages of AWS	T1	1		
		5.9	Comparison between Azure and AWS	T1	1		
					Total Hours:48		

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Activity Plan for Term Work:

S.No	Topic/Activity	Term Work Component	Hours
1.	Benefits of Cloud Computing, Features of cloud computing,	Colabarative learning	5
2	Fundamentals of AWS and Azure	student Seminars	10
3	Every Unit	Sliptest	5
4	Cloud Applications	Flipped learning	7
5	cloud computing certifications	Online learning platforms **(MOOCs (Massive Open Online Courses), NPTEL, and Infosys Springboard)/ Any other online learning activity.**	15
			Total No. of Hours : 42

TEXT BOOKS:

T1. Cloud Computing –Shailendra Singh, Oxford University Press.

REFERENCE BOOKS:

R1. Cloud Computing and SOA Convergence in Your Enterprise: A Step-by-Step Guide David S. Linthicum Addison-Wesley Professional.

R2. Distributed & Cloud Computing From Parallel Processing to the Internet of Things by Kai Hwang. Geoffrey C. Fox. Jack J. Dongarra

ONLINE REFERENCES:

1. http://nptel.ac.in/courses/106106129/21
2. https://freevideolectures.com/course/3649/cloud-computing
3. https://www.youtube.com/ cloud-computing

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DEPARTMENT OF CSE
LESSON PLAN- A.Y 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC32MC01	PEHV (R20)	III/II	CSE	2	A,B,C,D

COURSE OUTCOMES: Student is able toHi bava tomaro i will come

CO1: Interpret the fundamentals of Human values. [K2]
CO2: Analyze the ethical issues and role of engineers in industry. [K4]
CO3: Develop the principles of harmony in value education. [K3]
CO4: List out the duties and rights of engineers. [K4]
CO5: Summarize the engineer's responsibilities towards safety and risk. [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Interpret the fundamentals of Human values. [K2]		**Unit-1. Human Values**			
		1.1	Ethics, Morals, Values, Integrity,	T1, R1	1	Chalk & Talk
		1.2	Work Ethics- Service Learning	T1, R1	1	Chalk & Talk
		1.3	Civic Virtue- Respect for Others- Living Peacefully	T1, R1	1	Chalk & Talk
		1.4	Caring- Sharing- Honesty- Courage- Value Time	T1,R1	1	Chalk & Talk
		1.5	Cooperation- Commitment – Empathy- Self-Confidence- Spirituality- Character.	T1,R1	1	Chalk & Talk
2	CO2: Analyze the ethical issues and role of engineers in industry. [K4]		**Unit-2. Engineering Ethics**			
		2.1	Professional Roles to Be Played By Engineer	T1, R1	1	Chalk & Talk
		2.2	Engineers Role As Managers,	T1, R1	1	Chalk & Talk
		2.3	Consultants And Leaders- Ethical Theories And Its Uses.	T1, R1	2	Chalk & Talk
3	CO3: Develop the principles of harmony in value education. [K3]		**Unit-3. Principles for Harmony**			
		3.1	Truthfulness – Customs and Traditions	T1, R1	1	Chalk & Talk
		3.2	Value Education – Human Dignity	T1, R1	1	Chalk & Talk
		3.3	Human Rights –Fundamental Duties	T1, R1	1	Chalk & Talk
		3.4	Aspirations and Harmony (I, We & Nature) – Gender Bias – Emotional Intelligence	T1, R1	1	Chalk & Talk
		3.5	Salovey – Mayer Model – Emotional Competencies – Conscientiousness.	T1, R1	2	Chalk & Talk
4	CO4: List out the duties and rights of engineers. [K4]		**Unit-4. Engineers' Duties and Rights**			
		4.1	Concept of Duty - Professional Duties – Collegiality	T2, R2	1	Chalk & Talk
		4.2	Techniques for Achieving Collegiality – Senses of Loyalty	T2, R2	1	Chalk & Talk
		4.3	Consensus and Controversy - Professional and Individual Rights	T2, R2	1	Chalk & Talk

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		4.4	Confidential and Proprietary Information - Conflict of Interest-Ethical egoism	T2, R2	1	Chalk & Talk
		4.5	Collective Bargaining – Confidentiality - Gifts and Bribes	T2, R2	1	Chalk & Talk
		4.6	Problem solving-Occupational Crimes	T2, R2	1	Chalk & Talk
		4.7	Industrial Espionage- Price Fixing-Whistle Blowing	T2, R2	1	Chalk & Talk
5	CO5: Summarise the engineer's responsibilities towards safety and risk. [K2].	**Unit 5. Engineers' Responsibilities towards Safety and Risk**				
		5.1	Concept of Safety - Safety and Risk	T2, R2	1	Chalk & Talk
		5.2	Types of Risks – Voluntary v/s Involuntary Risk	T2, R2	1	Chalk & Talk
		5.3	Consequences - Risk Assessment – Accountability	T2, R2	1	Chalk & Talk
		5.4	Liability - Reversible Effects	T2, R2	1	Chalk & Talk
		5.5	Threshold Levels of Risk - Delayed v/s Immediate Risk	T2, R2	1	Chalk & Talk
		5.6	Safety and the Engineer	T2, R2	1	Chalk & Talk
		5.7	Designing for Safety – Risk-Benefit Analysis-Accidents.	T2, R2	1	Chalk & Talk
				Total	30	

Text Books:

T1 "Professional Ethics and Morals by Prof. A.R.Arasri, Dharanikota Suyodhana- Maruthi Publication

T2 Human Values & Professional Ethics by S. B. Gogate, Vikas Publishing House Pvt. Ltd., Noida.

Reference Books:

R1 "Engineering Ethics and Human Values" by M. Govindarajan, S. Natarajan and V.S. Senthil kumar PHI Learning PVT. Ltd-2009

R2 Professional Ethics by R. Subramanian – Oxford Publications, New Delhi.

Web Resources:

https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://uhv.org.in/uhve&ved=2ahUKEwjhoo7Y-IiKAxV-SWwGHVFbHTsQFnoECBUQAQ&usg=AOvVaw0ohemfuDU4LIqP-TMxdp4

https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://aits-tpt.edu.in/wp-content/uploads/2023/08/Human-values-and-professional-ethics-min.pdf&ved=2ahUKEwjhoo7Y-IiKAxV-SWwGHVFbHTsQFnoECBsQAQ&usg=AOvVaw2JfWhfyC2N1AGDHZczivQ3

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Department of Computer Science and Engineering

Lesson Plan 2024 -25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/ Week	Sections
R20CC4102	**HUMAN COMPUTER INTERACTION**	VII	Computer Science and Engineering	6	A,B,C & D

COURSE OBJECTIVES: The main objective is to get student to think constructively and analytically about how to design and evaluate interactive technologies.

COURSE OUTCOMES:

CO 1: Outline knowledge about user interface design. [K2]
CO 2: Summarize the importance of Graphical User Interface. [K2]
CO 3: Apply the strategies used in design process. [K3]
CO 4: Summarize the importance of screen designing. [K2]
CO 5: Apply the various operations of Windows. [K3]

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
1	CO 1: Outline knowledge about user interface design.	**Unit-1: Introduction**				
		1.1	Importance of user Interface- definition	T1, T2, R1	2	Chalk, Talk & PPT
		1.2	importance of good design	T1, T2, R1	2	Chalk, Talk & PPT
		1.3	Benefits of good design	T1, T2, R1	2	Chalk, Talk & PPT
		1.4	A brief history of Screen design.	T1, T2, R1	2	Chalk, Talk & PPT
2	CO 2: Summarize the importance of Graphical User Interface.	**Unit-2: The graphical user interface**				
		2.1	popularity of graphics	T1, T2, R2	2	Chalk, Talk & PPT

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		2.2	the concept of direct manipulation	T1, T2, R2	2	Chalk, Talk & PPT
		2.3	graphical system, Characteristics	T1, T2, R2	2	Chalk, Talk & PPT
		2.4	Web user – Interface popularity	T1, T2, R2	2	Chalk, Talk & PPT
		2.5	Characteristics- Principles of user interface.	T1	2	Chalk, Talk & PPT
3	**CO 3: Apply** the Strategies used in design process. [K3]	**Unit-3: Design process**				
		3.1	Human interaction with computers	T1, T2, R1	2	Chalk, Talk & PPT
		3.2	importance of human characteristics	T1, T2, R1	2	Chalk, Talk & PPT
		3.3	human consideration	T1, T2, R1	2	Chalk, Talk & PPT
		3.4	Human interaction speeds	T1, T2, R1	2	Chalk, Talk & PPT
MID I EXAMINATION DURING EIGTH WEEK						
4	**CO 4: Summarize** the importance of screen designing	**Unit-4: Screen Designing**				
		4.1	Design goals – Screen planning and purpose	T1, T2, R2	2	Chalk, Talk & PPT
		4.2	organizing screen elements	T1, T2, R2	2	Chalk, Talk & PPT
		4.3	ordering of screen data and content – screen navigation and flow	T1, T2, R2	2	Chalk, Talk & PPT

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		4.4	Visually pleasing composition – amount of information	T1, T2, R2	2	Chalk, Talk & PPT
		4.5	focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics.	T1	2	Chalk, Talk & PPT
			Unit 5: Windows			
5	**CO 5: Apply** the various operations of Windows	5.1	New and Navigation schemes selection of window	T1, T2, R2	2	Chalk, Talk & PPT
		5.2	selection of devices based and screen based controls	T1, T2, R1	2	Chalk, Talk & PPT
		5.3	Components – text and messages, Icons and increases	T1, T2, R2	2	Chalk, Talk & PPT
		5.4	Multimedia, colors	T1, T2, R1	2	Chalk, Talk & PPT
		5.5	uses problems, choosing colors	T1, T2, R1	2	Chalk, Talk & PPT
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

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TEXT BOOKS	
T	BOOK TITLE/AUTHORS/PUBLISHER
T1	1. Alan Dix, Janet Finlay, Goryd, Abowd, Russell Beal, "Human Computer Interaction", PEA, 3/e, 2004
T2	2. Wilbert O Galitz, "The Essential guide to user interface design", Wiley Dream tech, 2/e

REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Dan R.Olsan, "Human Computer", Interaction Cengage ,2010.
R2	Ben Shneidermann , "Designing the user interface", 4/e, PEA.
R3	Soren Lauesen, "User Interface Design", PEA.
R4	Prece, Rogers, Sharps, "Interaction Design", Wiley

WEB RESOURCES	
1	https://en.wikipedia.org/wiki/Human+computer+interaction
2	https://www.interaction-design.org/literature/topics/human-computer-interaction
3	https://en.wikipedia.org/wiki/Human%E2%80%93computer_interaction
4	https://www.tutorialspoint.com/human_computer_interface/human_computer_interface_introduction.htm

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC4104	E-COMMERCE	VI	Computer science and engineering	6	4

COURSE OUTCOMES:

After completion of this course, the students would be able to

CO 1: Interpret the E-commerce applications and Process Model. [K2]

CO 2: Compare and contrast various electronic Payment Systems. [K3]

CO 3: Interpret the Intra Organizational Commerce. [K2]

CO 4: Outline the corporate digital library and marketing research. [K2]

CO 5: Analyze resource discovery and information filtering. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Interpret the E-commerce applications and Process Model. [K2].		**UNIT-I**			
		1.1	Electronic Commerce-Framework	T1	2	Chalk & Talk
		1.2	anatomy of E-Commerce applications	T1	2	Chalk & Talk
		1.3	E-CommerceConsumer applications	T1	3	PPTS
		1.4	E-Commerce organization applications	T1	3	Chalk & Talk, NPTEL/MOOCS
2	CO2: Compare and contrast various electronic Payment Systems. [K3]		**UNIT-II**			
		2.1	Consumer Oriented Electronic commerce	T1	2	Chalk & Talk
		2.2	Mercantile Process models.	T1	2	Chalk & Talk
			1st MID EXAMINATION			
		2.3	Electronic payment systems	T1, R1	3	Chalk & Talk
		2.4	Risks in Electronic payment systems	T1, R1	3	Chalk & Talk, NPTEL/MOOCS
3	CO3: Interpret the Intra Organizational Commerce. [K2]		**UNIT-III**			
		3.1	Intra Organizational Commerce	T1, R3	3	Chalk & Talk, Tutorials
		3.2	Automation Customization	T1, R3	5	Chalk & Talk, Tutorials
		3.3	InternalCommerce	T1, R3	2	Chalk & Talk, Tutorials
		3.4	Supply chain Management	T1, R1	3	Chalk & Talk, Tutorials

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			UNIT-IV			
4	**CO 4:** Outline the corporate digital library and marketing research. [K2]	4.1	Corporate Digital Library	T1,R1	2	Chalk & Talk, Tutorials
		4.2	Document Library, digital Document types	T1,T2	2	Chalk & Talk, Tutorials
		4.3	corporate DataWarehouses.	T1,R1	2	Chalk & Talk, Tutorials
		4.4	Advertising and Marketing	T1, R1	2	Chalk & Talk, Seminar
		4.5	Information based marketing	T1, R1	2	Chalk & Talk, Seminar
		4.6	Advertising on Internet	T1, R1	2	Chalk & Talk, Tutorials
		4.7	on-linemarketing process, market research.	T1, R1	2	Chalk & Talk, Case Study
5	**CO 5:** Analyze resource discovery and information filtering. [K4]]		**UNIT-V**			
		5.1	Consumer Search and Resource Discovery	T1, R1	3	Chalk & Talk, Tutorials
		5.2	Information search and Retrieval	T1, R1	3	Chalk & Talk, Tutorials
		5.3	CommerceCatalogues	T1, R1	2	Chalk & Talk, PPTS
		5.4	Information Filtering	T1,, R1	2	Chalk & Talk, PPTS
		5.5	Digital Video and electronic Commerce	T1,, R1	2	Chalk & Talk, PPTS
				Total	**60**	
			2nd MID EXAMINATION			
			SEMESTER EXAMINATION			

TEXT BOOKS :

T1: Kalakata, Whinston, "Frontiers of electronic commerce", Pearson.

REFERENCE BOOKS :

R1. Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley, "E-Commerce fundamentals and applications"

R2. S.Jaiswal – Galgotia, "E-Commerce".

R3. Efrain Turbon, Jae Lee, David King, H.Michael Chang, "E-Commerce".

R4. Gary P.Schneider, "Electronic Commerce", Thomson.

R5. E-Commerce – Business, Technology, Society, Kenneth C.Taudon, Carol Guyerico Traver.

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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601**

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN 2024 -25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CS4107	CYBER SECURITY	I	Computer Science and Engineering	6	A ,B,C,D

COURSE OUTCOMES: After completion of this course, the students would be able to

C01: Interpret Cyber Security architecture principles [K2].

C02: Identifying System and application security threats and vulnerabilities [K3].

C03: Identifying different classes of attacks [K3].

C04: Cyber Security incidents to apply appropriate response [K3].

C05: Describing risk management processes and practices [K3].

C06: Evaluation of decision-making outcomes of Cyber Security scenarios [K4].

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1. Interpret Cyber Security architecture principles [K2].		**Unit-1. Introduction to Cybercrime:**			
		1.1	Introduction, Cybercrime: Definition and Origins of the Word,	T1, T2	2	Chalk & Talk
		1.2	Cybercrime and Information Security, Who are Cybercriminals? Classifications of Cybercrimes.	T1, T2	2	Chalk & Talk
		1.3	Cybercrime: The Legal Perspectives	T1, T2, R1	1	Chalk & Talk
		1.4	Cybercrimes: An Indian Perspective, Cybercrime and the Indian ITA 2000	T1, T2	2	Chalk & Talk
		1.5	A Global Perspective on Cybercrimes, Cybercrime Era: Survival Mantra for the Netizens.	T1, T2	1	PPT
		1.6	Cyber offenses: How Criminals Plan Them –Introduction	T1, T2, R1	1	Chalk & Talk
		1.7	How Criminals Plan the Attacks, Social Engineering	T1, T2	1	Chalk & Talk
		1.8	Cyber stalking, Cyber cafe and Cybercrimes	T1, T2, R1	2	Chalk & Talk
ASSIGNMENT I EXAMINATION						
2			**Unit-2.** Cybercrime Mobile and Wireless Devices			
		2.1	Introduction, Proliferation of Mobile and Wireless Devices	T1, T2	2	Chalk & Talk
		2.2	Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era	T1, T2	2	PPT

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	C02: Identifying System and application security threats and vulnerabilities [K3]	2.3	Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication Service Security	T1, T2	2	Chalk & Talk
		2.4	Attacks on Mobile/Cell Phones, Mobile Devices: Security Implications for Organizations	T1, T2	2	Chalk & Talk
		2.5	Organizational Measures for Handling Mobile, Organizational Security	T1, T2, R1	2	Student Seminar
		2.6	Policies and Measures in Mobile Computing Era, Laptops.	T1, T2	1	Chalk & Talk
			Unit-3. Tools and Methods Used in Cybercrime			
3	CO3: Identifying different classes of attacks [K3].	3.1	Introduction, Proxy Servers and Anonymizers	T1, T2, R1	1	Chalk & Talk
		3.2	Phishing, Password Cracking, Key loggers and Spywares	T1, T2	2	Chalk & Talk
		3.3	Virus and Worms, Trojan Horses and Backdoors	T1, T2	1	Chalk & Talk
		3.4	Steganography	T1, T2, R1	2	Chalk & Talk
		3.5	DoS and DDoS Attacks	T1, T2	1	Student Seminar
		3.6	SQL Injection, Buffer Overflow, Attacks on Wireless Networks	T1, T2, R1	1	Chalk & Talk
		3.7	Phishing and Identity Theft: Introduction	T1, T2	2	PPT
		3.8	Phishing, IdentityTheft (IDTheft)	T1, T2	1	PPT
			MID I EXAMINATION			
			Unit-4. Cybercrimes and Cyber security:			
		4.1	Why Do We Need Cyber laws	T1, T2	1	Chalk & Talk,
		4.2	The Indian Context, The Indian IT Act	T1, T2	2	Chalk & Talk,
		4.3	Challenges to Indian Law and Cybercrime Scenario in India	T1	1	Chalk & Talk,
		4.4	Consequences of Not Addressing the Weakness in Information Technology Act	T1	2	Chalk & Talk,
4	CO4: Cyber Security incidents to apply appropriate response [K3].	4.5	Digital Signatures and the Indian IT Act	T2	2	PPT
		4.6	Information Security Planning and Governance	T1, T2	1	Chalk & Talk,
		4.7	Information Security Policy Standards, Practices	T1, T2	1	Chalk & Talk,
		4.8	The information Security Blueprint	T1	1	Chalk & Talk,
		4.9	Security education, Training and awareness program	T2	1	Chalk & Talk,
		4.10	Continuing Strategies	T1	1	Chalk & Talk,

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ASSIGNMENT II EXAMINATION						
5	CO5: Describing risk management processes and practices [K3]. CO6: Evaluation of decision-making outcomes of Cyber Security scenarios [K4].	**Unit 5:** Understanding Computer Forensics				
		5.1	Introduction, Historical	T1, T2	1	Chalk & Talk
		5.2	Background of Cyber forensics, Digital Forensics Science	T1, T2	1	PPT
		5.3	The Need for Computer Forensics, Cyber forensics and Digital Evidence	T1	1	Chalk & Talk
		5.4	Forensics Analysis of E-Mail, Digital Forensics Life Cycle	T1	2	Chalk & Talk
		5.5	Chain of Custody Concept, Network Forensics	T1, T2	1	Chalk & Talk
		5.6	Approaching a Computer Forensics Investigation	T1, T2	1	Chalk & Talk
		5.7	Computer Forensics and Steganography	T1, T2	1	Chalk & Talk
		5.8	Relevance of the OSI 7 Layer Model to Computer Forensics	T1, T2, R1	1	Seminar
		5.9	Forensics and Social Networking Sites: The Security/Privacy Threats	T1, T2, R1	1	Chalk & Talk
		5.10	Computer Forensics from Compliance Perspective	T1, T2, R1	2	Chalk & Talk
		5.11	Challenges in Computer Forensics	T1, T2, R1	1	Chalk & Talk
		5.12	Special Tools and Techniques	T1	1	Chalk & Talk
		5.13	Forensics Auditing	T2	1	PPT
		5.14	Antiforensics.	T1, T2	1	Chalk & Talk
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

T1 1.Cyber Security: Understanding Cyber Crimes, Computer Forensics and LegalPerspectives, Nina Godbole, SunitBelapure, Wiley

T2 2. Principles of Information Security, MichealE.Whitman and Herbert J.Mattord, Cengage Learning.

Reference Books:

R1 Information Security, Mark Rhodes, Ousley, MGH.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CS4108	**MOBILE ADHOC & SENSOR NETWORKS (20)**	IV-I	**CSE**	6	CSE-A ,B,C,D

COURSE OUTCOMES: Students are able to
After completion of this course, the students would be able to:

CO 1: Analyse the routing protocols in MANET. [K4]
CO 2: Interpret the TCP over Ad-hoc Networks. [K2]
CO 3: Interpret the data transmission and data acquisition in WSN. [K2]
CO 4: Design and Develop the various heterogeneous architectures. [K6]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO 1: Analyse the routing protocols in MANET. [K4]**		**Unit-I**			
		1.1	Introduction to Ad Hoc Networks	T1, T2	1	Chalk & Talk.
		1.2	Characteristics of MANETs	T1, T2	2	Chalk &Talk
		1.3	Applications of MANETs	T1, T2	2	Chalk & Talk, PPT
		1.4	Challenges of MANETs.	T1, T2	2	Flipped class room
		1.5	Routing in Adhoc Networks: Introduction	T1, T2	1	Chalk & Talk, PPT
		1.6	Topology based versus Position based approaches	T1, T2	2	Flipped class room
		1.7	Topology based routing Protocols	T1, T2	2	Chalk & Talk, PPT
		1.8	Position based routing Protocols	T1, T2	2	Chalk & Talk, PPT
2	**CO 2: Interpret the TCP over Ad-hoc Networks. [K2]**		**Unit-II**			
		2.1	TCP protocol overview, Designed and Fine-Tuned to Wired Networks	T1, T2	2	Chalk & Talk, PPT
		2.2	TCP Basics, TCP Header Format	T1, T2	2	Chalk & Talk, PPT
		2.3	Congestion Control, Round-Trip Time Estimation	T1, T2	1	Chalk & Talk, PPT
		2.5	TCP and MANETs	T1, T2	1	Chalk & Talk, PPT

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		2.6	Effects of Partitions on TCP	T1, T2	2	Flipped class room
		2.7	Impact of Lower Layers on TCP	T1, T2	2	Chalk & Talk, PPT
		2.8	Solutions for TCP over Ad Hoc	T1, T2	1	Chalk & Talk, PPT
		2.9	Mobility-Related, Fairness-Related	T1, T2	2	Chalk & Talk, PPT
MID I EXAMINATION DURING SIXTH WEEK						
3	CO:3 Interpret the data transmission and data acquisition in WSN. [K2]	**Unit-III**				
		3.1	Data Retrieval in Sensor Networks – Introduction	T1, T2	1	Chalk & Talk, PPT
		3.2	Sensing and Communication Range	T1, T2	2	Collaborative learning
		3.3	Design Issues- Challenges	T1, T2	2	Chalk & Talk, PPT
		3.4	Energy Consumption	T1, T2	2	Flipped class room
		3.5	Clustering of Sensors- Regularly placed sensors	T1, T2	2	Chalk & Talk, PPT
		3.6	Heterogeneous WSNs, Mobile Sensors	T1, T2	2	Chalk & Talk, PPT
		3.7	Applications of Sensor Networks	T1, T2	2	Flipped class room
4		**Unit-IV**				
		4.1	Data Retrieval in Sensor Networks- Introduction	T1, T2	1	Chalk & Talk, PPT
		4.2	Classifications of WSNs	T1, T2	2	Chalk & Talk, PPT
		4.3	MAC Layer- Design Issues	T1, T2	2	Chalk & Talk, PPT
		4.4	MAC Layer- MAC Protocols, Link Layer	T1, T2	2	Chalk & Talk, PPT
		4.5	Routing Layer- Network Structure Based, Flat versus Hierarchical, Multipath-Based Routing	T1, T2	2	Chalk & Talk, PPT
		4.6	Query-Based Routing, Location-Based Routing, Transport Layer	T1, T2	2	Chalk & Talk, PPT
		4.7	High-Level Application LayerSupport- Distributed Query Processing, Sensor Databases	T1, T2	2	Chalk & Talk, PPT

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		4.8	Distributed Applications, In-Network Processing, Security	T1, T2	2	Chalk & Talk, PPT
5	CO 4: Design and Develop the various heterogeneous architectures. [K6]		**Unit-V**			
		5.1	Integrating MANETs, WLANs, and Cellular Network – Introduction.	T1, T2	1	Chalk & Talk
		5.2	Ingredients of a Heterogeneous Architecture- Mobile User Stations, Base Station and Access Point	T1, T2	1	Flipped class room
		5.3	Core IP Network (CN), Possible Communication Scenarios, Design Factors	T1, T2	2	Chalk & Talk, PPT
		5.4	Protocol Stack- The Physical Layer, The Data Link Layer, The Network Layer	T1, T2	2	Collaborative learning
		5.5	Transport Layer, Application Layer, Mobility and Connection Management	T1, T2	2	Chalk & Talk, PPT
		5.6	Comparison of the Integrated Architectures.	T1, T2	2	Flipped class room
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Carlos Cordeiro and dharma P. Agrawal, Ad hoc and Sensor Networks – Theory and Application , World Scientific Publications, March 2006, ISBN 981-256-681- 3.
T2	Feng Zhao, Leonidas J. Guibas, "Wireless Sensor Networks: An Information Processing, Approach", Elsevier Science ISBN: 978-1-55860-914-3, (Morgan Kauffman)

	WEB RESOURCES
1	https://scholar.google.co.in/scholar?q=MOBILE+ADHOC+%26+SENSOR+NETWORKS&hl=en&as_sdt =0&as_vis=1&oi=scholar
2	https://link.springer.com/book/10.1007/978-3-540-77024-4
3	https://en.wikipedia.org/wiki/Wireless_ad_hoc_network

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC4117	E&I (R20)	IV-I	CSE	6	A,B,C & D

COURSE OUTCOMES: Student is able to

CO1 : Outline the concepts of Entrepreneurship.[K2]
CO2 : Create the awareness on creativity and innovation.[K6]
CO3 : Adopt the Entrepreneurship Development programs[K6]
CO4 : Evaluate the project planning and feasibility studies.[K5]
CO5 : Analyze the concept of small and micro enterprises.[K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Outline the concepts of Entrepreneurship.[K2]		**Unit-1. Entrepreneur And Entrepreneurship**			
		1.1	Entrepreneur – Definitions, concept of entrepreneur	T1, R1	2	Chalk & Talk
		1.2	characteristics of entrepreneur, types of entrepreneurs	T1, R1	3	Chalk & Talk,PPT
		1.3	concept of entrepreneurship, characteristics of entrepreneurship	T1, R1	2	Chalk & Talk
		1.4	role of entrepreneurship in economic development	T1,R1	2	Chalk & Talk
		1.5	ethics and social responsibilities of an entrepreneur	T1,R1	2	Chalk & Talk,PPT
		1.6	Financial institutional support to entrepreneurs(IDBI,SISI,DIC,NIESBUD, Commercial banks etc.,	T1,R1	2	Chalk & Talk,PPT
2	CO2: Create the awareness on creativity and innovation.[K6]		**Unit-2. Creativity And Innovation In Entrepreneurship**			
		2.1	Meaning and concept of creativity - Nature and characteristics of creativity	T1, R1	2	Chalk & Talk,PPT
		2.2	Creativity Process- Factors affecting creativity	T1, R1	2	Chalk & Talk
		2.3	Meaning and Importance Innovation - Process	T1, R1	2	Chalk & Talk,PPT
		2.4	Distinguish the Creativity and Innovation.	T1, R1	3	Chalk & Talk
3	CO3: Adopt the Entrepreneurship Development programs[K6]		**Unit-3. Entrepreneurship Development Programmes**			
		3.1	Designing Appropriate Training Programme to inculcate Entrepreneurial Spirit	T1, R1	3	Chalk & Talk
		3.2	Training for Entrepreneurs, Entrepreneurship Development Programme (EDP)	T1, R1	2	Chalk & Talk,PPT
		3.3	Need and objectives of EDP's	T1, R1	3	Chalk & Talk
			MID I EXAMINATION			
		3.4	Phases and evolution on EDP's existing and new Entrepreneurs.	T1, R1	3	Chalk & Talk,PPT

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		Unit-4. Project Planning And Feasibility Studies				
4	CO4: Evaluate the project planning and feasibility studies.[K5]	4.1	Meaning of a project, Project identification – Sources of new Ideas	T2, R2	3	Chalk & Talk
		4.2	Methods of generating ideas, Project selection,	T2, R2	3	Chalk & Talk,PPT
		4.3	Project Feasibility Study -Project evaluation and Techniques	T2, R2	3	Chalk & Talk
		4.4	(PBP, ARR, NPV, IRR & PI).	T2, R2	4	Chalk & Talk
5	CO5:Analyze the concept of small and micro enterprises.[K4]	**Unit 5. Small And Micro Enterprises**				
		5.1	Importance, definitions, MSME's Development Act 2006	T2, R2	3	Chalk & Talk,PPT
		5.2	policies and their support to MSMEs	T2, R2	2	Chalk & Talk
		5.3	Growth of Firm and growth strategies,	T2, R3	3	Chalk & Talk
		5.4	Factors inducing growth	T2, R2	2	Chalk & Talk,PPT
		5.5	Sickness in small business and remedies.	T2, R3	2	Chalk & Talk
				Total	60	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1 "Entrepreneurship", Arya Kumar: Pearson, Publishing House, New Delhi, 2012.
T2 "Entrepreneurship', VSP Rao, Kuratko: Cengage Learning, New Delhi,2012
T3 ShoimoMaital, DVR Seshadri, "Innovation Management", Response Books 2007

Reference Books:

R1 "Entrepreneurship Development" B.Janakiram, M Rizwana: Excel Books, ND, 2011
R2 "Entrepreneurship Development", P.C.Shejwalkar Everest Publishing House, ND, 2011

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LESSON PLAN

Academic Year 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
20BCC6OE11	DIGITAL MARKETING ((R20)	VII	Computer Science and Engineering	6	A,B,C,D

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO1: Develop insight on Current Trends – Digital and Social Statistics (Infographics) (K6)

CO2: Analyze the Digital Marketing Platforms like Face book, Twitter, YouTube etc.(K4)

CO3: Design the various strategies involved in Marketing products and Services Digitally.(K6)

CO4: Analyze the basics of Search Engine Optimization (SEO) and Mobile Marketing.(K4)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1. Develop insight on Current Trends – Digital and Social Statistics (Infographics) (K6)		**UNIT-1: Introduction to Digital Marketing**			
		1.1	Evolution of Digital Marketing from traditional	T1, T2, R1,R3	2	Chalk& Talk, PPT
		1.2	Role of Internet, Current trends, Digital landscape	T1, T2, R1,R3	2	Learning & Tutorial
		1.3	Info-graphics, Implications for business & society	T1, T2, R1,R3	1	Chalk& Talk,
		1.4	Emergence of digital marketing as a tool	T1, T2, R1,R3	1	Chalk&Talk, PPT
		1.5	Drivers of the new marketing environment	T1, T2, R1,R3	1	Chal&Talk,
		1.6	Revolutionizing the Traditional Business Network	T1, T2, R1,R3	1	Chalk&Talk, PPT
		1.7	Digital marketing plan, Digital marketing models	T1, T2, R1,R3	2	Learning & Tutorial
		1.8	Digital marketing strategy, P.O.E.M. framework	T1, T2, R1,R3	2	PPT, Flipped
2	CO 2.		**UNIT-2: Internet Marketing and Digital Marketing Mix**			

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	Analyze the Digital Marketing Platforms like Face book, Twitter, YouTube etc.(K4)	2.1	Internet Marketing, Opportunities and challenges	T1, T2, R1,R3	2	Chalk& PPT Tutori
		2.2	Digital marketing framework, Digital Marketing mix, Pay for Search Advertisements	T1, T2, R1,R3	2	Chalk& PPT
		2.3	Impact of digital channels on IMC Search Engine Advertising Ad Placement, Ad Rank	T1, T2, R1,R3	2	Chalk& Talk, PPT Tutorial
		2.4	Creating Ad Campaigns, Campaign Report Generation Display marketing, Types of Display Ads, Buying Models	T1, T2, R1,R3	2	Chalk& Tal PPT
		2.5	Programmable Digital Marketing, Analytical Tools and examples	T1, T2, R1,R3	2	Chalk&Talk
		2.6	YouTube marketing with examples	T1, T2, R1,R3	2	Chalk& Talk
			UNIT-3. Social Media Marketing			
3	CO 3. Analyze the basics of Search Engine Optimization (SEO) and Mobile Marketing.(K4)	3.1	Introduction to social media platforms, penetration & characteristics	T1, T2, R1,R3	2	Chalk& Talk, PPT, Blended Learning & Tutorial
		3.2	Building a successful social media marketing strategy, Face book Marketing	T1, T2, R1,R3	2	Chalk& Talk
		3.3	Business through Face book Marketing, creating Advertising Campaigns	T1, T2, R1,R3	2	Chalk& Talk
		3.4	Adverts, Face book Marketing Tools LinkedIn Marketing, Introduction and Importance of LinkedIn Marketing	T1, T2, R1,R3	2	Chalk&Talk PPT
		3.5	Framing LinkedIn Strategy, Lead Generation through LinkedIn	T1, T2, R1,R3	2	Chalk&Talk
		3.6	Content Strategy, Analytics and Targeting.	T1, T2, R1,R3	2	Chalk& Talk
			MID I EXAMINATION DURING SIXTH WEEK			
4			**UNIT-4: Twitter Marketing**			

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	CO4: Design the various strategies involved in Marketing products and Services digitally.(k6)	4.1	Introduction to Twitter Marketing, how twitter Marketing is framing content strategy.	T1, T2, R1,R3	2	Chalk&Talk
		4.2	Twitter Advertising Campaigns, Instagram and Snapchat.	T1, T2, R1,R3	2	Chalk& Talk, PPT , Web Resources Tutorial
		4.3	Digital Marketing Strategies , Mobile Advertising	T1, T2, R1,R3	2	Chalk& Talk, PPT Tutorial
		4.4	Forms of Mobile Marketing	T1, T2, R1,R3	2	Chalk&Talk
		4.5	Features Mobile Campaign Development	T1, T2, R1,R3	2	Chalk&Talk
		4.6	Mobile Advertising Analytics.	T1, T2, R1,R3	2	Chal&Talk, students collaborative learning
5	CO5: Design the various strategies involved in Marketing products and Services digitally.(k6)	**UNIT – 5:Introduction to SEO**				
		5.1	Web Analytics, Mobile Marketing.	T1, T2, R1,R3	2	Chalk&Talk, PPT , Students Seminars &
		5.2	Trends in Digital Advertising, How to use internet &search engines	T1, T2, R1,R3	2	Chalk&Talk, Tutorial
		5.3	Search engine and its working pattern, On-page and off-page optimization	T1, T2, R1,R3	2	Chalk& Talk, PPT Chalk&Talk,
		5.4	SEO Tactics, Introduction to SEM Web Analytics, Google Analytics & Google AdWords	T1, T2, R1,R3	2	Chalk&Talk, PPT , Students Seminars & Tutorial
		5.5	data collection for web analytics, multichannel attribution	T1, T2, R1,R3	2	Chalk&Talk,
		5.6	Trends in digital advertising.	T1, T2, R1,R3	2	Chalk&Talk, PPT
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

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TEXT BOOKS:

1. Seema Gupta, Digital Marketing, Mc-Graw Hill, 1st Edition- 2017
2. Ian Dodson, The Art of Digital Marketing, Wiley Latest Edition
3. Puneet Singh Bhatia, Fundamentals of Digital Marketing, Pearson, 1st Edition – 2017

REFERENCE BOOKS:

1. Vandana Ahuja, Digital Marketing, Oxford University Press, Latest Edition
2. Philip Kotler, Marketing 4.0: – Moving from Traditional to Digital, Wiley 2017
3. Melissa S. Barker |Donald I. Barker | Nicholas F. Bormann | Debra Zahay | Mary Lou Roberts, Social Media Marketing: AStrategic Approach, Cengage Latest Edition
4. Ward Hanson , Kirthi Kaly anam, Internet Marketing & e-Commerce Cengage Latest Edition

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LESSON PLAN (COMMON TO ALL BRANCHES)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC21MC	ENVIRONMENTAL STUDIES (R23)	II	IT	2	....

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO:1 Understand multi-disciplinary nature of environmental studies and Analyze the natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources.(K2)	**Unit-1. Multidisciplinary nature of Environmental Studies**				
		1.1	Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.	T1, T2, R1	1	Chalk& Talk
		1.2	Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems	T1, T2, R1	1	Chalk& Talk
		1.3	Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction	T1, T2, R1	2	Active learning & PPT
		1.4	Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems	T1	2	PPT
		1.5	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.	T1, T2, R1	1	Active learning & PPT
2	CO2: Explain the concepts of the ecosystem and its function in the environment. The	**Unit-2.** Ecosystems				
		2.1	Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in	T1, T2, R3	2	Active learning & PPT

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	need for protecting the producers and consumers in various ecosystems and their role in the food web. Explain the biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity. (K2)		the ecosystem – Ecological succession mining, dams and effects on forest and tribal people.			
		2.2	Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:	T1, T2, R3	2	PPT & Case Study
		2.3	a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem	T1, T2, R3	1	Chalk& Talk
		2.4	d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) Biodiversity and Its Conservation : Introduction and Definition: genetic, species and ecosystem diversity.	T1, T2, R3	1	Chalk& Talk
		2.5	Bio-geographical classification of India Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values	T1	1	Chalk& Talk
		2.6	Biodiversity at global, National and local levels – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts	T1, T2, R1	1	Chalk& Talk
		Unit-3. Environmental Pollution:				
3	CO3: Distinguish various attributes of the pollution, their impacts and measures to reduce or control the pollution along with waste management(K2)	3.1	Environmental Pollution: Definition, Cause, effects and control measures of: a. Air Pollution.	T1, T2, R1	1	Chalk& Talk
		3.2	Definition, Cause, effects and control measures of: • b.Water pollution c.Soil pollution	T1, T2, R1	1	Chalk& Talk
		3.3	d.Marine pollution e.Noise pollution	T1, T2, R1	1	Active learning & PPT

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		3.4	Solid Waste Management: Causes, effects and control measures of urban and industrial wastes	T1, T2, R1	1	PPT
		3.5	Role of an individual in prevention of pollution – Pollution case studies	T1, T2, R1	1	Tutorial
		3.6	Disaster management: floods, earthquake, cyclone and landslides.	T1, T2, R1	1	Tutorial & PPT
4	CO4: Understand the rainwater harvesting, watershed management, and ozone layer depletion and waste land reclamation. (K2))	**Unit-4.** Social Issues and the Environment:				
		4.1	Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershedmanagement	T1, T2, R3	2	Chalk& Talk, Industrial Visit
		4.2	Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies	T1, T2, R3	2	PPT
		4.3	Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act	T1, T2, R3	2	Chalk& Talk, Case Study
		4.4	Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.	T1, T2, R3	1	Tutorial, PPT
5	CO 5: Illustrate the causes of population explosion, value education and welfare programmes. (K3).	**Unit 5.** Human Population And The Environment:				
		5.1	Population growth, variation among nations. Population explosion	T1, T2, R3	1	PPT, Chalk& Talk
		5.2	Family Welfare Programmes. – Environment and human health	T1, T2, R3 T1	1	PPT Active learning & PPT
		5.3	Human Rights – Value Education – HIV/AIDS	T1, T2, R3	1	Case Study & PPT
		5.4	Women and Child Welfare	T1, T2, R1	1	Chalk& Talk
		5.5	Role of information Technology in Environment and human health – Case	T1, T2, R1	1	Chalk& Talk

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		studies.			
	5.6	Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.	T1, T2, R1	1	Chalk& Talk, Active Learning
			Total	**34**	

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Erach Bharucha,Textbook of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
T2	Palaniswamy, Environmental Studies, 2/e, Pearson education, 2014.
T3	S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.
T4	K.Raghavan Nambiar, "Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e,Cengage Publications, 2012.
R2	M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BSPublication, 2014.
R3	J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering,Prentice Hall of India Private limited, 1988.
R4	G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House,2018.
R5	Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineeringand Science, 1/e, Prentice Hall of India Private limited, 1991

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DEPARTMENT OF INFORMATION TECHNOLOGY
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2103	DIGITAL LOGIC & COMPUTER ORGANIZATION	I	IT	5	A & B

After completion of this course the student should be able to

CO	Course Outcome Statement	
CO1	Analyze the data representation and digital logic circuits.	[K4]
CO2	Analyze the basic structure of computers.	[K4]
CO3	Analyze the computer arithmetic algorithms	[K4]
CO4	Analyze the processor, memory and input-output organizations.	[K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO 1:** Analyze the data representation and digital logic circuits. [K4]		**Unit-1. Data Representation**			
		1.1	Number system	T1,T2, R2	2	Chalk & Talk
		1.2	Fixed point Representation	T1, T2, R2	1	Chalk & Talk
		1.3	Floating Point Representation	T1, T2, R2	2	Chalk & Talk
		1.4	Number base conversions	T1, T2, R2	2	Chalk & Talk
		1.5	Octal and Hexa decimal Numbers	T1, T2, R1	2	Chalk & Talk PPT
		1.6	components	T1, T2, R1	1	Chalk & Talk
		1.7	Signed binary numbers, Binary codes.	T1, T2, R1	2	Chalk & Talk
		1.8	**Digital Logic Circuits-I** Basic Logic Functions, Logic gates	T1, T2, R1	2	Chalk & Talk,
		1.9	universal logic gates	T1, T2, R1	1	Chalk & Talk,
		1.10	K-Map Simplification	T1, T2, R1	3	Chalk & Talk,
		1.11	Combinational Circuits	T1, T2, R1	2	Chalk & Talk,
		1.12	Decoders, Multiplexers.	T1, T2, R1	2	Chalk & Talk,

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ASSIGNMENT I- EXAMINATION

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2	CO2: Analyze the basic structure of computers. [K4]	**Unit-2. Digital Logic Circuits-II**				
		2.1	Sequential Circuits	T1, T2,R1	1	Chalk & Talk,
		2.2	Flip Flops, Binary counters	T1, T2,R1	2	Chalk & Talk,
		2.3	Registers, Shift Registers	T1, T2,R1	2	Chalk & Talk,
		2.4	Ripple counters.	T1, T2,R1	1	Chalk & Talk, PPT
		2.5	Basic Structure of Computers Computer Types, Functional units	T1, T2,R1	2	Chalk & Talk, PPT
		2.6	Basic operational concepts, Bus structures,	T1, T2,R1	2	Chalk & Talk, PPT
		2.7	Software, Performance, multiprocessors and multi computers	T1, T2,R1	2	Chalk & Talk, PPT
		2.8	Computer Generations, Von-Neumann Architecture.	T1, T2,R1	1	Chalk & Talk, PPT
3	CO3: Analyze the computer arithmetic algorithms [K4]	**Unit-3. Computer Arithmetic**				
		3.1	Addition and Subtraction of Signed Numbers	T1, T2, R2	1	Chalk & Talk
		3.2	Design of Fast Adders, Multiplication of Positive Numbers	T1, T2, R2	2	Chalk & Talk, PPT
		3.3	Signed-oper and Multiplication, Fast Multiplication,	T1, T2, R2	2	Chalk & Talk , PPT
		3.4	integer Division, Floating-Point Numbers and Operations	T1, T2, R2	2	Chalk & Talk
		MID-I EXAMINATION				
		3.5	Processor Organization Fundamental Concepts	T1, T2, R2	2	Chalk & Talk
		3.6	Execution of a Complete Instruction, Multiple-Bus Organization	T1, T2, R2	3	Chalk & Talk
		3.7	Hardwired Control and Multiprogrammed Control.	T1, T2, R2	1	Chalk & Talk
4	CO4: Analyze the processor, memory and input-output organizations. [K4]	**Unit 4 : The Memory Organization**				
		4.1	Basic Concepts, Semiconductor RAM Memories, Read-Only Memories,	T1, T3,R3	3	Chalk & Talk
		4.2	Speed, Size and Cost, Cache Memories	T1, T3,R3	1	Chalk & Talk
		4.3	Performance Considerations, Virtual Memories,,	T1, T3,R3	2	Chalk & Talk
		4.4	Memory Management Requirements, Secondary Stora	T1, T3,R3	2	Chalk & Talk,
		ASSIGNMENT II EXAMINATION				

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5	CO4: Analyze the processor, memory and input-output organizations. [K4]	**Unit 5. Input/Output Organization**				
		5.1	Accessing I/O Devices	T3, R2	2	Chalk & Talk
		5.2	Interrupts, Processor Examples	T3, R2	2	PPT
		5.3	Direct Memory Access	T3, R2	1	Chalk & Talk
		5.4	Buses, Interface Circuits	T3, R2	1	Chalk & Talk
		5.5	Standard I/O Interfaces.	T3, R2	2	Chalk & Talk
					TOTAL: 64	
		MID II EXAMINATION				
		END EXAMINATIONS				

TEXT BOOKS: Textbooks:

1. Computer Organization, Carl Hamacher, Zvonko Vranesic, SafwatZaky,6thedition, McGrawHill
2. Digital Design, 6thEdition, M.Morris Mano, Pearson Education.
3. Organization and Architecture,William Stallings, 11thEdition, Pearson.

Reference Books:

1. Computer Systems Architecture, M.Moris Mano, 3rdEdition, Pearson
2. Computer Organization and Design,David A.Paterson, JohnL. Hennessy, Elsevier
3. Fundamentals of Logic Design, Roth, 5thEdition, Thomson

ONLINE LEARNING RESOURCES:

https://nptel.ac.in/courses/106/103/106103068/

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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601**

DEPARTMENT OF IT& CSE (AI)
LESSON PLAN

Subject Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2105	Object Oriented Programming Through Java(R23)	3	IT	6	A&B

After completion of this course the student should be able to

CO	Course Outcome Statement
CO1	Interpret the syntax and semantics of java programs language and OOPs concepts. [K2]
CO2	Make use of different predefined classes and packages and interfaces to develop programs using OOPs concepts. [K3]
CO3	Apply exception handling and FILE I/O operations on java programs. [K3]
CO4	Make use of Multithreading and String handling Functions on java. [K3]
CO5	Make use of Java FX in the design of GUI Applications, Event-Handling to develop GUI and JDBC connections. [K3]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
	CO 1: Interpret the syntax and semantics of java programs language and OOPs concepts. [K2]	**Unit-1. Object Oriented Programming**				
		1.1	Introduction to Java	T1	1	Chalk & Talk
		1.2	Writing Simple Java Programs, Elements or Tokens in Java Programs	T1	1	Chalk & Talk
		1.3	Java Statements	T1, T2, R1	2	Chalk & Talk
		1.4	Command Line Arguments, User Input to Programs	T1, T2, R2	2	Chalk & Talk
		1.5	Escape Sequences Comments, Programming Style	T1, T2, R1	1	Chalk & Talk
		1.6	Data Types, Variables, and Operators :Introduction, Data Types in Java	T1, T2, R1	1	Chalk & Talk
		1.7	Declaration of Variables, Data Types, Type Casting, Scope of Variable Identifier, Literal Constants	T1, T2, R1	2	Chalk & Talk
		1.8	Symbolic Constants, Formatted Output with printf() Method, Static Variables and Methods, Attribute Final	T1, T2, R1	1	Chalk & Talk
		1.9	Introduction to Operators, Precedence and Associativity of Operators, Assignment Operator (=), Basic Arithmetic Operators, Increment (++) and Decrement (- -) Operators.	T1, T2, R1	1	Chalk & Talk

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		1.10	Ternary Operator, Relational Operators, Boolean Logical Operators, Bitwise Logical Operators	T1, T2, R1	1	Chalk & Talk, PPT
		1.11	Control Statements: Introduction, if Expression, Nested if Expressions, if–else Expressions, Ternary Operator?:, Switch Statement, Iteration Statements, while Expression	T1, T2, R1	1	Chalk & Talk, PPT
		1.12	do–while Loop, for Loop, Nested for Loop, For–Each for Loop, Break Statement, Continue Statement	T1, T2, R1	1	Chalk & Talk, PPT
ASSIGNMENT I- EXAMINATION						
2	**CO2**: Make use of different predefined classes and packages and interfaces to develop programs using OOPs concepts. [K3]	**Unit-2. Classes and Objects**				
		2.1	Introduction, Class Declaration and Modifiers, Class Members, Declaration of Class Objects	T1, T2, R1	1	Chalk & Talk, PPT
		2.2	Assigning One Object to Another Access Control for Class Members	T1, T2, R1	1	Chalk & Talk, PPT
		2.3	Accessing Private Members of Class,	T1, T2, R1	T1	Chalk & Talk, PPT
		2.4	Constructor Methods for Class, Overloaded Constructor Methods	T1, T2, R1	1	Chalk & Talk, PPT
		2.5	Nested Classes, Final Class and Methods	T1, T2, R1	1	Chalk & Talk, PPT
		2.6	Passing Arguments by Value and by Reference, Keyword this	T1, T2, R1	1	Chalk & Talk, PPT
		2.7	Introduction, Defining Methods, Overloaded Methods	T1, T2, R1	1	Chalk & Talk, PPT
		2.8	Overloaded Constructor Methods	T1, T2, R1	1	Chalk & Talk, PPT
		2.9	Class Objects as Parameters in Methods, Access Control	T1, T2, R1	1	Chalk & Talk, PPT
		2.10	Recursive Methods, Nesting of Methods	T1, T2, R1	1	Chalk & Talk, PPT
		2.11	Overriding Methods, Attributes Final and Static	T1, T2, R1	1	Chalk & Talk, PPT
MID -1 EXAMINATIONS						
3	**CO3:**Apply exception handling and FILE I/O operations on java programs. [K3]	**Unit-3. Arrays**				
		3.1	Introduction, Declaration and Initialization of Arrays	T1, T2, R1	1	Chalk & Talk
		3.2	Storage of Array in Computer Memory, Accessing Elements of Arrays	T1, T2, R1	1	Chalk & Talk, PPT

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		3.3	Operations on Array Elements, Assigning Array to Another Array	T1, T2, R1	2	Chalk & Talk , PPT
		3.4	Dynamic Change of Array Size, Sorting of Arrays, Search for Values in Arrays	T1, T2, R1	2	Chalk & Talk
		3.5	Class Arrays, Two-dimensional Arrays, Arrays of Varying Lengths	T1, T2, R1	2	Chalk & Talk
		3.6	Three dimensional Arrays, Arrays as Vectors	T1, T2, R1	1	Students seminar
		3.7	**Inheritance**: Introduction, Process of Inheritance, Types of Inheritances	T1, T2, R1	1	Chalk & Talk
		3.8	Universal Super Class ,Object Class, Inhibiting Inheritance of Class Using Final, Access Control,	T1, T2, R1	1	Chalk & Talk
		3.9	Multilevel Inheritance, Application of Keyword Super, Constructor Method	T1, T2, R1	1	Chalk & Talk
		3.10	Inheritance, Method Overriding Dynamic Method Dispatch, Abstract Classes, Interfaces and Inheritance	T1, T2, R1	1	Chalk & Talk
		3.11	**Interfaces**: Introduction, Declaration of Interface, Implementation of Interface, Multiple Interfaces, Nested Interfaces, Inheritance of Interfaces	T1, T2, R1	1	Chalk & Talk
		3.12	Default Methods in Interfaces, Static Methods in Interface, Functional Interfaces, Annotations.	T1, T2, R1	1	Chalk & Talk
ASSIGNMENT II- EXAMINATION						
4	**CO4**: Make use of Multithreading and String handling Functions on java. [K3]	**Unit 4 : Pointers & User Defined Data types**				
		4.1	**Packages and Java Library:** Introduction, Defining Package, Importing Packages and Classes into Programs, Path and Class Path, Access Control, P	T1, T2,R1	1	Chalk & Talk
		4.2	Packages in Java SE, Java.lang Package and its Classes, Class Object, Enumeration, class Math, Wrapper Classes, Auto-boxing and Auto-unboxing, Java util Classes and Interfaces, Formatter Class, Random Class	T1, T2,R1	1	PPT
		4.3	Time Package, Class Instant (java.time.Instant), Formatting for Date/Time in Java, Temporal Adjusters Class, Temporal Adjusters Class.	T1, T2,R1	1	Student seminar
		4.4	**Exception Handling:** Introduction, Hierarchy of Standard Exception Classes, Keywords throws and throw, try, catch, and finally Blocks,	T1, T2,R1	1	Chalk & Talk, PPT
		4.5	Multiple Catch Clauses, Class	T1, T2,R1		Chalk &

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			throwable.			Talk, PPT
		4.6	Unchecked Exceptios, Checked Exceptions	T1, T2,R1	1	Chalk & Talk
		4.7	**Java I/O and File:** Java I/O API, standard I/O streams, types,	T1, T2,R1	2	Chalk & Talk
		4.8	Byte streams, Character streams,	T1, T2,R1	1	Chalk & Talk
		4.9	Scanner class , Examples	T1, T2,R1	1	Chalk & Talk
		4.10	Files in Java	T1, T2,R1	1	Chalk & Talk
5	**CO5:** Make use of Java FX in the design of GUI Applications, Event-Handling to develop GUI and JDBC connections. [K3]	**Unit 5. Functions & File Handling**				
		5.1	**String Handling in Java:**, Introduction, Interface Char Sequence Characters.	T1, T2, R1	1	Chalk & Talk
		5.2	Class String, Methods for Extracting from Strings	T1, T2,R1	1	PPT
		5.3	Comparison, Modifying, Searching; Class String Buffer	T1, T2,R1	1	Student Seminars
		5.4	Multithreaded Programming: Introduction, Need for Multiple Threads Multithreaded Programming for Multi-core Processor,	T1, T2,R1	2	Chalk & Talk
		5.5	Thread Class, Main Thread-Creation of New Threads, Thread States, Thread Priority-Synchronization, Deadlock and Race Situations	T1, T2,R1	1	Chalk & Talk
		5.6	Inter-thread Communication - Suspending, Resuming, and Stopping of Threads	T1, T2,R1	1	Chalk & Talk, PPT
		5.7	**Java Database Connectivity:** Introduction,JDBC Architecture, Installing MySQL and MySQL Connector/J,	T1, T2,R1	2	Chalk & Talk
		5.8	JDBC Environment Setup, Establishing JDBC Database	T1, T2,R1	1	Chalk & Talk
		5.9	Connections, Result Set Interface	T1, T2,R1	1	Chalk & Talk
		5.10	**Java FX GUI:** Java FX Scene Builder, Java FX App Window Structure, ,	T1, T2,R1	1	Chalk & Talk
		5.11	displaying text and image, event handling	T1, T2,R1	1	
		5.12	laying out nodes in scene graph, mouse events	T1, T2,R1	1	
					TOTAL: 67	
			MID II EXAMINATION			
			END EXAMINATIONS			

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TEXT BOOKS:

1. JAVA one step ahead, Anitha Seth, B.L.Juneja, Oxford
2. Joy with JAVA, Fundamentals of Object Oriented Programming, DebasisSamanta, MonalisaSarma, Cambridge, 2023
3. . JAVA 9 for Programmers, Paul Deitel, Harvey Deitel, 4th Edition, Pearson

REFERENCES BOOKS:

1. The complete Reference Java, 11thedition, Herbert Schildt,TMH
2. Introduction to Java programming, 7th Edition, Y Daniel Liang, Pearson

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DEPARTMENT OFINFORMATION TECHNOLOGY
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R23CC2104	Advanced Data Structures & Algorithm Analysis (R23)	I	IT	5	A&B

COURSE OUTCOMES:

After successful completion of this course, students will be able to:
CO 1: Apply asymptotic notations to measure the performance of algorithms [K3]
CO 2: Appling divide and conquer parading when an algorithmic design situation calls for it. [K3]
CO 3: Construct greedy algorithms and dynamic programming techniques to solve problems [K3]
CO 4: Utilize backtracking and branch and bound algorithms to solve combinatorial problems construct [K3]
CO 5: Classifying computational problems into NP, NP-Hard, and NP-Complete. [K4]

Unit No	Outcome		Topics/Activity	Ref./ Text Book	Hours	Delivery Method
1	CO 1: Apply asymptotic notations to measure the performance of algorithms [K3]		**Unit-1: Introduction**			
		1.1	Introduction to Algorithm Analysis	T1	1	Chalk & Talk
		1.2	Space and Time Complexity analysis	T1	1	Chalk & Talk
		1.3	Asymptotic Notations	T1	2	PPT
			AVL Trees			
		1.4	Creation	T1	1	Chalk & Talk
		1.5	Insertion	T1	2	Chalk & Talk
		1.6	Deletion operations and Applications	T1	2	Chalk & Talk
			Heap-Trees (Priority Queues)			Chalk & Talk
		1.7	Min and Max Heaps	T1	2	
		1.8	Operations and Applications	T1	2	Chalk & Talk
FIRST ASSIGNMENT						
	CO 2: Appling divide and conquer parading when an algorithmic design situation calls for it. [K3]		**Unit-2: Graphs**			
		2.1	Terminology, Representations	T1	1	PPT
		2.2	Basic Search and Traversals	T1	2	Chalk & Talk
			Graphs			

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2		2.3	Connected Components and Biconnected Components, Applications	T1	2	Chalk & Talk
		2.4	Divide and conquer	T1	2	Chalk & Talk
		2.5	The General Method	T1	1	Chalk & Talk
		2.6	Quick Sort	T1	2	Chalk & Talk
		2.7	Merge Sort	T1	2	Chalk & Talk
		2.8	Strassen's matrix multiplication	T1	2	Chalk & Talk
3	CO 3: Construct greedy algorithms and dynamic programming techniques to solve problems [K3]	**Unit-3: Greedy Method**				
		3.1	General Method	T1	1	PPT
		3.2	Job Sequencing with deadlines	T1	1	Chalk & Talk
		3.3	Knapsack Problem	T1	2	Chalk & Talk
		3.4	Minimum cost spanning trees	T1	2	Chalk & Talk
		3.5	Single Source Shortest Paths	T1	2	Chalk & Talk
		MID I EXAMINATION				
		Dynamic Programming				
		3.6	General Method	T1	1	Chalk & Talk
		3.7	All pairs shortest paths	T1	2	Chalk & Talk
		3.8	0/1 Knapsack	T1	2	Chalk & Talk
		3.9	String Editing	T1	2	Chalk & Talk
		3.10	Travelling Salesperson problem	T1	2	Chalk & Talk
		3.11	Optimal Binary Search Trees	T1	2	Chalk & Talk
	CO 4: Utilize backtracking and branch and bound algorithms to solve combinatorial problems construct [K3]	**Unit-4: Backtracking**				
		4.1	General Method	T1	1	Chalk & Talk
		4.2	8-Queens Problem	T1	2	Chalk & Talk
		4.3	Sum of Subsets problem	T1	2	Chalk & Talk

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4		4.4	Graph Coloring	T1	2	Chalk & Talk
		4.5	0/1 Knapsack Problem	T1	2	Chalk & Talk
			Branch and Bound			
		4.6	The General Method	T1	1	Chalk & Talk
		4.7	0/1 Knapsack Problem	T1	2	Chalk & Talk
		4.8	Travelling Salesperson problem	T1	2	Chalk & Talk
SECOND ASSIGNMENT						
5	CO 5: Classifying computational problems into NP, NP-Hard, and NP-Complete. [K4]		**Unit-5: NP Hard and NP Complete Problems**			
		5.1	Basic Concepts	T1	1	PPT
			NP Hard Graph Problems			
		5.2	Clique Decision Problem (CDP)	T1	1	Chalk & Talk
		5.3	Traveling Salesperson Decision Problem (TSP)	T1	2	Chalk & Talk
			NP Hard Scheduling Problems			
		5.4	Job Shop Scheduling	T1	2	Chalk & Talk
Total Number of Hours:66						
MID II EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS	
1	Fundamentals of Data Structures in C++, Ellis Horowitz, Sartaj Sahni, Mehta Dinesh 2nd Edition Universities Press.
2	Computer Algorithms/C++ Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran 2nd Edition University Press
REFERENCE BOOKS	
1	Data Structures and program design in C, Robert Kruse, Pearson Education Asia
2	An introduction to Data Structures with applications, Trembley & Sorenson, McGraw Hill
3	The Art of Computer Programming, Vol.1: Fundamental Algorithms, Donald E Knuth, Addison-Wesley, 1997.
4	Data Structures using C & C++: Langsam, Augenstein & Tanenbaum, Pearson, 1995
5	Algorithms + Data Structures & Programs:, N.Wirth, PHI

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6	Fundamentals of Data Structures in C++: Horowitz Sahni & Mehta, Galgottia Pub.
7	Data structures in Java:, Thomas Standish, Pearson Education Asia
ONLINE LEARNING RESOURCES	
1	https://www.tutorialspoint.com/advanced_data_structures/index.asp
2	http://peterindia.net/Algorithms.html
3	Abdul Bari, 1. Introduction to Algorithms (youtube.com)

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DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2101	DISCRETE MATHEMATICS & GRAPH THEORY	II-I	CSE, IT, AI, AI-ML, CS, DS	5	ALL

CO1: Build skills in solving mathematical problems. (K3)
CO2: Comprehend mathematical principles and logic. (K4)
CO3: Demonstrate knowledge of mathematical modelling and proficiency in using mathematical software. (K6)
CO4: Manipulate and analyze data numerically and/or graphically appropriate Software. (K3)
CO5: How to communicate effectively mathematical ideas/results verbally or in writing. (K1)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT – I: MATHEMATICAL LOGIC			
1	**CO1**: Build skills in solving mathematical problems. (K3)	1.1	Statements and Notations, Connectives - Negation	T1, T2, R1	1	Chalk & Talk, PPT
		1.2	Conjunction, Disjunction, Statement Formulas and Truth tables	T1, T2, R1	1	Chalk & Talk
		1.3	Conditional and Bi Conditional Statements, Well-formed Formulas, Tautologies, Equivalence of Formulas	T1, T2, R1	1	Chalk & Talk
		1.4	Duality Law, Tautological Implications, Functionally Complete Sets of Connectives, Other Connectives	T1, T2, R1	1	Chalk & Talk, PPT
		1.5	Disjunctive Normal Forms, Conjunctive Normal Forms	T1, T2, R1	1	Chalk & Talk
		1.6	Principal Disjunctive Normal Forms, Principal Conjunctive Normal Forms	T1, T2, R1	1	Chalk & Talk
		1.7	Introduction, Validity Using Truth Tables,-I, Validity Using Truth Tables-II	T1, T2,T3, R1	1	Chalk & Talk, PPT
		1.8	Consistency of Premises, Indirect method of proof	T1, T2, R1	1	Chalk & Talk PPT
		1.9	**Predicate calculus:** Predicates, Statement Function	T1, T2, R1	1	Chalk & Talk
		1.10	Variables and Quantifiers	T1, T2, R1	1	Chalk & Talk
		1.11	Free and bound variables	T1, T2, R1, R2	1	Tutorials
		1.12	Inference Theory of Predicate Calculus-I	T1, T2, R1, R2	1	Tutorials
			ASSIGNMENT-I EXAMINATION			
			UNIT – II: SET THEORY			

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2	**CO2:** Comprehend mathematical principles and logic. (K4)	2.1	Operations on Sets, Principle of Inclusion-Exclusion	T1, T2,R1	1	Chalk & Tal PPT
		2.2	Relations: Properties	T1, T2, R1	1	Chalk & Talk
		2.3	Operations, Partition and Covering	T1, T2, R1	1	Chalk & Talk
		2.4	Transitive Closure	T1, T2, R1	1	Chalk & Talk
		2.5	Equivalence	T1, T2, R1	1	Chalk & Talk
		2.6	Compatibility	T1, T2,R1	1	PPT
		2.7	Partial Ordering	T1, T2, R1, R2	1	Chalk & Talk
		2.8	Hasse Diagrams	T1, T2, R1. R3	1	Chalk & Talk, PPT
		2.9	Functions: Bijective, Composition	T1, T2, R1, R2	1	Chalk & Talk
		2.10	Inverse, Permutation	T1, T2, R1	1	Chalk & Talk Students Seminars
		2.11	Recursive Functions	T1, T2,T3, R1	1	Chalk & Talk, Tutorials
		2.12	Lattice and its Properties	T1, T2, R1	1	Chalk & Talk
			MID-I EXAMINATION			
3	**CO3:** Demonstrate knowledge of mathematical modeling and proficiency in using mathematical software. (K6)		**UNIT – III: CAMBINATORICS AND RECURRENCE RELATIONS**			
		3.1	Basis of Counting, Permutations	T1, T2, T3, R1	1	Chalk & Talk, PPT.
		3.2	Permutations with Repetitions	T1, T2, T3, R1	1	Chalk & Talk
		3.3	Circular and Restricted Permutations	T1, T2, T3, R1	1	PPT.
		3.4	Combinations, Restricted Combinations	T1, T2, T3, R1	1	Chalk & Talk
		3.5	Binomial and Multinomial Coefficients and Theorems	T1, T2, R1	1	Chalk & Talk
		3.6	**Recurrence Relations**: Generating Functions	T1, T2, T3, R1	1	Chalk & Talk
		3.7	Function of Sequences, Partial Fractions	T1, T2, R1	1	Chalk & Talk
		3.8	Calculating Coefficient of Generating Functions	T1, T2, R1	1	Chalk & Talk PPT
		3.9	Recurrence Relations, and Formulation as Recurrence Relations	T1, T2, T3, R1	1	Chalk & Talk Tutorials
		3.10	Solving Recurrence Relations by Substitution and Generating Functions	T1, T2, R1, R3	1	Chalk & Talk
		3.11	Method of Characteristic Roots	T1, T2, T3, R1	1	Chalk & Talk PPT
		3.12	Solving Inhomogeneous Recurrence Relations	T1, T2, T3, R1, R2	1	Chalk & Talk Tutorials
4	**CO4:** Manipulate and analyze data numerically and/or graphically appropriate Software. (K3)		**UNIT–IV: GRAPH THEORY**			
		4.1	Basic Concepts	T1, T2, R1	1	Chalk & Talk, PPT.
		4.2	Graph Theory and its Applications	T1, T2, R1	1	Chalk & Talk
		4.3	Subgraphs	T1, T2, R1	1	Chalk & Talk Students Seminars
		4.4	Graph Representations	T1, T2, R1	1	Chalk & Talk, Tutorials

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		4.5	Adjacency and Incidence Matrices	T1, T2, R1	1	Chalk & Talk, Tutorials
		4.6	Isomorphic Graphs	T1, T2, R1, R3	1	Chalk & Talk
		4.7	Isomorphic Graphs	T1, T2, R1, R2	1	Chalk & Talk
		4.8	Paths and Circuits	T1, T2, R1, R3	1	Chalk & Talk PPT
		4.9	Paths and Circuits			
		4.10	Eulerian and Hamiltonian Graphs	T1, T2, R1, R2	1	Chalk & Talk
		4.11	Eulerian and Hamiltonian Graphs	T1, T2, R1, R2	1	Chalk & Talk
		4.12	Eulerian and Hamiltonian Graphs	T1, T2,R1, R2	1	Chalk & Talk PPT
ASSIGNMENT-II EXAMINATION						
		UNIT – V: MULTI GRAPHS				
5	**CO5:** to communicate effectively mathematical ideas/results verbally or in writing. (K1)	5.1	Multigraphs	T1, T2, R1	1	Chalk & Talk PPT
		5.2	Bipartite and Planar Graphs	T1, T2, R1	1	Chalk & Talk, Tutorials
		5.3	Bipartite and Planar Graphs	T1, T2, R1	1	Chalk & Talk
		5.4	Euler's Theorem	T1, T2, R1	1	Chalk & Talk
		5.5	Euler's Theorem	T1, T2, R1	1	Chalk & Talk
		5.6	Graph Colouring and Covering	T1, T2,R1, R3	1	Chalk & Talk PPT
		5.7	Chromatic Number	T1, T2,R1, R3	1	Chalk & Talk
		5.8	Spanning Trees	T1, T2,R1, R3	1	Chalk & Talk
		5.9	Prim's and Kruskal's Algorithms	T1, T2,R1, R2	1	Chalk & Talk
		5.10	Prim's and Kruskal's Algorithms	T1, T2,R1, R2	1	Chalk & Talk PPT
		5.11	BFS and DFS Spanning Trees.	T1, T2,R1, R3	1	Chalk & Talk
		5.12	BFS and DFS Spanning Trees.	T1, T2,R1, R3	1	Chalk & Talk
			MID-II EXAMINATION			
TOTAL:60						

Text Books:

1. Discrete Mathematical Structures with Applications to Computer Science, J. P. Tremblay and P. Manohar, Tata McGraw Hill.
2. Elements of Discrete Mathematics-A Computer Oriented Approach, C. L.Liu and D. P. Mohapatra, 3rd Edition, Tata McGraw Hill.
3. Theory and Problems of Discrete Mathematics, Schaum's Outline Series, Seymour Lipschutz and Marc Lars Lipson, 3rd Edition, McGraw Hill.

Refrences:

1. Discrete Mathematics for Computer Scientists and Mathematicians, J. L.Mott, A. Kandel and T. P. Baker, 2nd Edition, Prentice Hall of India publishers.
2. Discrete Mathematics, S. K. Chakraborthy and B. K. Sarkar, Oxford press, 2011.
3. Discrete Mathematics and its Applications with Combinatorics and GraphTheory, K.H. Rosen, 7th Edition, Tata McGraw Hill.

WEB SOURCE REFERENCES:

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1	https://nptel.ac.in/downloads/106106094/
2	https://nptel.ac.in/courses/106108054 (Graph theory)
3	https://onlinecourses.nptel.ac.in/noc18_ma16/unit?unit=18&lesson=19
4	https://onlinecourses.nptel.ac.in/noc18_ma16/student/home
5	https://onlinecourses.nptel.ac.in/noc18_cs53/student/home

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DEPARTMENT OF IT & CSE (AI)
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
-	UHV-2(R23)	II-I	IT	3	

COURSE OUTCOMES: Student is able to

CO1: : Define the terms like Natural Acceptance, Happiness and Prosperity (K1)

CO2: Identify one's self, and one's surroundings (family, society nature) (K4)

CO3: Apply what they have learnt to their own self in different day-to-day settings in real life (K3)

CO4: Relate human values with human relationship and human society. (K6)

CO5: Justify the need for universal human values and harmonious existence (K5)

CO6: Develop as socially and ecologically responsible engineers.(K6)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Define the terms like Natural Acceptance, Happiness and Prosperity		**Unit-1. Introduction to Value Education**			
		1.1	Right Understanding, Relationship and Physical Facility	T1,R1	1	Chalk & Talk
		1.2	Understanding Value Education	T1R1	1	Chalk & Talk,PPT
		1.3	Practice Session PS1 Sharing about Oneself (PS1)	T1, R1	1	Presentation by student
		1.4	Self-exploration as the Process for Value Education	T1,R1	1	Chalk & Talk
		1.5	Continuous Happiness and Prosperity – the Basic Human Aspirations	T1,R1	1	Chalk & Talk,PPT
		1.6	Practice Session PS2 Exploring Human Consciousness(PS2)	T1,R1	1	Presentation by student
		1.7	Happiness and Prosperity – Current Scenario	T1,R1	1	Chalk & Talk,PPT
		1.8	Method to Fulfill the Basic Human Aspirations	T1,R1	1	Chalk & Talk,PPT
		1.9	Practice Session PS3 Exploring Natural Acceptance(PS3)	T1,R1	1	Presentation by student
2	CO2: Identify one's self, and one's surroundings		**Unit-2. Harmony in the Human Being**			
		2.1	Understanding Human being as the Co-existence of the self and the body	T1, R1	1	Chalk & Talk,PPT

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	(family, society nature)	2.2	Distinguishing between the Needs of the self and the body	T1, R1	1	Chalk & Talk
		2.3	Practice Session PS4 Exploring the difference of Needs of self and body.(PS4)	T1, R1	1	Chalk & Talk,PPT
		2.4	The body as an Instrument of the self	T1, R1	1	Chalk & Talk
		2.5	Practice Session PS5 Exploring Sources of Imagination in the self (PS5)	T1, R1	1	Presentation by student
		2.6	Harmony of the self with the body	T1, R1	1	Chalk & Talk
		2.7	Programme to ensure self-regulation and Health	T1, R1	1	Chalk & Talk
		2.8	Session PS6 Exploring Harmony of self with the body	T1, R1	1	Presentation by student
3	CO3: Apply what they have learnt to their own self in different day-to-day settings in real life.		**Unit-3. Harmony in the Family and Society**			
		3.1	Harmony in the Family – the Basic Unit of Human Interaction	T1, R1	1	Chalk & Talk
		3.2	Trust' – the Foundational Value in Relationship	T1, R1	1	Chalk & Talk,PPT
		3.3	Practice Session PS7 Exploring the Feeling of Trust	T1, R1	1	Presentation by student
		3.4	Respect – as the Right Evaluation	T1, R1	1	Chalk & Talk
		3.5	Practice Session PS8 Exploring the Feeling of Respect	T1, R1	1	Presentation by student
		3.6	Other Feelings, Justice in Human-to-Human Relationship	T1, R1	1	Chalk & Talk
		3.7	Understanding Harmony in the Society	T1, R1	1	Chalk & Talk
		3.8	Vision for the Universal Human Order	T1, R1	1	Chalk & Talk
		3.9	Practice Session PS9 Exploring Systems to fulfil Human Goal	T1, R1	1	Presentation by student

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		MID I EXAMINATION				
4	CO4:Relate human values with human relationship and human society, Justify the need for universal human values and harmonious existence	**Unit-4 Harmony in the Nature/Existence**				
		4.1	Understanding Harmony in the Nature	T1,R1	1	Chalk & Talk
		4.2	Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature	T1,R1	1	Chalk & Talk
		4.3	Practice Session PS10 Exploring the Four Orders of Nature	T1,R1	1	Presentation by student
		4.4	Realizing Existence as Co-existence at All Levels	T1,R1	1	Chalk & Talk
		4.5	The Holistic Perception of Harmony in Existence	T1,R1	1	Chalk & Talk
		4.6	Practice Session PS11 Exploring Co-existence in Existence	T1,R1	1	Presentation by student
5	CO5: Justify the need for universal human values and harmonious existence, Develop as socially and ecologically responsible engineers	**Unit 5. Implications of the Holistic Understanding – a Look at Professional Ethics**				
		5.1	Natural Acceptance of Human Values	T1,R1	1	Chalk & Talk
		5.2	Definitiveness of (Ethical) Human Conduct	T1,R1	1	Chalk & Talk
		5.3	Practice Session PS12 Exploring Ethical Human Conduct	T1,R1	1	Presentation by student
		5.4	A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order	T1,R1	1	Chalk & Talk
		5.5	Competence in Professional Ethics	T1,R1	1	Chalk & Talk
		5.6	Practice Session PS13 Exploring Humanistic Models in Education	T1,R1	1	Presentation by student
		5.7	Holistic Technologies, Production Systems and Management Models-Typical Case Studies	T1,R1	1	Chalk & Talk

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	5.8	Strategies for Transition towards Value-based Life and Profession	T1,R1	1	Chalk & Talk
	5.9	Practice Session PS14 Exploring Steps of Transition towards Universal Human Order	T1,R1	1	Presentation by student
			Total	42	
MID II EXAMINATION DURING SIXTEENTH WEEK					
END EXAMINATIONS					

Textbook:

1.R R Gaur, R Asthana, G P Bagaria, a Foundation Course in Human Values and Professionals, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1.

Reference:

1. JeevanVidya: EkParichaya, A Nagaraj, JeevanVidya Prakashan, Amarkantak, 1999.

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DEPARTMENT OF INFORMATION TECHNOLOGY
LESSON PLAN

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R23CC2205	SOFTWARE ENGINEERING (R23)	II/II	IT	5	A,B

COURSE OUTCOMES:

After completion of this course, the students would be able to

CO 1: Analyze Software Life Cycle models. [K4]
CO 2: Analyze the importance of software requirement and project management [K4]
CO 3: Analyze various types of software design techniques [K4]
CO 4: Analyze Software testing and quality management [K4].
CO 5: Analyze various CASE tools and software maintenance process models. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO 1:** Analyze Software Life Cycle models. **[K4]**		**Unit-1**			
		1.1	**Introduction:** Evolution, Software development projects	T1	1	Chalk & Talk + Hands-On
		1.2	Exploratory style of software developments	T1	1	Chalk & Talk + Hands-On
		1.3	Emergence of software engineering, Notable changes in software development practices	T1	1	Chalk & Talk + Hands-On
		1.4	Computer system engineering.	T1	1	Chalk & Talk + Hands-On
		1.5	**Software Life Cycle Models:** Basic concepts	T1	1	Chalk & Talk + Hands-On
		1.6	Waterfall model and its extensions	T1	1	Chalk & Talk + Hands-On
		1.7	Rapid application development	T1	1	PPT
		1.8	Agile development model, Spiral model.	T1	1	Chalk & Talk + Hands-On
2	**CO 2:** Analyze the importance of software requirement and project management [K4]		**Unit-2**			
		2.1	**Software Project Management:** Software project management complexities	T1, T2	1	Chalk & Talk + Hands-On
		2.2	Responsibilities of a software project manager	T1, T2	1	Chalk & Talk + Hands-On

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		2.3	Metrics for project size estimation	T1, T2	1	Chalk & Talk + PPT
		2.4	Project estimation techniques	T1, T2	1	Chalk & Talk + Hands-On
		2.5	Empirical Estimation techniques	T1, T2	1	Chalk & Talk + Hands-On
		2.6	COCOMO	T1, T2	1	PPT
		2.7	Halstead's software science,	T1, T2	1	Chalk & Talk + Hands-On
		2.8	risk management	T1, T2	1	Chalk & Talk + Hands-On
		2.9	**Requirements Analysis And Specification:** Requirements gathering and analysis	T1, T2	1	Chalk & Talk + Hands-On
		2.10	Software Requirements Specification (SRS)	T1, T2	1	Chalk & Talk + Hands-On
		2.11	Formal system specification, Axiomatic specification	T1, T2	1	Chalk & Talk + Hands-On
		2.12	Algebraic specification, Executable specification and 4GL.	T1, T2	1	Chalk & Talk + Hands-On
MID I EXAMINATION						
Unit-3						
3	**CO 3:** Analyze various types of software design techniques [K4]	3.1	**Software Design:** Overview of the design process, How to characterize a good software design?	T1, T2	1	Chalk & Talk Project Based Learning.
		3.2	Layered arrangement of modules	T1, T2	1	PPT
		3.3	Cohesion and Coupling.	T1, T2	1	Chalk & Talk + Hands-On
		3.4	Approaches to software design.	T1, T2	1	Chalk & Talk + Hands-On
		3.5	**Agility:** Agility and the Cost of Change	T1, T2	1	Chalk & Talk + Hands-On
		3.6	Agile Process	T1, T2	1	Chalk & Talk + Hands-On
		3.7	Extreme Programming (XP)	T1, T2	1	Chalk & Talk + Hands-On
		3.8	**Function-Oriented Software Design:** Overview of SA/SD methodology	T1, T2	1	Chalk & Talk + Hands-On

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		3.9	Structured analysis	T1, T2	1	Chalk & Talk + Hands-On
		3.10	Developing the DFD model of a system	T1, T2	1	Chalk & Talk + Hands-On
		3.11	Structured design, Detailed design, and Design Review.	T1, T2	1	Chalk & Talk + Hands-On
		3.12	**User Interface Design:** Characteristics of a good user interface	T1, T2	1	Chalk & Talk + Hands-On
		3.13	Basic concepts, Types of user interfaces	T1, T2	1	Chalk & Talk + Hands-On
		3.14	Fundamentals of component-based GUI development	T1, T2	1	Chalk & Talk + Hands-On
		3.15	user interface design methodology	T1, T2	1	Chalk & Talk + Hands-On
4	**CO 4:** Analyze Software testing and quality management [K4].		**Unit-4**			
		4.1	**Coding And Testing:** Coding, Code review , Software documentation	T1, T2	1	Chalk & Talk
		4.2	Testing, Black-box testing, White-Box testing	T1, T2	1	Chalk & Talk
		4.3	Debugging, Program analysis tools	T1, T2	1	PPT
		4.4	Integration testing, Testing object-oriented programs	T1, T2	1	Chalk & Talk + Hands-On
		4.5	Smoke testing, and Some general issues associated with testing.	T1, T2	1	Chalk & Talk + Hands-On
		4.6	**Software Reliability And Quality Management:** Software reliability. Software quality	T1, T2	1	Chalk & Talk + Hands-On
		4.7	Software quality management system	T1, T2	1	Chalk & Talk + Hands-On
		4.8	ISO 9000.SEI Capability maturity model.	T1, T2	1	Chalk & Talk + Hands-On
5	**CO 5:** Analyze various CASE tools and software maintenance process models. [K4]		**Unit-5**			
		5.1	**Computer-Aided Software Engineering (Case):** CASE and its scope	T1, T2	1	Chalk & Talk + Hands-On
		5.2	CASE environment, CASE support in the software life cycle.	T1, T2	1	PPT
		5.3	**Software Maintenance:** Characteristics of software maintenance	T1, T2	1	Chalk & Talk + Hands-On
		5.4	Software reverse engineering , Software maintenance process models	T1, T2	1	Chalk & Talk + Hands-On

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		5.5	Estimation of maintenance cost.	T1, T2	1	Chalk & Talk + Hands-On
				Total	48	
MID II EXAMINATION						
END EXAMINATIONS						

Activity Plan for Term Work:

S.No	Topic/Activity	Term Work Component	Planned Hours
1.	➢ Waterfall model ➢ COCOMO ➢ Software Requirements Specification (SRS) ➢ Agile Process	Seminar	9
2.	• Black-box testing • White-Box testing	Collaborative Learning, Hands-On or Any other learning Activity	8
3.	• Good user interface • CASE support in the software life cycle	PPT Presentations	4
4.	Software maintenance process models	Developing Projects	6
5.	Sliptest	Sliptest	5
6.	Exploring online tutorials on Software Testing and Software Engineering	Online learning platforms **(MOOCs (Massive Open Online Courses), Edureka, Coursera** and **Infosys Springboard / Any other online learning activity.**	10
			Total No. of Hours : 42

Text Books:	
T1	Fundamentals of Software Engineering, Rajib Mall, 5th Edition,PHI
T2	Software Engineering A practitioner's Approach, Roger S. Pressman, 9 th Edition, McGraw Hill International Edition.
Reference Books:	
R1	Software Engineering, Ian Sommerville,10thEdition, Pearson.
R2	SoftwareEngineering, PrinciplesandPractices, Deepak Jain, Oxford University Press.

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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601**

DEPARTMENT OF INFORMATION TECHNOLOGY

LESSON PLAN

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R23CC2204	DATABASE MANAGEMENT SYSTEM (R23)	II/II	IT	5	A,B

LESSON PLAN

COURSE OUTCOMES

After completion of the course, the students would be able to:

CO 1: Interpret the fundamentals of DBMS. [K2]
CO 2: Analyze relational database designing. [K4]
CO 3: Develop queries in RDBMS [K3]
CO 4: Analyze database design methodology and normalization process [K4].
CO 5: Analyze transaction concepts and File indexing. [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
Unit-1						
1	**CO 1:** Interpret the fundamentals of DBMS. [K2]	1.1	Introduction: Database system	T1, T2	2	Chalk & Talk + PPT
		1.2	Characteristics (Database Vs File System)	T1, T2	2	Chalk & Talk
		1.3	Database Users, Advantages of Database systems, Database applications.	T1, T2	2	Chalk & Talk + PPT
		1.4	Brief introduction of different Data Models; Concepts of Schema, Instance and data independence;	T1, T2	2	Chalk & Talk + PPT
		1.5	Three tier schema architecture for data independence;	T1, T2	2	Chalk & Talk + PPT
		1.6	Database system structure, environment, Centralized and Client Server architecture for the database.	T1, T2	2	Chalk & Talk + PPT
		1.7	Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set	T1, T2	1	Chalk & Talk + PPT
		1.8	constraints, sub classes, super class, inheritance, specialization, generalization using ER Diagrams.	T1, T2	2	Chalk & Talk + PPT

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Unit-2						
2	**CO2:**Analyze relational database designing. [K4]	2.1	Relational Model: Introduction to relational model, concepts of domain, attribute, tuple, relation, importance of null values	T1, T2	2	Chalk & Talk + PPT
		2.2	constraints (Domain, Key constraints, integrity constraints) and their importance,	T1	2	Chalk & Talk + PPT
		2.3	Relational Algebra, Relational Calculus	T1	2	Chalk & Talk + PPT
		2.4	BASIC SQL: Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update).	T1	2	Chalk & Talk + PPT
Unit-3						
3	CO3:Develop queries in RDBMS [K3]	3.1	SQL: Basic SQL querying (select and project) using where clause, arithmetic & logical operations	T1	2	Chalk & Talk
		3.2	SQL functions (Date and Time, Numeric, String conversion). Creating tables with relationship	T1	1	PPT
		3.3	Implementation of key and integrity constraints, nested queries, sub queries	T1	2	Chalk & Talk
		3.4	grouping, aggregation, ordering	T1	1	Chalk & Talk
		3.5	Implementation of different types of joins, view(updatable and non-updatable), relational set operations.	T1	2	Chalk & Talk
Unit-4						
4	**CO4:** Analyze database design methodology and normalization process [K4].	4.1	Schema Refinement (Normalization):Purpose of Normalization or schema refinement	T1, T2	2	Chalk & Talk + PPT
		4.2	concept of functional dependency,	T1, T2	3	Chalk & Talk
		4.3	Normal forms based on functional dependency Lossless join and dependency preserving decomposition	T1, T2	2	Chalk & Talk + PPT
		4.4	1NF,2NFand 3NFconcept of surrogate key, Boyce-Codd normal form(BCNF), MVD, Fourth normal form(4NF), Fifth Normal Form (5NF).	T1, T2	1	Chalk & Talk

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			Normal Form (5NF).			
Unit-5						
5	**CO5:**Analyze transaction concepts and File indexing. [K2]	5.1	Transaction Concept: Transaction State, ACID properties	T1, T2	1	Chalk & Talk
		5.2	Concurrent Executions, Serializability, Recoverability	T1, T2	2	Chalk & Talk + PPT
		5.3	Implementation of Isolation, Testing for Serializability, lock based, time stamp based	T1, T2	2	Chalk & Talk
		5.4	optimistic, concurrency protocols, Deadlocks, Failure Classification, Storage, Recovery and Atomicity, Recovery algorithm.	T2	2	PPT
		5.5	Introduction to Indexing Techniques: B+ Trees, operations on B+Trees, Hash Based Indexing:	T2	2	PPT
				Total	48	

Activity Plan for Term Work:

S.No	Topic/Activity	Term Work Component	Planned Hours
1	1NF, 2NF and 3 Concept of surrogate key, Boyce- Codd normal form(BCNF), MVD, Fourth normal form(4NF), Fifth Normal Form (5NF)	Seminar, Hands-On	9
2	BASIC SQL: Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update).	Collaborative Learning, Hands-On or Flipped learning Activity	8
3	BASIC SQL: Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update).	Project based learning, Collaborative Learning, Hands-On with SQLDATABASE	5
4	Sliptest	Sliptest	10
5	Exploring online tutorials and courses on SQL	Online learning platforms **(MOOCs (Massive Open Online Courses), Edureka, Coursera** and **Infosys Springboard / online learning activity.**	10
Total No. of Hours : 42			

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	Text Books:
T1	Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
T2	Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)
	Reference Books:
R1	Introduction to Database Systems, 8thedition, C J Date, Pearson.
R2	Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson
R3	Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.
	Web Resources:
1	https://nptel.ac.in/courses/106/105/106105175/
2	https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012758066672820 22456_shared/overview

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NARASARAOPETA ENGINEERING COLLEGE
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DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2201	Probability and Statistics	II-II	I.T	5	A,B

Course Outcomes:

After completion of this course, the students would be able to:

CO221.1	Classify the concept of data science and its importance	(K2)
CO221.2	Interpret the association of characteristics and through correlation and regression tools	(K4)
CO221.3	Apply discrete and continuous probability distributions	(K3)
CO221.4	Design the components of a classical hypothesis test	(K6)
CO221.5	Infer the statistical internal methods based on small and large sample tests	(K4)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO-1: Classify the concept of data science and its importance (K2).		**UNIT-I : Descriptive Statistics and methods for data science**			
		1.1	Introduction to Data science	T1, T2, R1	1	Chalk & Talk PPT
		1.2	Population Vs sample, collection of Data	T1, T2, R1	1	Chalk & Talk
		1.3	Types of Variables	T1, T2, R1	1	Chalk & Talk
		1.4	Data Visualization charts	T1, T2, R2	1	Chalk & Talk
		1.5	Mean, median,, mode	T1, T2, R1	1	Chalk & Talk
		1.6	Geometric mean, Harmonic mean	T1, T2, R1	1	Chalk & Talk
		1.7	Range, variance,	T1, T2, R1	1	Chalk & Talk
		1.8	Mean & deviation	T1, T2, R1	1	Chalk & Talk
		1.9	Skewness	T1, T2, R1	1	Chalk & Talk
		1.10	kurtosis	T1, T2, R1	1	Chalk & Talk
		ASSIGNMENT-I EXAMINATION				
2	CO-2: Interpret the association of characteristics and through correlation and regression tools (K4).		**UNIT – II: CORRELATION AND CURVE FITTING**			
		2.1	Types of correlation	T1, T2,R1	1	Chalk & Talk PPT
		2.2	Coefficient of correlation	T1, T2,R1	1	Chalk & Talk,
		2.3	Rank correlation coefficient	T1, T2,R1	1	Chalk & Talk,
		2.4	Regression Coefficient and Regression Equation	T1, T2,R1	1	Chalk & Talk
		2.5	Multiple linear Regression	T1, T2,R1	1	Chalk & Talk
		2.6	Fitting a straight Line-Method of least squares	T1, T2,R1	1	Chalk & Talk
		2.7	Fitting a Parabola	T1, T2,R1	1	Chalk & Talk
		2.8	Fitting a Exponential curve	T1, T2,R2	1	Chalk & Talk,
		2.9	Fitting a Power Curve	T1, T2,R1	1	Chalk & Talk
		MID-I EXAMINATION				
		UNIT-III :Probability Distributions				

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3	CO-3: Apply discrete and continuous probability distributions (K3).	3.1	Introduction to Probability	T1, T2, R1	1	Chalk & Talk PPT
		3.2	Conditional Probability, aye's theorem	T1, T2, R1	1	Chalk & Talk
		3.3	Discrete Random Variables	T1, T2, R1	1	Chalk & Talk,
		3.4	Continuous Random variables	T1, T2, R3	1	Chalk & Talk,
		3.5	Distribution function	T1, T2, R1	1	Chalk & Talk
		3.6	Mathematical expectation	T1, T2, R1	1	Chalk & Talk,
		3.7	variance	T1, T2, R1	1	Chalk & Talk
		3.8	Binomial distribution	T1, T2, R3	1	Chalk & Talk Student seminar
		3.9	Poisson and uniform distribution	T1, T2, R1	1	Chalk & Talk
		3.10	Normal Distribution	T1, T2, R1	1	Chalk & Talk
			ASSIGNMENT-II EXAMINATION			
4	CO-4: Design the components of a classical hypothesis test (K6).		**UNIT-IV :SAMPLING THEORY**			
		4.1	Introduction to Sampling Theory	T1, T2,R1	1	Chalk & Talk, PPT
		4.2	Population Vs sample	T1, T2,R1	1	Chalk & Talk
		4.3	Sampling distribution of means	T1, T2,R1	1	Chalk & Talk
		4.4	Sampling distribution of variances	T1, T2,R1	1	Chalk & Talk
		4.5	Central Limit theorem	T1, T2,R1	1	Chalk & Talk
		4.6	Introduction to t distribution	T1, T2,R1	1	Chalk & Talk
		4.7	Point Estimation	T1, T2,R2	1	Chalk & Talk
		4.8	Interval Estimation	T1, T2,R1	1	Chalk & Talk,
		4.9	Maximum error of estimate	T1, T2,R1	1	Chalk & Talk
5	CO-5: Infer the statistical internal methods based on small and large sample tests (K4).		**UNIT-V: TESTING OF HYPOTHESIS**			
		5.1	Introduction to Tests of Hypothesis	T1, T2, R1	1	Chalk & Talk, PPT
		5.2	Formulation of Null Hypothesis, critical region, level of significance	T1, T2,R1	1	Chalk & Talk
		5.3	One Tail, Two tailed Tests Type-I, and Type-II errors	T1, T2,R1	1	Chalk & Talk Tutorial
		5.4	Large sample test -single mean	T1, T2,R1	1	Chalk & Talk
		5.5	Large sample test, two means	T1, T2,R1	1	Chalk & Talk
		5.6	Large sample test -single proportion	T1, T2,R1	1	Chalk & Talk
		5.7	Large sample test -Double proportion	T1, T2,R1	1	Chalk & Talk
		5.8	Small samples-Students t Test	T1, T2,R1	1	Chalk & Talk
		5.9	F-Test	T1, T2,R4	1	Chalk & Talk, web resources
		5.10	Chi Square Test	T1, T2,R1	1	Chalk & Talk Student seminar
			MID-II EXAMINATION			
						TOTAL:48

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S.No	Topic/Activity	Term Work Component	Planned Hours
1	Types of variables, Data Visualization charts, Skewness, kurtosis, Distribution function, Sampling distribution of means and variance.	Seminar	12
2	Coefficient of correlation, Conditional Probability, Introduction to t distribution, f distribution, Chi Square distribution,	Flipped Learning	8
3	Slip test	Slip test	10
4	Mean deviation, S.D, Fitting a Parabola, Normal Distribution, Tests of Hypothesis	Problem Solving	12
Total No. of Hours : 42			

Text Books:

1.Miller and Freund's, "Probability and Statistics for Engineers",7/e, Pearson, 2008.
2.S. C. Gupta and V.K. Kapoor, "Fundamentals of Mathematical Statistics", 11/e, Sultan Chand & Sons Publications, 2012.

References:

1.Shron L. Myers, Keying Ye, Ronald E Walpole, Probability and Statistics Engineers and the Scientists,8th Edition, Pearson 2007.
2. Jay l. Devore, Probability and Statistics for Engineering and the Sciences, 8 th Edition, cengage.
3. Sheldon M. Ross, "Introduction to probability and statistics Engineers and the Scientists", 4 th Edition, Academic Foundation, 2011.
4.Johannes Ledolter and Robert V. Hogg, "Applied statistics for Engineers and Physical Scientists", 3 rd Edition, Pearson, 2010.

WEB SOURCE REFERENCES:

1	https://archive.nptel.ac.in/courses/111/105/111105090/
2	https://onlinecourses.nptel.ac.in/noc21_ma74/preview
3	https://archive.nptel.ac.in/courses/111/106/111106112/
4	https://archive.org/details/NPTEL-Math-Probability_and_Statistics
5	https://onlinecourses.nptel.ac.in/noc22_ma81/preview

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DEPARTMENT OF INFORMATION TECHNOLOGY
LESSON PLAN AY: 2024-25

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R23CC2203	OPERATING SYSTEMS	II/II	IT	5	A & B

After completion of this course the student should be able to

CO	Course Outcome Statement
CO1	Classify various operating system generations, functions and services. [K2]
CO2	Analyze process scheduling, management and synchronization. [K4]
CO3	Analyze deadlock prevention, detection, avoidance and recovery techniques [K4]
CO4	Analyze various memory management and storage management techniques [K4]
CO5	Analyze the concepts of file system [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1 Classify various operating system generations, functions and services. [K2]		**Unit-1**			
		1.1	Operating Systems Overview	T1,T2	1	Chalk & Talk
		1.2	Operating Systems Introduction	T1,T2	1	Chalk & Talk
		1.3	Operating system functions	T1,T2	1	Chalk & Talk
		1.4	Operating systems operations	T1,T2	1	Chalk & Talk
		1.5	Computing environments, Free and Open-Source Operating Systems	T1,T2	1	Chalk & Talk
		1.6	Operating System Services, User and Operating-System Interface	T1,T2	1	Chalk & Talk
		1.7	System calls, Types of system calls	T1,T2	1	Chalk & Talk
		1.8	System Programs	T1,T2	1	Chalk & Talk
		1.9	Operating system Design and Implementation, Operating System structures	T1,T2 T1,T2	1	Chalk & Talk PPT
		1.10	Building and Booting an Operating System, Operating system debugging	T1,T2	1	Chalk & Talk
			ASSIGNMENT- I			
2	CO 2 Analyze process scheduling, management and synchronization. [K4]		**Unit-2**			
		2.1	Process Concept	T1,T2	1	Chalk & Talk
		2.2	Process scheduling	T1,T2	1	Chalk & Talk
		2.3	Operations on processes	T1,T2	1	Chalk & Talk
		2.4	Inter-process communication	T1,T2 T1,T2	1	Chalk & Talk PPT
		2.5	Thread libraries	T1,T2	1	Chalk & Talk PPT

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		2.6	Threading issues	T1,T2	1	Chalk & Talk
		2.7	Basic concepts, Scheduling criteria	T1,T2	1	Chalk & Talk
		2.8	Scheduling algorithms	T1,T2	1	Chalk & Talk
		2.9	Multiple processor scheduling	T1,T2	1	Chalk & Talk
	MID I EXAMINATION					
3	**CO 3** Analyze deadlock prevention, detection, avoidance and recovery techniques [K4]	**Unit-3**				
		3.1	The Critical Section Problem	T1,T2	1	Chalk & Talk
		3.2	Peterson's Solution	T1,T2	1	Chalk & Talk
		3.3	Mutex Locks, Semaphores	T1,T2	1	Chalk & Talk
		3.4	Monitors, Structured analysis	T1,T2	1	Chalk & Talk
		3.5	Classic problems of Synchronization	T1,T2	1	Chalk & Talk PPT
		3.6	System Model, Deadlock characterization	T1,T2 T1,T2	1	Chalk & Talk
		3.7	Methods for handling Deadlocks,	T1,T2 T1,T2	1	Chalk & Talk
		3.8	Deadlock avoidance	T1,T2	1	Chalk & Talk
		3.9	Deadlock detection	T1,T2	1	Chalk & Talk
		3.10	Recovery from Deadlock	T1,T2	1	Chalk & Talk
	ASSIGNMENT- II					
4	**CO 4** Analyze various memory management and storage management techniques [K4]	**Unit-4**				
		4.1	Memory-Management Introduction	T1,T2	1	Chalk & Talk
		4.2	Contiguous memory allocation	T1,T2	1	Chalk & Talk
		4.3	White-Box testing, Debugging	T1,T2	1	Chalk & Talk
		4.4	Paging, Structure of the Page Table	T1,T2 T1,T2	1	Chalk & Talk PPT
		4.5	Smoke testing, and Some general issues associated with testing.	T1,T2	1	Chalk & Talk
		4.6	Virtual Memory Management Introduction	T1,T2 T1,T2	1	Chalk & Talk
		4.7	Demand paging, Copy-on-write	T1,T2 T1,T2	1	Chalk & Talk PPT
		4.8	Page replacement	T1,T2	1	Chalk & Talk
5	**CO 5** Analyze the concepts of file system [K2]	**Unit-5**				
		5.1	Overview of Mass Storage Structure	T1,T2	1	Chalk & Talk
		5.2	HDD Scheduling	T1,T2	1	Chalk & Talk
		5.3	File concept, Access methods	T1,T2	1	Chalk & Talk
		5.4	Directory Structure	T1,T2	1	Chalk & Talk PPT
		5.5	File-system structure	T1,T2	1	Chalk & Talk
		5.6	File-system Operations	T1,T2	1	Chalk & Talk
		5.7	Directory implementation	T1,T2	1	Chalk & Talk
		5.8	Allocation method	T1,T2	1	Chalk & Talk
		5.9	Free space management	T1,T2	1	Chalk & Talk
		5.10	File- System Mounting	T1,T2	1	Chalk & Talk PPT
		5.11	Partitions and Mounting, File Sharing	T1,T2	1	Chalk & Talk

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MID II EXAMINATION	
END EXAMINATIONS	
	Total No. of Hours: 48

Activity Plan for Term Work:

S.No	Topic/Activity	Term Work Component	Planned Hours
1.	1. Fork(), wait() System calls 2. Process Life cycle 3. Co-operative Process Communication 4. Page fault Handling in operating systems Bankers algorithm	Seminar	5
2.	1. Operating system generations 2. Round Robin Scheduling algorithm How to characterize a good operating system design?	Collaborative Learning/ Virtual Labs/ Active Learning or Any other learning Activity	5
3.	1. CPU scheduling algorithms 2, Disk Scheduling algorithms	Flipped Learning	5
4.	Make a simple Operating System	Micro Project	12
5.	Slip test	Slip test	5
6.	Operating System Design, Causes of Operating Systems Failure.	Online learning platforms (MOOCs (Massive Open Online Courses), NPTEL, and Infosys Springboard)/ Any other online learning activity.	10
			Total No. of Hours: 42

Text Book:

T1: Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018.

T2: Modern Operating Systems, Tanenbaum A S, 4 th Edition, Pearson , 2016

Reference Book:

R1: Operating Systems -Internals and Design Principles, Stallings W, 9 th edition, Pearson, 2018

R2: Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3 rd Edition, McGraw- Hill, 2013

WEB RESOURCES:

W1: https://nptel.ac.in/courses/106/106/106106144/

W2: https://peterindia.net/OperatingSystems.html

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1 Month late

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DEPARTMENT OF INFORMATION TECHNOLOGY
LESSON PLAN 2024-25

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R23CC2208	OPTIMIZATION TECHNIQUES)	II/II	IT	4	A&B

COURSE OUTCOMES: Students are able to

SNO	Course Outcome Statement
CO1	**Formulate** the optimization problem, without and with constraints, by using design variables from an engineering design problem **(K6)**
CO2	**Apply** classical optimization techniques to minimize or maximize a multi-variable Objective function, without or with constraints, and arrive at an optimal solution. **(K3)**
CO3	**Apply** and Solve transportation and assignment problem by using Linear programming Simplex method. **(K3)**
CO4	**Apply** gradient and non-gradient methods to nonlinear optimization problems and use Interior or exterior penalty functions for the constraints to derive the optimal solutions. **(K3)**
CO5	**Formulate** Dynamic programming technique to inventory control, production planning, Engineering design problems etc. to reach a final optimal solution from the current optimal solution. **(K6)**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: **Formulate** the optimization problem, without and with constraints, by using design variables from an engineering design problem (K6)		**UNIT– I**			
		1.1	Statement of an Optimization problem	T1, T2, R1	1	Chalk, Talk & PPT
		1.2	design vector, design constraints, constraint surface	T1, T2, R1	1	Chalk & Talk
		1.3	Single variable Optimization, multivariable Optimization without constraints	T1, R1	2	Chalk & Talk
		1.4	necessary and sufficient conditions for minimum/maximum,multivariable Optimization with equality constraints	T1, T2, R1	2	Chalk & Talk
		1.5	Solution by method of Lagrange multipliers, multivariable Optimization with inequality constraints, Kuhn – Tucker conditions	T1, T2, R1	2	Chalk & Talk
2	CO2: **Apply** classical optimization techniques to minimize or maximize a multi-variable Objective function, without or with constraints, and arrive at an optimal solution. (K3)		**UNIT-II** Assignment-1			
		2.1	Standard form of a linear programming problem, geometry of linear programming problems	T1, R1	2	Chalk & Talk
		2.2	geometry of linear programming problems,	T1, R1	1	Chalk & Talk
		2.3	solution of a system of linear simultaneous equations, pivotal reduction of a general system of equations,	T1, R1	2	Chalk & Talk
		2.4	Simplex algorithm.	T1, T2, R2	1	Chalk & Talk
	CO3 **Apply** and		**MID I EXAMINATION**			
			UNIT-III			
		3.1	Finding initial basic feasible solution by north –	T1,R2	2	Chalk, Talk

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3	Solve transportation and assignment problem by using Linear programming Simplex method. **(K3)**		west corner rule			
		3.2	least cost method and Vogel's approximation method	T1,R2	1	Chalk, Talk
		3.3	testing for optimality of balanced transportation problems	T1,R2	2	Chalk & Talk
			UNIT-IV Assignment-2			
4	**CO4** **Apply** gradient and non-gradient methods to nonlinear optimization problems and use Interior or exterior penalty functions for the constraints to derive the optimal solutions. (K3)	4.1	Unconstrained cases, One – dimensional minimization methods:	T1, T2,R2	1	Chalk & Talk
		4.2	Classification, Fibonacci method, Univariate method, steepest descent method. Constrained cases	T1, T2,R2	2	Chalk & Talk
		4.3	Classification, Basic approach of Penalty Function method,	T1, R2	2	Chalk & Talk
		4.4	Basic approaches of Interior and Exterior penalty function methods	T1, R2	1	Chalk & Talk
			UNIT V			
5	**CO5** **Formulate** Dynamic programming technique to inventory control, production planning, Engineering design problems etc. to reach a final optimal solution from the current optimal solution. **(K6)**	5.1	Dynamic programming multistage decision processes, types	T1, R3	1	Chalk & Talk
		5.2	concept of sub optimization and the principle of optimality	T1, R3	1	Chalk & Talk
		5.3	computational procedure in dynamic programming	T1, R3	2	Chalk & Talk
		5.4	Examples illustrating the calculus method of solution	T1, R3	2	Chalk & Talk
		5.5	Examples illustrating the tabular method of solution.	T1, R3	1	Chalk & Talk
			TOTAL			**32**
			MID II EXAMINATION			
			END EXAMINATIONS			

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Activity Plan for Term Work:

S.No	Topic/Activity	Term Work Component	Planned Hours
1.	objective function, objective function surfaces	Collaborative Learning	3
2	classification of Optimization problems	Seminar	3
3	Motivation to the simplex method	Seminar	5
4	linear programming, definitions and theorems,	Collaborative Learning	5
5	Special cases in transportation problem.	**Case Study**	4
6	Characteristics of a constrained problem,	**NPTEL**	4
7	Dynamic programming multistage decision processes, types	Collaborative Learning	4
			Total No. of Hours : 28

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Engineering optimization: Theory and practice", Singiresu. S.Rao, New Age International (P) Limited, 3rd enlarged edition, 2013
T2	"Introductory Operations Research", H.S. Kasene& K.D. Kumar, Springer (India), Pvt.LTd.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	"Optimization Methods in Operations Research and systems Analysis", by K.V. Mital and C. Mohan, New Age International (P) Limited, Publishers, 3rd edition, 1996.
R2	Operations Research, Dr.S.D.Sharma, Kedarnath, Ramnath& Co.

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DEPARTMENT OF INFORMATION & TECHNOLOGY
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC32MC1	**EITK (R20)**	**III/I**	IT	**2**	**2**

COURSE OUTCOMES: Student is able to

CO1: Understand the philosophy of Indian Culture [K2]
CO2: Know the Indian languages, Epics Ramayana and Mahabharata [K2]
CO3: Acquire the information about Indian arts and architecture [K2]
CO4: Know the spread of cultural exchange in abroad [K2]
CO5: Know the contributions of scientists in different eras [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Understand the philosophy of Indian Culture [K2]		**Unit-1. Indian Culture: An Introduction**			
		1.1	Characteristics, Significance and Geography of Indian culture	**T1, R1**	2	Chalk & Talk
		1.2	Society in India through ages- Ancient period	**T1, R1**	1	Chalk & Talk
		1.3	Varna and jati, family and marriage in India	**T1, R1**	1	Chalk & Talk
		1.4	Position of women in ancient India	**T1, R1**	1	Chalk & Talk
		1.5	Contemporary period; caste system and communalism	**T1, R1**	1	Chalk & Talk
2	CO2: Know the Indian languages, Epics Ramayana and Mahabharata [K2]		**Unit-2. Indian Languages and Literature**			
		2.1	Evolution of script and languages in India: Harappan Script and Brahmi Script	**T1, R1**	2	Chalk & Talk
		2.2	Short History of the Sanskrit literature: The Vedas, The Brahmanas	**T1, R1**	1	Chalk & Talk
		2.3	Short History of the Sanskrit literature: Upanishads & Sutras	**T1, R1**	1	Chalk & Talk
		2.4	Epics: Ramayana	**T1, R1**	1	Chalk & Talk
		2.5	Epics: Mahabharata	**T1, R1**	1	Chalk & Talk
3	CO3: Acquire the information about Indian arts and architecture [K2]		**Unit-3. Indian Arts and Architecture**			
		3.1	Indian Art & Architecture: Hindu Temple Architecture	**T1, R1**	02	Chalk & Talk
		3.2	Indian Art & Architecture: Buddhist Architecture	**T1, R1**	1	Chalk & Talk
		3.3	Indian Art & Architecture: Medieval Architecture	**T1, R1**	1	Chalk & Talk

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		MID I EXAMINATION				
		3.4	Rise of modern theatre	T1, R1	1	Chalk & Talk
		3.5	Rise of Indian cinema	T1, R1	1	Chalk & Talk
4	CO4: Know the spread of cultural exchange in abroad [K2]	**Unit-4. Spread of Indian Culture Abroad**				
		4.1	Causes, Significance and Modes of Cultural Exchange	T2, R2	02	Chalk & Talk
		4.2	Through Traders, Teachers, Emissaries, Missionaries and Gypsies	T2, R2	02	Chalk & Talk
		4.3	India, Central Asia through ages	T2, R2	1	Chalk & Talk
		4.4	India, Western World through ages	T2, R2	1	Chalk & Talk
5	CO5: Know the contributions of scientists in different eras [K2]	**Unit 5. Education System in India**				
		5.1	Education in ancient, medieval and modern India	T2, R2	2	Chalk & Talk
		5.2	Aims of education, Science of ancient India	T2, R2	1	Chalk & Talk
		5.3	Aims of education, Science of Modern India	T2, R2	1	Chalk & Talk
		5.4	Scientists of ancient India,	T2, R2	1	Chalk & Talk
		5.5	Scientists of Modern India	T2, R2	1	Chalk & Talk
				Total	30	
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

T1 Kapil Kapoor, "Text and Interpretation: The indian tradition" ISBN: 81246033375, 2005

T2 " Science in Samskrit", Samskrita Bharti Publisher , ISBN 13 : 978- 8187276333,2007

Reference Books:

R1 NCERT , "Position Paper On Arts ,Music, Dance Theatre", ISBN 81-7450 494-X,200

R2 The indian tradition by PM Bakshi, Universal law publishing co

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DEPARTMENT OF INFORMATION TECHNOLOGY
LESSON PLAN A.Y: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC3102	Data warehousing and Data Mining	III-I	Information Technology	5	IT

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO 1. Interpret the data mining terminology and types of data to be mined.[K2]
CO 2. Outline the need and importance of preprocessing techniques. [K2]
CO 3. Interpret data warehousing concepts and operations. [K2]
CO 4. Compare and contrast different dominant Data Mining Algorithms. [K2]
CO 5. Analyze the performance Association Rules. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1. Interpret the data mining terminology and types of data to be mined.[K2]		**UNIT-1. Introduction to data mining**			
		1.1	Introduction to data mining:	T1, R4	1	Chalk & Talk
		1.2	What Is Data Mining, -Motivating Challenges	T1, R4	1	Chalk & Talk
		1.3	The Origins of Data Mining, -Data Mining Tasks, -	T1, R4	1	Chalk & Talk
		1.4	Types of Data: Attributes and Measurement, Types of Data Sets, -	T1, R4	2	Chalk & Talk
		1.5	Data Quality: Measurement and Data Collection Issues, Issues Related to Applications.	T1, R4	2	Chalk & Talk
ASSIGNMENT EXAM – I						
2	CO2. Outline the need and importance of preprocessing techniques. [K2]		**UNIT-2. Data Preprocessing & Exploring data**			
		2.1	Data:- Data Preprocessing: Aggregation, Sampling, Dimensionality Reduction, Feature Subset Selection, Feature Creation,	T1, R4	2	Chalk & Talk,
		2.2	Discretization and Binarization, Variable Transformation,	T1, R4	2	Chalk & Talk,Tutorials
		2.3	-Measures of similarity and dissimilarity: Basics, Similarity and Dissimilarity between Simple Attributes, Dissimilarities between Data Objects, Similarities between Data Objects, Examples of Proximity Measures.	T1, R4	3	Seminars
		2.4	Exploring data: -The Iris Data set, -	T1, R4	2	PPT
		2.5	Summary Statistics: Frequencies and the Mode, Percentiles, Measures of Location: Mean and Median, Measures of Spread: Range and Variance, Multivariate Summary Statistics, Other Ways to Summarize the Data.	T1, R4	3	Chalk & Talk

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			ASSIGNMENT EXAM – II				
			UNIT-3. Data Warehouse and OLAP Tech. for Data Mining				
3	CO3. Interpret data warehousing concepts and operations. [K2]		3.1	What is a Data Warehouse, -A Multidimensional Data Model	T2, R3	2	Chalk & Talk,
			3.2	: From tables to data cubes, Stars, snowflake, and fact constellations(schemas for multidimensional databases),	T2, R3	2	PPT,
			3.3	Examples for defining star, snowflake, and fact constellation schemas, Measures(their categorization and computation),	T2, R3	2	Chalk & Talk
			3.4	Introducing concept hierarchies, OLAP operations in the multidimensional data model, A starnet query model for querying multidimensional databases, -	T2, R3	2	PPT,
			3.5	Data Warehouse Architecture: Steps for the design and construction of data warehouses, A three-tier data warehouse architecture, OLAP server architectures: ROLAP vs. MOLAP vs. HOLAP, SQL extensions to support OLAP operations, -	T2, R3	2	Chalk & Talk,
			3.6	Data Warehouse implementation: Efficient computation of data cubes, Indexing OLAP data, Efficient processing of OLAP queries, Metadata repository,	T2, R3	2	Chalk & Talk,
			3.7	Data warehouse back-end tools and utilities, -Further development of data cube technology: Discovery-driven exploration of data cubes, Complex aggregation at multiple granularities (Multifeature cubes),	T2, R3	2	PPT
			3.8	-From data warehousing to data mining: Data warehouse usage, From online analytical processing to online analytical mining.	T2, R3	2	Chalk & Talk,
			MID I EXAMINATION DURING SIXTH WEEK				
			UNIT-4. Classification				
4	CO4. Compare and contrast different dominant Data Mining Algorithms. [K2]		4.1	Classification: Basic Concepts, Decision Trees, and Model Evaluation: - Preliminaries, - General Approach to Solving a Classification Problem,	T1, T2, R1	2	Chalk & Talk,
			4.2	Decision Tree Induction: How a Decision Tree Works, How to Build a Decision Tree, Methods for Expressing Attribute Test Conditions, Measures for Selecting the Best Split, Algorithm for Decision Tree Induction, -	T1, T2, R1	2	Chalk & Talk,
			4.3	Model Overfitting: Overfitting Due to Presence of Noise, Overfitting Due to Lack of Representative Samples, -Evaluating the Performance of a Classifier: Holdout Method, Random Subsampling, Cross-Validation, Bootstrap.	T1, T2, R1	2	PPT
			4.4	Classification: alternative techniques: - Bayesian classifier: Bayes Theorem, Using Bayes theorem for classification, Naïve Bayesian classifier.	T1, T2, R1	2	Chalk & Talk
			ASSIGNMENT EXAM – III				
5	CO5. Analyze the performance		**UNIT 5. Association Analysis**				
			5.1	Association Analysis: Basic Concepts and Algorithms: -Problem Definition, -Frequent Itemset Generation: The Apriori principle,	T1, T2, R1	2	Chalk & Talk,

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	Association Rules. [K4]		Frequent Itemset Generation in the Apriori Algorithm,			
		5.2	Candidate Generation and Pruning, Support Counting, -Rule Generation: Confidence-Based Pruning, -Compact Representation of Frequent Itemsets: Maximal Frequent Itemsets, Closed Frequent Itemsets, -	T1, T2, R1	2	Seminors
		5.3	FP-Growth algorithms: FP-Tree Representation, Frequent Itemset Generation in FP-Growth Algorithm.	T1, T2, R1	2	Chalk & Talk
		5.4	Association Analysis: Advanced Concepts: -Handling Categorical Attributes, -Handling Continuous Attributes: Discretization-Based Methods, Statistics-Based Methods, Non-discretization Methods.	T1, T2, R1	2	Chalk & Talk,Tutorials
			ASSIGNMENT EXAM – IV			
			UNIT 5. Cluster Analysis			
		5.5	Cluster Analysis: Basic Concepts and Algorithms: -Overview: What is Cluster Analysis? Different Types of Clustering, Different Types of Clusters, -	T1, T2, R1	2	Chalk & Talk
	CO6. Summarize various application layer protocols [K2].	5.6	K-means: The Basic K-means Algorithm, K-means Additional Issues, Bisecting K-means, K-means and Different Types of Clusters, Strengths and Weaknesses, -	T1, T2, R1	2	Chalk & Talk
		5.7	Agglomerative Hierarchical Clustering: Basic Agglomerative Hierarchical Clustering Algorithm, Specific Techniques, -	T1, T2, R1	2	Chalk & Talk
		5.8	DBSCAN: Traditional Density (center based approach), The DBSCAN algorithm, Strengths and Weaknesses.	T1, T2, R1	2	Chalk & Talk
				Total	60	
			MID II EXAMINATION DURING EIGHTEENTH WEEK			
			END EXAMINATIONS			

Text Books:

T1 Introduction to Data Mining: Pang-Ning tan, Michael Steinbach, Vipin kumar, Addision-Wesley.

T2 Data Mining, Concepts and Techniques, 2/e, Jiawei Han, Micheline Kamber, Elsevier, 2006.

Reference Books:

R1 Data Mining: Introductory and Advanced Topics, Margaret H Dunham, Pearson, 2008.

R2 Introduction to Data Mining with Case Studies: GK Gupta; Prentice Hall.

R3 Fundamentals of data warehouses, 2/e , Jarke, Lenzerini, Vassiliou, Vassiliadis, Springer.

R4 Data Mining Theory and Practice, Soman, Diwakar, Ajay, PHI, 2006.

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DEPARTMENT OF INFORMATION TECHNOLOGY
LESSON PLAN: AY 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC31OE01	Disaster Management (R20)	III-I	Information Technology	6	A

COURSE OUTCOMES:

SNO	Course Outcome Statement
CO1	Understanding Disasters, man-made Hazards and Vulnerabilities K2&K3
CO2	Understanding disaster management mechanism K2&K3
CO3	Understanding capacity building concepts K2&K3
CO4	Understanding coping Strategies K2&K3
CO5	Understanding planning of disaster managements K2&K3

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT-I			
1	**CO1** Understanding Disasters, man-made Hazards and Vulnerabilities **K2&K3**]	1.1	**Understanding Disaster:** Concept of Disaster - Different approaches- Concept of Risk - Hazards and Vulnerabilities:	T1	2	Chalk &Talk
		1.2	Levels of Disasters - Disaster Phenomena and Events (Global, national and regional);	T1	3	Chalk &Talk, PPTS
		1.3	Natural and man-made hazards; response time, frequency and forewarning levels of different hazards	T1	3	Chalk &Talk, Tutorials
		1.4	Characteristics and damage potential or natural hazards; hazard assessment - Dimensions of	T1	3	Chalk &Talk, Tutorials
		1.5	vulnerability factors; vulnerability assessment - Vulnerability and disaster risk - Vulnerabilities to flood and earthquake hazards	T1	3	Chalk &Talk
			UNIT-II			
2	**CO2.**	2.1	**Disaster Management Mechanism:** Concepts of risk management and	T1	2	Chalk &Talk,

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	management mechanism K2&K3				2	
		2.3	Disaster Management Cycle - Response and Recovery	T1, R1	2	Chalk &Talk ,Case Study
		2.4	Development, Prevention, Mitigation	T1, R1	2	Chalk &Talk, NPTEL/MOOCS
		2.5	Preparedness - Planning for Relief	T1, R2	2	Chalk &Talk, NPTEL/MOOCS
			UNIT-III			
3.	CO 3 Understanding capacity building concepts K2&K3]	3.1	**Capacity Building:** Capacity Building: Concept	T', R3	2	Chalk &Talk ,tutorial
		3.2	Strengthening Capacity for Reducing Risk -	T1, R3	2	Chalk &Talk,
		3.3	Counter-Disaster Resources and their utility in Disaster Management	T1, R3	2	Chalk &Talk
		3.4	. Legislative Support at the state and national levels	T1, R3	2	Chalk &Talk
			1ST MID EXMINATION			
		3.5	Monitors- Usage, Dining-Philosophers solution using monitors	T1, R3	2.	Chalk &Talk
		3.6	- Structural and Nonstructural Measures Capacity Assessment;	T1, R1	2	Chalk &Talk
			UNIT-IV			
4	CO 4. Understanding coping Strategies K2&K3	4.1	**Coping with Disaster:** Coping Strategies;	T1,R1	2	Chalk &Talk
		4.2	alternative adjustment processes -	T1,T2	2	Chalk &Talk, PPTS
		4.3	Thrashing- Cause of Thrashing, Working set model, Page fault frequency	T1,R1	2	Chalk &Talk
		4.4	Changing Concepts of disaster management -	T1, R1	2	Chalk &Talk, Seminar
		4.5	Industrial Safety Plan; Safety norms and survival kits	T1, R1	2	Chalk &Talk
		4.6	Mass media and disaster management	T1, R1	2	Chalk &Talk, Seminar
			UNIT-V			
5.	CO 5. Understanding planning of disaster managements K2&K3	5.1	**Planning for disaster management:** Strategies for disaster management planning	T1, R1	2	Chalk &Talk
		5.2	Steps for formulating a disaster risk reduction plan	T1, R1	2	Chalk &Talk
		5.3	Disaster management Act and Policy in India	T1, R1	2	Chalk &Talk
		5.4	— Organizational structure for disaster management in India -	T1,, R1	2	Chalk &Talk
		5.5	Preparation of state and district disaster management plans.	T1,, R1	2	Chalk &Talk, PPTS

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				Total	60	
			2nd MID EXAMINATION			
			SEMESTER EXAMINATION			

T	BOOK TITLE/AUTHORS/PUBLISHER
T1	Disaster Management – Global Challenges and Local Solutions'by Rajib shah & R Krishnamurthy (2009), Universities press.
T2	Disaster Science & Management 'by Tushar Bhattacharya, Tata McGraw Hill Education Pvt. Ltd., New Delhi.
T3	Disaster Management – Future Challenges and Opportunities'by Jagbir Singh (2007), I K International Publishing House Pvt. Ltd.

REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Disaster Management 'edited by H K Gupta (2003), Universities press.

WEB SOURCE REFERENCES:

1	https://disasterinfo.nlm.nih.gov/dimrc/floods.html
2	https://disasterinfo.nlm.nih.gov/dimrc/coping.html
3	https://disasterinfo.nlm.nih.gov/dimrc.html
4	https://disasterinfo.nlm.nih.gov/enviro/disasterrecovery.html
5	http://go.usa.gov/xRGrw
6	https://toxtown.nlm.nih.gov/text_version/locations.php?id=55

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LESSON PLAN A.Y: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/ Week	Section
R20IT3104	**ADVANCED WEB TECHNOLOGIES**	III/I	IT	6	-

COURSE OUTCOMES: Students are able to

CO	Course Outcome Statement
CO1	Interpret Servlet Life Cycle and web servers. [K2]
CO2	Illustrate JSP Life cycle. [K2]
CO3	Apply Session Management for JSP applications. [K3]
CO4	Illustrate the usage of JDBC in JSP applications. [K2]
CO5	Make use of PHP for the development of web-based applications. [K3]
CO6:	Utilize JDBC in PHP web-based applications. [K3]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO 1:** Interpret Servlet Life Cycle and web servers. [K2]		**Unit-1**			
		1.1	Web Servers and Servlets: Tomcat web server introducing java Servlet, Introducing the servlet API.	T1, R1	2	Chalk & Talk
		1.2	Lifecycle of a Servlet	T1, T2, R2	2	Chalk & Talk
		1.3	Working with Initialization Parameters	T1, R2	1	Chalk & Talk
		1.4	Describing the Http Servlet Request & Http Servlet Response interfaces Cookies	T1, T2, R1	2	Chalk & Talk
		1.5	Session Tracking	T1, R1	1	PPTS
		1.6	Security Issues.	T1, T2, R1	1	Tutorial.
			Unit-2			
		2.1	Introduction to JSP: The Problem with Servlet.	T1, T2, R1	2	Chalk & Talk
		2.2	The Anatomy of a JSP Page	T1, T2, R1	2	Chalk & Talk

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2	**CO 2:** Illustrate JSP Life cycle. [K2]	2.3	JSP Processing.	T2, R2	2	Chalk & Talk
		2.4	JSP Application Design with MVC.	T2, R2	2	Chalk & Talk
		2.5	JSP Application Development: Generating Dynamic Content: directive elements	T2, R2	1	Chalk & Talk& Seminar
		2.6	What is template text, action elements.	T1, T2, R1	2	Chalk & Talk
		2.7	Using Scripting Elements, Implicit JSP Objects	T2, R2	2	Chalk & Talk
		2.8	Conditional Processing: Displaying Values Using an Expression to Set an Attribute	T2, R2	2	PPT
		2.9	Declaring Variables and Methods.	T1, T2, R1	2	Tutorial.
			Unit-3			
3	**CO3:** Apply Session Management for JSP applications. [K3]	3.1	JSP: Error Handling and Debugging	T1, T2, R2	2	Chalk & Talk& NPTEL
		3.2	Implicit JSP Objects	T1, R2	1	Chalk & Talk
		3.3	Sharing Data between JSP pages	T1, T2, R2	1	Chalk & Talk
		3.4	Requests, and Users Passing Control	T1, T2, R2	1	Chalk & Talk
			MID-I EXAMINATIONS			
			Unit-3			
		3.5	Data between Pages: Passing the control between the pages	T2, R1	2	Chalk & Talk
		3.6	Passing the data between JSP pages, Passing the data between JSP pages using session object	T2, R1	1	Chalk & Talk
		3.7	Memory Usage Considerations.	T2, R1	1	Tutorial.
4	**CO4:** Illustrate the usage of JDBC in JSP applications. [K2]		**Unit-4**			
		4.1	JDBC: Introduction	T1, R1	2	Chalk & Talk
		4.2	Database Programming Using JDBC: How JDBC Works	T1, T2, R1	1	Chalk & Talk
		4.3	JDBC Architecture	T1, R1	1	Chalk & Talk

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		4.4	JDBC Driver Types	T1, T2, R1	1	PPT
		4.5	Accessing Database From JSP page: Use of Prepared Statement	T1, T2, R1	1	Chalk & Talk
		4.6	ResultSet.		1	Tutorial.
			Unit-5			
5	**CO5:** Make use of PHP for the development of web-based applications. [K3]	5.1	PHP: Introduction to PHP, Creating PHP script, Running PHP script.	T1, T2, R2	2	Chalk & Talk
		5.2	Working with variables and constants, Data types, Operators.	T1, T2, R2	1	Chalk & Talk
		5.3	Controlling program flow, Working with Arrays, Built-in functions in PHP, User-defined functions in PHP, recursive, variable, and callback functions.	T1, R2	2	Chalk & Talk
		5.4	User and Database Interface: Database programming,	T1, R2	2	PPT
		5.5	Working with forms, validating a form	T1, T2, R2	1	Chalk & Talk
	CO6: Utilize JDBC in PHP web-based applications. [K3]	5.6	Working with Databases such as MySQL.	T1, T2, R2	2	Chalk & Talk
			MID-II EXAMINATIONS			
			END EXAMINATIONS			

TEXT BOOKS

T	BOOK TITLE/AUTHORS/PUBLISHER
T1	A.A. Puntambekar , "Web Technologies" , Technical Publications, Pune.
T2	"Web Technologies Black Book" , Kognent Learning Solutions Inc Sol. DreamTech Press

REFERENCE BOOKS

R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Wang Thomson, "An Introduction to Web Design and Programming".
R2	Wang, Katila, "An Introduction to Web Design + Programming", CENGAGE.
R3	Web Technologies A Developer's Perspective, N.P.Gopalan, Akhilandeswari, PHI.

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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601**

DEPARTMENT OF INFORMATION TECHNOLOGY
LESSON PLAN: AY 2024-25

Course Code	Course Title (Regulation)	Year	Sem	Branch	Contact Periods/Week	Section
R20IT3103	Automata and Compiler Design	III	I	Information Technology	6	A

COURSE OUTCOMES:
After successful completion of this course, students will be able to:
CO 1: Summarize different phases and passes of a compiler. [K2]
CO 2: Compare and Contrast various Top-Down and Bottom-Up Parsing techniques. [K2]
CO 3: Interpret different types of Intermediate Code representations. .[K2]
CO 4: Illustrate the effective usage of register allocation and various Code-generation techniques. .[K2]
CO 5: Apply different code-optimization techniques to optimize the target code. .[K3]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1: Summarize the concept of Automata and Construct Finite Automata Machines to recognize the languages. [K3] CO 2: Ability to implement practical aspects of automata theory. [K4]	**Unit-1. OVERVIEW OF LANGUAGE PROCESSING**				
		1.1	Languages, Definition of a Language and operations on a language	T1, T2, R1	8	Chalk & Talk, PPT, & Tutorial
		1.2	Regular Expressions	T1, T2, R1		
		1.3	Finite Automata – DFA, NFA, NFA - ε	T1, T2, R1		
		1.4	Equivalence of NFA and DFA , NFA- ε and NFA	T1, T2, R2		
		1.5	Conversion of Regular Expression to NFA- ε	T1, T2, R1		
		1.6	Applications of Finite Automata to lexical analysis	T1, T2, R1		
		1.7	Lex tools	T1, T2, R1		
ASSIGNMENT I EXAMINATION						
2	CO3. Analyze Different parsing techniques and should be position to solve the problems. [K3]	**Unit-2. SYNTAX ANALYSIS**				
		2.1	Syntax Analysis, discussion on CFG, LMD,RMD, parse trees	T1, T2, R2	10	Chalk & Talk, PPT Tutorial,
		2.2	Role of a parser, Classification of parsing techniques	T1, T2, R2		
		2.3	Brute force approach left recursion, left factoring	T1, T2, R2		
		2.4	Top down parsing, First and Follow-LL(1) Grammars	T1, T2, R3		
		2.5	Non- Recursive predictive parsing	T1, T2, R3		
		2.6	Error recovery in predictive parsing	T1,T2, R3		
3	CO 3.	**Unit-3. TYPES OF BOTTOM-UP APPROACHES**				
		3.1	Bottom up parsing approach, Types, Introduction to simple LR, Why LR Parsers, Model of an LR Parsers	T1, T2, R1		Chalk & Talk, PPT, Tutorial
		3.2	Operator Precedence	T1, T2, R1		

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	Analyze Different parsing techniques and should be position to solve the problems. [K3]	3.3	Shift Reduce Parsing, Difference between LR and LL Parsers	T1, T2, R1	12	
		3.4	Construction of SLR Tables, More powerful LR parsers	T1, T2, R1		
		3.5	construction of CLR (1)	T1, T2, R1		
		3.6	LALR Parsing tables	T1, T2, R1		
		3.7	Dangling ELSE Ambiguity, Error recovery in LR Parsing	T1, T2, R1		
		3.8	Comparison of all bottoms up approaches with all top down approaches	T1, T2, R1		
MID I EXAMINATION						
		Unit-4. SEMANTIC ANALYSIS				
4	CO 4. Ability to design of a compiler given features of the languages. [K3]	4.1	Semantic analysis, SDT, evaluation of semantic rules	T1, T2, R3	10	Chalk & Talk, PPT & Tutorial,
		4.2	Intermediate code, three address code, Quadruples, Triples	T1, T2, R3		
		4.3	abstract syntax trees	T1, T2, R3		
		4.4	Types and declarations and Type Checking	T1, T2, R3		
ASSIGNMENT II EXAMINATION						
		Unit 4. SYMBOL TABLE				
5	CO 4. Ability to design of a compiler given features of the languages. [K3]	5.1	Symbol Tables, use and need of symbol tables	T1, T2, R3	10	Chalk & Talk, PPT& Seminars
		5.2	Runtime Environment: storage organization	T1, T2, R3		
		5.3	stack allocation, access to non-local data, heap management	T1, T2, R3		
		5.4	Parameter passing mechanisms, introduction to garbage collection	T1, T2, R2		
		5.5	Reference counting garbage collectors	T1, T2, R2		
		5.6	Code generation: Issues, target language	T1, T2, R3		
		5.7	Basic blocks & flow graphs, Simple code generator	T1, T2, R3		
		5.8	Peephole optimization	T1, T2, R3		
		5.9	Register allocation and assignment	T1, T2, R3		
		Unit 5. CODE OPTIMIZATION				
6	CO 5. Analyze the program and minimize the code by using optimizing techniques which helps in reducing the no. of instructions in a program. [K3]	6.1	Machine independent code optimization - semantic preserving transformations	T1, T2, R4	5	Chalk & Talk, PPT & Seminars
		6.2	global common sub expression elimination, copy propagation, dead code elimination, constant folding, strength reduction, Loop optimization	T1, T2, R4		
		6.3	Instruction scheduling, Inter procedural optimization	T1, T2, R4		
				Total	55	
MID II EXAMINATION						
END EXAMINATIONS						

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ext Books:

T1 Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, "Compilers – Principles, Techniques & Tools", Pearson, Second edition, 2007.

T2 K. Muneeswaran, "Compiler Design", Oxford University Press, 2013.

Reference Books:

R1 Keith D. Cooper, & Linda Torczon, "Engineering a Compiler", Morgan Kaufman publications, Second edition, 2011.

R2 V. Raghavan, "Principles of Compiler Design", TMH, Second edition, 2011.

R3 . Kenneth C. Louden, "Compiler Construction - Principles and Practice", Cengage Learning publications, First edition,1997.

R4 Yunlin Su, Song Y. Yan, "Implementations of Compiler - A new approach to Compilers including the Algebraic Methods", Springer publications, 2011.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF INFORMATION TECHNOLOGY A.Y: 2024-2025
LESSON PLAN

Course Code	Course Title (Regulation)	year	Sem	Branch	Contact Periods/Week	Sections
R20CC3101	Operating Systems	III	I	IT	6	A

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO 1: Classify various operating system functionalities and generations. [K2]
CO 2: Interpret process management and exemplify the process synchronization techniques. [K2]
CO 3: Apply various process scheduling algorithms. [K3]
CO 4: Distinguish various memory management techniques and apply various deadlock techniques. [K4]
CO 5: Compare and contrast various disk scheduling algorithms and can interpret the file system implementations. [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT-I			
1	**CO 1:** Classify various operating system functionalities and generations. [K2]	1.1	Computer System and Operating System Overview: Overview of Operating System - What operating systems do, User view, System view, defining operating systems;	T1	2	Chalk &Talk
		1.2	Operating Systems functions- Process Management, Memory Management, Storage Management, File-System Management, Mass-Storage Management, Caching, Protection and security;	T1	2	Chalk &Talk, PPTS
		1.3	Distributed systems, Special purpose systems, Real-Time Embedded Systems, Multimedia Systems, Handheld Systems, Operating Systems Structures, Simple Structure, Layered Approach, Micro Kernels, Modules;	T1	2	Chalk &Talk, Tutorials
		1.4	Systems Calls- Process control, File management, Device management,	T1		Chalk &Talk, Tutorials

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		1.5	Operating systems generation.	T1	2	Chalk &Talk
			UNIT-II			
2	CO2: Interpret process management and exemplify the process synchronization techniques.	2.1	Process Management: Process, Process States, Process Control Block, Process Scheduling Scheduling Queues, Schedulers;	T1	2	Chalk &Talk,
		2.2	Operations- Process Creation, Process termination; Inter process communication- Shared-Memory Systems, Message-Passing Systems, Naming, Synchronization	T1	2	Chalk &Talk,
		2.3	Multi Thread programming models- Many to one, One to one, Many to Many model	T1, R1	2	Chalk &Talk ,Case Study
		2.4	Process Scheduling Criteria- CPU scheduler, Preemptive scheduling, Dispatcher, Scheduling Criteria	T1, R1	2	Chalk &Talk, . NPTEL/MOOCS
		2.5	CPU Scheduling Algorithms- First Come First Serve, Shortest job first, Priority Scheduling, Round robin scheduling.	T1, R2	2	Chalk &Talk, NPTEL/MOOCS
			UNIT-III			
3.	**CO 3:** Apply various process scheduling algorithms. [K3]	3.1	Concurrency: Process Synchronization, The Critical-Section Problem, Peterson's Solution, Synchronization Hardware. Semaphores- Usage, Implementation, Deadlock and Starvation;	T', R3	2	Chalk &Talk ,tutorial
		3.2	Classic Problems of Synchronization- Bounded buffer problem,	T1, R3	3	Chalk &Talk,
		3.3	Readers writers' problem, Dining-Philosophers problem;	T1, R3	3	Chalk &Talk
		3.4	Monitors- Usage, Dining-Philosophers solution using monitors.	T1, R3	2	Chalk &Talk
			1ST MID EXMINATION			
		3.5	**Memory Management**: Swapping, Contiguous Memory Allocation-Memory Allocation, Fragmentation;	T1,, R1	3	Chalk &Talk
		3.6	Paging- Basic Method, Hardware Method, Protection, shared pages; Structure of the Page table-Hierarchical Paging, Hashed Page Tables. Segmentation- Basic Method, hardware	T1, R1	4	Chalk &Talk
			UNIT-IV			
		4.1	**Virtual Memory Management**: Virtual Memory. Demand Paging-Basic concept, copy on write;	T1,R1	2	Chalk &Talk
		4.2	Page-Replacement Algorithms-Basic page replacement,-FIFO page ; optimal page, LRU page, LFU page replacement	T1,T2	3	Chalk &Talk, PPTS

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4	**CO 4:** Distinguish various memory management techniques and apply various deadlock techniques. [K4]	4.3	Thrashing- Cause of Thrashing, Working set model, Page fault frequency	T1,R1	2	Chalk &Talk
		4.4	**Principles of Deadlock**: Deadlock System Model. Deadlock Characterization- Necessary Conditions, Resource allocation graph	T1, R1	2	Chalk &Talk, Seminar
		4.5	Deadlock Prevention- Mutual exclusion, Hold and wait, No preemption, Circular wait;	T1, R1	2	Chalk &Talk
		4.6	Deadlock Detection and Avoidance- Resource allocation Graph algorithm, Banker's algorithm, Single instance of each resource type, several instances of each resource type;	T1, R1	2	Chalk &Talk, Seminar
		4.7	Recovery Form Deadlock- Process termination, Resource preemption	T1, R1	2	Chalk &Talk
			UNIT-V			
5.	**CO 5:** Compare and contrast various disk scheduling algorithms and can interpret the file system implementations. [K2]	5.1	File System: The Concept of a File- file attributes, file operations, file types, file structures; Access Methods- sequential access, direct access, other access methods	T1, R1	2	Chalk &Talk
		5.2	Directory Structure single level directory, two level directories, tree structured directory, general graph directory; File Sharing- multiple users, remote file systems;	T1, R1	2	Chalk &Talk
		5.3	Protection- types of access, access control. **Implementing File System**: File System Structure. File System Implementation- overview, partitions and mounting, virtual file systems;	T1, R1	2	Chalk &Talk
		5.4	Allocation Methods- contiguous allocation, linked allocation, indexed allocation; Free-Space Management- linked list, grouping, counting.	T1,, R1	2	Chalk &Talk
		5.5	Disk Scheduling- FCFS scheduling, SSTF scheduling, SCAN scheduling, C-SCAN scheduling, LOOK scheduling.	T1,, R1	2	Chalk &Talk, PPTS
				Total	**60**	
			2nd MID EXAMINATION			
			SEMESTER EXAMINATION			

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Text Books:

T1 : Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7/e, John Wiley, 2016.

Reference Books:

R1 Operating Systems – Internal and Design Principles Stallings, 6/e, Pearson Education, 2005

R2 Operating Systems – A Concept based Approach – D.M.Dhamdhere, 2/e, TMH, 2005.

R3 Operating System a Design Approach-Crowley, 1/e, TMH, 2005..

R4 Andrew S Tanenbaum , "Modern Operating Systems", PHI, 3/e, 2013.

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DEPARTMENT OF INFORMATION TECHNOLOGY
LESSON PLAN A.Y:2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20IT4107	BLOCK CHAIN TECHNOLOGIES	IV/I	INFORMATION TECHNOLOGY	6	A

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO1: Summarize the fundamentals of Block chain.[K2]

CO2: Analyze the working of Block chain.[K4]

CO3: Interpret how business can be easily made with Block chain.[K4]

CO4: Summarize how Block Chain can be integrated with various current technologies.[K2]

CO5: Get familiarity about the Block chain strength in providing solutions.[K3]

CO6: Investigate and understand the Problems with Block chain.[K4].

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1: Summarize the fundamentals of Block chain. [K2]		**UNIT-1: GRASPING BLOCKCHAIN FUNDAMENTALS**			
		1.1	Grasping Block chain Fundamentals	T1, T2, R1,R2	2	Chalk, Talk, PPT & Tutorial
		1.2	Tracing Block chains Origin	T1, T2, R1,R2	1	
		1.3	The shortcomings of current transaction systems	T1, T2, R1,R2	1	
		1.4	The emergence of bit coin	T1, T2, R1,R2	2	
		1.5	The birth of block chain	T1, T2, R1,R2	1	
		1.6	Revolutionizing the Traditional Business Network	T1, T2, R1,R2	2	
		1.7	Exploring a block chain application, Recognizing the key business benefits, Building trust with block chain.	T1, T2, R1,R2	1	
2	CO 2. Analyse the working of Block chain. [K4]		**UNIT-2: TAKING A LOOK AT HOW BLOCKCHAIN WORKS**			
		2.1	Why It's Called "Block chain"	T1, T2, R1,R2	2	Chalk, Talk, & PPT
		2.2	What Makes a Block chain Suitable for Business?	T1, T2, R1,R2	2	
		2.3	Shared ledger, Permissions	T1, T2, R1,R2	2	
		2.4	Consensus, Smart contracts	T1, T2, R1,R2	2	
		2.5	Identifying Participants Participants & Their Roles	T1, T2, R1,R2	2	

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3	CO 3. Interpret how business can be easily made with Block chain. [K2]	**UNIT-3. PROPELLING BUSINESS WITH BLOCKCHAINS**				
		3.1	Recognizing Types of Market Friction	T1, T2, R1,R2	2	Chalk, Talk, PPT & Tutorial
		3.2	Information frictions	T1, T2, R1,R2	2	
		3.3	Interaction frictions, Innovation frictions	T1, T2, R1,R2	2	
		MID -I EXAMINATION				
		3.4	Moving Closer to Friction-Free Business Networks	T1, T2, R1,R2	1	
		3.5	Reducing information friction Transforming Ecosystems through Increased Visibility	T1, T2, R1,R2	2	
		3.6	Easing interaction friction Easing innovation friction	T1, T2, R1,R2	1	
4	CO4: Illustrate how Block Chain can be integrated with various current technologies. [K2]	**UNIT-4: BLOCKCHAIN IN ACTION**				
		4.1	Use Cases	T1, T2, R1,R2	1	Chalk, Talk, PPT & Tutorial
		4.2	Financial Services.	T1, T2, R1,R2	1	
		4.3	Commercial financing	T1, T2, R1,R2	1	
		4.4	Trade finance	T1, T2, R1,R2	1	
		4.5	Cross-border transactions	T1, T2, R1,R2	1	
		4.6	Insurance, Government	T1, T2, R1,R2	1	
		4.7	Supply Chain Management, Healthcare	T1, T2, R1,R2	1	
		4.8	Electronic medical records Healthcare payments preauthorization.	T1, T2, R1,R2	1	
5	CO5: Get familiarity about the Block chain strength in providing solutions. [K3]	**UNIT– 5.1: HYPER LEDGER**				
		5.1.1	Linux Foundation Project	T1, T2, R1,R2	2	Chalk, Talk & Seminar
		5.1.2	Hyper ledger Vision Hyper ledger Fabric	T1, T2, R1,R2	2	
		5.1.3	How Can IBM Help Developers Innovate with Block chain?	T1, T2, R1,R2	2	
		5.1.4	Offering an easily accessible cloud and development platform	T1, T2, R1,R2	3	
		5.1.5	Individualized attention and industry Expertise	T1, T2, R1,R2	3	
5	CO6: Investigate the Problems with Block chain. [K4]	**UNIT – 5.2: PROBLEMS WITH BLOCKCHAIN**				
		5.2.1	Security and Safeguards	T1, T2, R1,R2	3	Chalk, Talk & NPTEL
		5.2.2	Protection from attackers	T1, T2, R1,R2	3	
		5.2.3	Hacks on exchanges	T1, T2, R1,R2	2	
		5.2.4	What is stopping adoption? Scalability problems	T1, T2, R1,R2	2	

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		5.2.5	Network attacks to destroy bit coin Case Study: Failed currencies & Block chain	T1, T2, R1,R2	2	
MID-II EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS:

T1: 1.Blockchain For Dummies®, IBM Limited Edition,

T2: 2. Blockchain For Manav Gupta, John Wiley & Sons, Inc.111 River St, Hoboken, NJ 07030-5774

REFERENCES:

1. Swan, Melanie. Blockchain: Blueprint for a new economy. "O'Reilly Media, Inc.", 2015.

2. Gupta, M. "Blockchain For Dummies." (2017).

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DEPARTMENT OF INFORMATION TECHNOLOGY
LESSON PLAN A.Y:2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC4OE012	E-COMMERCE	IV-1	INFORMATION TECHNOLOGY	6	1

COURSE OUTCOMES:

After completion of this course, the students would be able to

CO 1: Interpret the E-commerce applications and Process Model. [K2]

CO 2: Compare and contrast various electronic Payment Systems. [K3]

CO 3: Interpret the Intra Organizational Commerce. [K2]

CO 4: Outline the corporate digital library and marketing research. [K2]

CO 5: Analyze resource discovery and information filtering. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Interpret the E-commerce applications and Process Model. [K2].		**UNIT-I**			
		1.1	Electronic Commerce-Framework	T1	2	Chalk & Talk
		1.2	anatomy of E-Commerce applications	T1	2	Chalk & Talk
		1.3	E-CommerceConsumer applications	T1	3	PPTS
		1.4	E-Commerce organization applications	T1	3	Chalk & Talk,
2	CO2: Compare and contrast various electronic Payment Systems. [K3]		**UNIT-II**			
		2.1	Consumer Oriented Electronic commerce	T1	2	Chalk & Talk
		2.2	Mercantile Process models.	T1	2	students seminar
			1st MID EXAMINATION			
		2.3	Electronic payment systems	T1, R1	3	Chalk & Talk
		2.4	Risks in Electronic payment systems	T1, R1	3	Chalk & Talk
3	CO3: Interpret the Intra Organizational Commerce. [K2]		**UNIT-III**			
		3.1	Intra Organizational Commerce	T', R3	3	Chalk & Talk
		3.2	Automation Customization	T1, R3	5	Chalk & Talk
		3.3	.InternalCommerce	T1, R3	2	Chalk & Talk
		3.4	Supply chain Management	T1,, R1	3	PPTS

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			UNIT-IV			
4	**CO 4:** Outline the corporate digital library and marketing research. [K2]	4.1	Corporate Digital Library	T1,R1	2	Chalk & Talk
		4.2	Document Library, digital Document types	T1,T2	2	Chalk & Talk
		4.3	corporate DataWarehouses.	T1,R1	2	Chalk & Talk
		4.4	Advertising and Marketing	T1, R1	2	Chalk & Talk
		4.5	Information based marketing	T1, R1	2	Chalk & Talk
		4.6	Advertising on Internet	T1, R1	2	Chalk & Talk
		4.7	on-linemarketing process, market research.	T1, R1	2	PPTS
5	**CO 5:** Analyze resource discovery and information filtering. [K4]]		**UNIT-V**			
		5.1	Consumer Search and Resource Discovery	T1, R1	3	Chalk & Talk
		5.2	Information search and Retrieval	T1, R1	3	Chalk & Talk
		5.3	CommerceCatalogues	T1, R1	2	Chalk & Talk
		5.4	Information Filtering	T1,, R1	2	Chalk & Talk
		5.5	Digital Video and electronic Commerce	T1,, R1	2	Chalk & Talk
				Total	**60**	
			2nd MID EXAMINATION			
			SEMESTER EXAMINATION			

TEXT BOOKS :

T1: Kalakata, Whinston, "Frontiers of electronic commerce", Pearson.

REFERENCE BOOKS :

R1. Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley, "E-Commerce fundamentals and applications"

R2. S.Jaiswal – Galgotia, "E-Commerce".

R3. Efrain Turbon, Jae Lee, David King, H.Michael Chang, "E-Commerce".

R4. Gary P.Schneider, "Electronic Commerce", Thomson.

R5. E-Commerce – Business, Technology, Society, Kenneth C.Taudon, Carol Guyerico Traver.

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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601**

DEPARTMENT OF INFORMATION TECHNOLOGY
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R20CC4117	E&I (R20)	IV-I	IT	6	A

COURSE OUTCOMES: Student is able to

CO1 : Outline the concepts of Entrepreneurship.[K2]
CO2 : Create the awareness on creativity and innovation.[K6]
CO3 : Adopt the Entrepreneurship Development programs[K6]
CO4 : Evaluate the project planning and feasibility studies.[K5]
CO5 : Analyze the concept of small and micro enterprises.[K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Outline the concepts of Entrepreneurship.[K2]		**Unit-1. Entrepreneur And Entrepreneurship**			
		1.1	Entrepreneur – Definitions, concept of entrepreneur	T1, R1	1	Chalk & Talk
		1.2	characteristics of entrepreneur, types of entrepreneurs	T1, R1	2	Chalk & Talk,PPT
		1.3	concept of entrepreneurship, characteristics of entrepreneurship	T1, R1	2	Chalk & Talk
		1.4	role of entrepreneurship in economic development	T1,R1	1	Chalk & Talk
		1.5	ethics and social responsibilities of an entrepreneur	T1,R1	2	Chalk & Talk,PPT
		1.6	Financial institutional support to entrepreneurs(IDBI,SISI,DIC,NIESBUD, Commercial banks etc.,	T1,R1	2	Chalk & Talk,PPT
2	CO2: Create the awareness on creativity and innovation.[K6]		**Unit-2. Creativity And Innovation In Entrepreneurship**			
		2.1	Meaning and concept of creativity - Nature and characteristics of creativity	T1, R1	2	Chalk & Talk,PPT
		2.2	Creativity Process- Factors affecting creativity	T1, R1	2	Chalk & Talk
		2.3	Meaning and Importance Innovation - Process	T1, R1	2	Chalk & Talk,PPT
		2.4	Distinguish the Creativity and Innovation.	T1, R1	2	Chalk & Talk
3	CO3: Adopt the Entrepreneurship Development programs[K6]		**Unit-3. Entrepreneurship Development Programmes**			
		3.1	Designing Appropriate Training Programme to inculcate Entrepreneurial Spirit	T1, R1	2	Chalk & Talk
		3.2	Training for Entrepreneurs, Entrepreneurship Development Programme (EDP)	T1, R1	2	Chalk & Talk,PPT
		3.3	Need and objectives of EDP's	T1, R1	2	Chalk & Talk
			MID I EXAMINATION			
		3.4	Phases and evolution on EDP's existing and new Entrepreneurs.	T1, R1	2	Chalk & Talk,PPT

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		Unit-4. Project Planning And Feasibility Studies				
4	CO4: Evaluate the project planning and feasibility studies.[K5]	4.1	Meaning of a project, Project identification – Sources of new Ideas	T2, R2	3	Chalk & Talk
		4.2	Methods of generating ideas, Project selection,	T2, R2	2	Chalk & Talk,PPT
		4.3	Project Feasibility Study -Project evaluation and Techniques	T2, R2	3	Chalk & Talk
		4.4	(PBP, ARR, NPV, IRR & PI).	T2, R2	4	Chalk & Talk
5	CO5:Analyze the concept of small and micro enterprises.[K4]	**Unit 5. Small And Micro Enterprises**				
		5.1	Importance, definitions, MSME's Development Act 2006	T2, R2	2	Chalk & Talk,PPT
		5.2	policies and their support to MSMEs	T2, R2	2	Chalk & Talk
		5.3	Growth of Firm and growth strategies,	T2, R3	2	Chalk & Talk
		5.4	Factors inducing growth	T2, R2	2	Chalk & Talk,PPT
		5.5	Sickness in small business and remedies.	T2, R3	2	Chalk & Talk
				Total	50	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1 "Entrepreneurship", Arya Kumar: Pearson, Publishing House, New Delhi, 2012.
T2 "Entrepreneurship', VSP Rao, Kuratko: Cengage Learning, New Delhi,2012
T3 ShoimoMaital, DVR Seshadri, "Innovation Management", Response Books 2007

Reference Books:

R1 "Entrepreneurship Development" B.Janakiram, M Rizwana: Excel Books, ND, 2011
R2 "Entrepreneurship Development", P.C.Shejwalkar Everest Publishing House, ND, 2011

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DEPARTMENT OF INFORMATION TECHNOLOGY
LESSON PLAN
Academic Year 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC3OE11	**DIGITAL MARKETING ((R20)**	IV/I	INFORMATION TECHNOLOGY	6	A

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO1: Develop insight on Current Trends – Digital and Social Statistics (Infographics) (K6)

CO2: Analyze the Digital Marketing Platforms like Face book, Twitter, YouTube etc.(K4)

CO3: Analyze the basics of Search Engine Optimization (SEO) and Mobile Marketing.(K4)

CO4: Design the various strategies involved in Marketing products and Services Digitally.(k6)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1. Develop insight on Current Trends – Digital and Social Statistics (Infographics) (K6)		**UNIT-1: Introduction to Digital Marketing**			
		1.1	Evolution of Digital Marketing from traditional	T1, T2, R1,R3	2	Chalk& Talk, PPT
		1.2	Role of Internet, Current trends, Digital landscape	T1, T2, R1,R3	2	Learning & Tutorial
		1.3	Info-graphics, Implications for business & society	T1, T2, R1,R3	1	Chalk& Talk,
		1.4	Emergence of digital marketing as a tool	T1, T2, R1,R3	1	Chalk&Talk, PPT
		1.5	Drivers of the new marketing environment	T1, T2, R1,R3	1	Chal&Talk,
		1.6	Revolutionizing the Traditional Business Network	T1, T2, R1,R3	1	Chalk&Talk, PPT
		1.7	Digital marketing plan, Digital marketing models	T1, T2, R1,R3	2	Learning & Tutorial
		1.8	Digital marketing strategy, P.O.E.M. framework	T1, T2, R1,R3	2	PPT, Flipped
2	CO 2.		**UNIT-2: Internet Marketing and Digital Marketing Mix**			

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	Analyze the Digital Marketing Platforms like Face book, Twitter, YouTube etc.(K4)	2.1	Internet Marketing, Opportunities and challenges	T1, T2, R1,R3	2	Chalk&Talk PPT Tutorial
		2.2	Digital marketing framework, Digital Marketing mix, Pay for Search Advertisements	T1, T2, R1,R3	2	Chalk& Talk PPT
		2.3	Impact of digital channels on IMC Search Engine Advertising Ad Placement, Ad Rank	T1, T2, R1,R3	2	Chalk& Talk, PPT, Tutorial
		2.4	Creating Ad Campaigns, Campaign Report Generation Display marketing, Types of Display Ads, Buying Models	T1, T2, R1,R3	2	Chalk& Talk PPT
		2.5	Programmable Digital Marketing, Analytical Tools and examples	T1, T2, R1,R3	2	Chalk&Talk
		2.6	YouTube marketing with examples	T1, T2, R1,R3	2	Chalk& Talk
3	CO 3. Analyze the basics of Search Engine Optimization (SEO) and Mobile Marketing.(K4)	**UNIT-3. Social Media Marketing**				
		3.1	Introduction to social media platforms, penetration & characteristics	T1, T2, R1,R3	2	Chalk& Talk, PPT, Blended Learning & Tutorial
		3.2	Building a successful social media marketing strategy, Face book Marketing	T1, T2, R1,R3	2	Chalk& Talk
		3.3	Business through Face book Marketing, creating Advertising Campaigns	T1, T2, R1,R3	2	Chalk& Talk
		3.4	Adverts, Face book Marketing Tools LinkedIn Marketing, Introduction and Importance of LinkedIn Marketing	T1, T2, R1,R3	2	Chalk&Talk PPT
		3.5	Framing LinkedIn Strategy, Lead Generation through LinkedIn	T1, T2, R1,R3	2	Chalk&Talk
		3.6	Content Strategy, Analytics and Targeting.	T1, T2, R1,R3	2	Chalk& Talk
MID I EXAMINATION DURING SIXTH WEEK						
4		**UNIT-4: Twitter Marketing**				

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	CO4: Design the various strategies involved in Marketing products and Services digitally.(k6)	4.1	Introduction to Twitter Marketing, how twitter Marketing is framing content strategy.	T1, T2, R1,R3	2	Chalk&Talk
		4.2	Twitter Advertising Campaigns, Instagram and Snapchat.	T1, T2, R1,R3	2	Chalk& Talk, PPT , Web Resources Tutorial
		4.3	Digital Marketing Strategies , Mobile Advertising	T1, T2, R1,R3	2	Chalk& Talk, PPT Tutorial
		4.4	Forms of Mobile Marketing	T1, T2, R1,R3	2	Chalk&Talk
		4.5	Features Mobile Campaign Development	T1, T2, R1,R3	2	Chalk&Talk
		4.6	Mobile Advertising Analytics.	T1, T2, R1,R3	2	Chal&Talk, students collaborative learning
5	CO5: Design the various strategies involved in Marketing products and Services digitally.(k6)	**UNIT – 5:Introduction to SEO**				
		5.1	Web Analytics, Mobile Marketing.	T1, T2, R1,R3	2	Chalk&Talk, PPT , Students Seminars &
		5.2	Trends in Digital Advertising, How to use internet &search engines	T1, T2, R1,R3	2	Chalk&Talk, Tutorial
		5.3	Search engine and its working pattern, On-page and off-page optimization	T1, T2, R1,R3	2	Chalk& Talk, PPT Chalk&Talk,
		5.4	SEO Tactics, Introduction to SEM Web Analytics, Google Analytics & Google AdWords	T1, T2, R1,R3	2	Chalk&Talk, PPT , Students Seminars & Tutorial
		5.5	data collection for web analytics, multichannel attribution	T1, T2, R1,R3	2	Chalk&Talk,
		5.6	Trends in digital advertising.	T1, T2, R1,R3	2	Chalk&Talk, PPT
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

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TEXT BOOKS:
T1:Seema Gupta, Digital Marketing, Mc-Graw Hill, 1st Edition- 2017
T2:Ian Dodson, The Art of Digital Marketing, Wiley Latest Edition
T3:Puneet Singh Bhatia, Fundamentals of Digital Marketing, Pearson, 1st Edition – 2017
REFERENCE BOOKS:
R1:Vandana Ahuja, Digital Marketing, Oxford University Press, Latest Edition
R2.:Philip Kotler, Marketing 4.0: – Moving from Traditional to Digital, Wiley 2017
R3:Melissa S. Barker |Donald I. Barker | Nicholas F. Bormann | Debra Zahay | Mary Lou Roberts, Social Media Marketing: AStrategic Approach, Cengage Latest Edition
R4:Ward Hanson , Kirthi Kaly anam, Internet Marketing & e-Commerce Cengage Latest Edition

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601 Department of Information Technology

DEPARTMENT OF INFORMATION TECHNOLOGY

LESSON PLAN AY: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC4106	NATURAL LANGUAGE PROCESSING	IV-I	IT	6	A

COURSE OUTCOMES: Students are able to

S. No.	Course Outcome Statement
CO1	Describe the concepts of morphology, syntax, semantics, discourse & pragmatics of natural language. [K2]
CO2	Demonstrate understanding of the relationship between NLP and statistics & machine learning. [K2]
CO3	Discover various linguistic and statistical features relevant to the basic NLP task, namely, spelling correction, morphological analysis, parts-of-speech tagging, parsing and semantic analysis. [K4]
CO4	Develop systems for various NLP problems with moderate complexity. [K4]
CO5	Evaluate NLP systems, identify shortcomings and suggest solutions for these shortcomings. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Describe the concepts of morphology, syntax, semantics, discourse &pragmatics of	Unit-1. Introduction to NLP				
		1.1	Introduction to NLP	T1	1	Chalk & Talk
		1.2	introduction and applications	T1	1	Chalk & Talk

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	natural language. [K2]	1.3	NLP phases	T1	1	Flipped classroom
		1.4	Difficulty of NLP including ambiguity;	T1	2	PPT
		1.5	Spelling error and Noisy Channel Model;	T1	2	Chalk & Talk
		1.6	Concepts of Parts-of-speech	T1	2	Chalk & Talk
		1.7	Formal Grammar of English.	T1	2	Chalk & Talk
	I ASSIGNMENT EXAMINATION					
2	**CO2:** Demonstrate understanding of the relationship between NLP and statistics & machine learning. [K2]	**Unit-2.**:Language Modeling:				
		2.1	N-gram	T2	1	Chalk & Talk
		2.2	Neural Language Models Language Modelling with Ngram	T2	2	Chalk & Talk
		2.3	Simple N-gram models	T2	2	Chalk & Talk
		2.4	Smoothing (basic techniques)	T2	2	Chalk & Talk
		2.5	Evaluating language models	T2	2	Chalk & Talk
		2.6	Neural Network basics,	T2	2	Chalk & Talk
		2.7	Training;	T2	1	Chalk & Talk
		2.8	Neural Language Model	T1	2	Chalk & Talk
		2.9	Case study: application of neural language model in NLP system development.	T1	1	Chalk & Talk
3	**CO3**:Discover various linguistic and statistical features relevant to the basic NLP	**Unit-3.** Parts-of-speech Tagging Parts-of-speech Tagging:				
		3.1	Parts-of-speech Tagging:	T1	1	Chalk & Talk
		3.2	basic concepts;	T1	1	Chalk & Talk

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	task, namely, spelling correction, morphological analysis, parts-of-speech tagging, parsing and semantic analysis. [K4]	3.3	Tagset;	T1	2	Chalk & Talk
		3.4	Early approaches: Rule based and TBL	T1	1	Chalk & Talk
		3.5	POS tagging using HMM	T1	1	Chalk & Talk
	I MID EXAMINATION					
3	**CO3** : Discover various linguistic and statistical features relevant to the basic NLP task, namely, spelling correction, morphological analysis, parts-of-speech tagging, parsing and semantic analysis. [K4]	**Unit-3. Models of Cloud Computing**				
		3.6	Early approaches: Rule based and TBL	T1	1	Chalk & Talkl
		3.7	POS tagging using HMM	T1	1	Chalk & Talk
		3.8	Introduction to POS Tagging using Neural Model.	T1	1	Chalk & Talk
4	CO 4 :Analyze the Cloud Infrastructure Management and Migration and Disaster Management in Cloud.[K4]	**Unit 4:** Parsing Basic concepts				
		4.1	Parsing Basic concepts:	T1	1	Chalk & Talk
		4.2	top down and bottom up parsing	T1	2	Chalk & Talk
		4.3	treebank;	T1	2	Chalk & Talk
		4.4	Syntactic parsing:	T1	2	PPT
		4.5	CKY parsing;	T1	2	Chalk & Talk

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		4.6	Statistical parsing basics:	T1	2	Chalk & Talk
		4.7	Probabilistic Context Free Grammar (PCFG); Probabilistic	T1	2	Chalk & Talk
II ASSIGNMENT EXAMINATION						
4	CO4: Develop systems for various NLP problems with moderate complexity. [K4]	4.8	Probabilistic Context Free Grammar (PCFG); Probabilistic	T1	1	Chalk & Talk
		4.9	CKY Parsing of PCFGs.	T1	2	Chalk & Talk
		4.11	Wrap up class	T1	1	Chalk & Talk
5	CO5: Evaluate NLP systems, identify shortcomings and suggest solutions for these shortcomings. [K4]	Unit 5: Semantics Vector Semantics;				
		5.1	Semantics Vector Semantics;	T2	1	Chalk & Talk
		5.2	Words and Vector;	T2	1	Chalk & Talk
		5.3	Measuring Similarity;	T2	1	Chalk & Talk
		5.4	Semantics with dense vectors;	T2	1	Chalk & Talk
		5.5	SVD	T2	1	Chalk & Talk
		5.6	Latent Semantic Analysis;	T2	1	Chalk & Talk
		5.7	Skip-gram	T2	1	Chalk & Talk
		5.8	CBOW;	T2	1	Chalk & Talk
		5.9	Concept of Word Sense;	T2	1	Chalk & Talk
		5.10	Introduction to WordNet.	T2	1	Chalk & Talk
		5.11	Wrap classes	T2	1	Chalk & Talk
Total						

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MID II EXAMINATION		
END EXAMINATIONS		
Text Books:		
T1	Jurafsky Dan and Martin James H. "Speech and Language Processing", 3rd Edition, 2018.	
REFERENCE BOOKS		
R1	Jurafsky D. and Martin J. H., "Speech and language processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition", 2nd Edition, Upper Saddle River, NJ: Prentice-Hall, 2008.	
R2	Goldberg Yoav "A Primer on Neural Network Models for Natural Language Processing".	

ONLINE REFERENCES:

1. http://nptel.ac.in/courses/106106129/21
2. https://freevideolectures.com/course/3649/cloud-computing
3. https://www.youtube.com/watch?v=Eg4AAGCE7X4&list=PL2UlrhJ-JwyA5IlOCdEWlNArFke4jgtlg

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Department of IT

LESSON PLAN-AY: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/ Week	Sections
R20CC4102	HUMAN COMPUTER INTERACTION	IV-I	IT	6	A

COURSE OBJECTIVES: The main objective is to get student to think constructively and analytically about how to design and evaluate interactive technologies.

COURSE OUTCOMES:

CO 1: Outline knowledge about user interface design. [K2]
CO 2: Summarize the importance of Graphical User Interface. [K2]
CO 3: Apply the strategies used in design process. [K3]
CO 4: Summarize the importance of screen designing. [K2]
CO 5: Apply the various operations of Windows. [K3]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			Unit-1: Introduction			
1	**CO 1: Outline** knowledge about user interface design.	1.1	Importance of user Interface-definition	T1	2	Chalk & Talk
		1.2	importance of good design	T1	2	Chalk & Talk
		1.3	Benefits of good design	T1	2	Chalk & Talk
		1.4	A brief history of Screen design.	R1	2	T
			Unit-2: The graphical user interface			
2	**CO 2: Summarize** the importanee of Graphical User Interface.	2.2	the concept of direct manipulation	T1, T2	2	PPT
		2.3	graphical system, Characteristics	T1, T2	2	PPT
		2.4	Web user – Interface popularity	T1, T2	2	Chalk & Talk
		2.5	characteristics- Principles of user interface.	T1	2	Chalk & Talk
			Unit-3: Design process			

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3	3: **Apply** the strategies used in design process	3.1	Human interaction with computers	R1	3	PPT
		3.2	importance of human characteristics	T2, R1	3	PPT
		3.3	human consideration	T1	3	PPT
		3.4	Human interaction speeds	R1	3	PPT
MID I EXAMINATION DURING EIGTH WEEK						
		Unit-4: Screen Designing				
4	**CO 4: Summarize** the importance of screen designing	4.1	Design goals – Screen planning and purpose	T1, T2, R2	2	PPT
		4.2	organizing screen elements	R2	2	PPT
		4.3	ordering of screen data and content – screen navigation and flow	T2, R2	2	PPT
		4.4	Visually pleasing composition – amount of information	T1, T2	2	PPT
		4.5	focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics.	T1	2	PPT
		Unit 5:. Windows				
5	**CO 5: Apply** the various operations of Windows	5.1	New and Navigation schemes selection of window	T2, R2	2	Chalk & Talk
		5.2	selection of devices based and screen based controls	T1, T2	2	PPT
		5.3	Components – text and messages, Icons and increases	T1, T2	2	PPT
		5.4	Multimedia, colors	T2, R1	2	PPT
		5.5	uses problems, choosing colors	R1	2	T
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

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TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	1. Alan Dix, Janet Finlay, Goryd, Abowd, Russell Beal, "Human Computer Interaction", PEA, 3/e, 2004
T2	2. Wilbert O Galitz, "The Essential guide to user interface design", Wiley Dream tech, 2/e
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Dan R.Olsan, "Human Computer", Interaction Cengage ,2010.
R2	Ben Shneidermann , "Designing the user interface", 4/e, PEA.
R3	Soren Lauesen, "User Interface Design", PEA.
R4	Prece, Rogers, Sharps, "Interaction Design", Wiley

WEB RESOURCES	
1	https://en.wikipedia.org/wiki/Human+computer+interaction
2	https://www.interaction-design.org/literature/topics/human-computer-interaction
3	https://en.wikipedia.org/wiki/Human%E2%80%93computer_interaction
4	https://www.tutorialspoint.com/human_computer_interface/human_computer_interface_introduction.htm

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DEPARTMENT OF CSE(AI)
LESSON PLAN
Academic Year 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC3OE11	**DIGITAL MARKETING ((R20)**	IV/I	CSE(AI)	6	A

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO1: Develop insight on Current Trends – Digital and Social Statistics (Infographics) (K6)

CO2: Analyze the Digital Marketing Platforms like Face book, Twitter, YouTube etc.(K4)

CO3: Analyze the basics of Search Engine Optimization (SEO) and Mobile Marketing.(K4)

CO4: Design the various strategies involved in Marketing products and Services Digitally.(k6)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1. Develop insight on Current Trends – Digital and Social Statistics (Infographics) (K6)	**UNIT-1: Introduction to Digital Marketing**				
		1.1	Evolution of Digital Marketing from traditional	T1, T2, R1,R3	2	Chalk& Talk, PPT
		1.2	Role of Internet, Current trends, Digital landscape	T1, T2, R1,R3	2	Learning & Tutorial
		1.3	Info-graphics, Implications for business & society	T1, T2, R1,R3	1	Chalk& Talk,
		1.4	Emergence of digital marketing as a tool	T1, T2, R1,R3	1	Chalk&Talk, PPT
		1.5	Drivers of the new marketing environment	T1, T2, R1,R3	1	Chal&Talk,
		1.6	Revolutionizing the Traditional Business Network	T1, T2, R1,R3	1	Chalk&Talk, PPT
		1.7	Digital marketing plan, Digital marketing models	T1, T2, R1,R3	2	Learning & Tutorial
		1.8	Digital marketing strategy, P.O.E.M. framework	T1, T2, R1,R3	2	PPT, Flipped
2	CO 2.	**UNIT-2: Internet Marketing and Digital Marketing Mix**				

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	Analyze the Digital Marketing Platforms like Face book, Twitter, YouTube etc.(K4)	2.1	Internet Marketing, Opportunities and challenges	T1, T2, R1,R3	2	Chalk&Talk PPT Tutorial
		2.2	Digital marketing framework, Digital Marketing mix, Pay for Search Advertisements	T1, T2, R1,R3	2	Chalk& Talk PPT
		2.3	Impact of digital channels on IMC Search Engine Advertising Ad Placement, Ad Rank	T1, T2, R1,R3	2	Chalk& Talk, PPT, Tutorial
		2.4	Creating Ad Campaigns, Campaign Report Generation Display marketing, Types of Display Ads, Buying Models	T1, T2, R1,R3	2	Chalk& Talk PPT
		2.5	Programmable Digital Marketing, Analytical Tools and examples	T1, T2, R1,R3	2	Chalk&Talk
		2.6	YouTube marketing with examples	T1, T2, R1,R3	2	Chalk& Talk
3	CO 3. Analyze the basics of Search Engine Optimization (SEO) and Mobile Marketing.(K4)	**UNIT-3. Social Media Marketing**				
		3.1	Introduction to social media platforms, penetration & characteristics	T1, T2, R1,R3	2	Chalk& Talk, PPT, Blended Learning & Tutorial
		3.2	Building a successful social media marketing strategy, Face book Marketing	T1, T2, R1,R3	2	Chalk& Talk
		3.3	Business through Face book Marketing, creating Advertising Campaigns	T1, T2, R1,R3	2	Chalk& Talk
		3.4	Adverts, Face book Marketing Tools LinkedIn Marketing, Introduction and Importance of LinkedIn Marketing	T1, T2, R1,R3	2	Chalk&Talk PPT
		3.5	Framing LinkedIn Strategy, Lead Generation through LinkedIn	T1, T2, R1,R3	2	Chalk&Talk
		3.6	Content Strategy, Analytics and Targeting.	T1, T2, R1,R3	2	Chalk& Talk
MID I EXAMINATION DURING SIXTH WEEK						
4		**UNIT-4: Twitter Marketing**				

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	CO4: Design the various strategies involved in Marketing products and Services digitally.(k6)	4.1	Introduction to Twitter Marketing, how twitter Marketing is framing content strategy.	T1, T2, R1,R3	2	Chalk&Talk
		4.2	Twitter Advertising Campaigns, Instagram and Snapchat.	T1, T2, R1,R3	2	Chalk& Talk, PPT , Web Resources Tutorial
		4.3	Digital Marketing Strategies , Mobile Advertising	T1, T2, R1,R3	2	Chalk& Talk, PPT Tutorial
		4.4	Forms of Mobile Marketing	T1, T2, R1,R3	2	Chalk&Talk
		4.5	Features Mobile Campaign Development	T1, T2, R1,R3	2	Chalk&Talk
		4.6	Mobile Advertising Analytics.	T1, T2, R1,R3	2	Chal&Talk, students collaborative learning
5	CO5: Design the various strategies involved in Marketing products and Services digitally.(k6)	**UNIT – 5:Introduction to SEO**				
		5.1	Web Analytics, Mobile Marketing.	T1, T2, R1,R3	2	Chalk&Talk, PPT , Students Seminars &
		5.2	Trends in Digital Advertising, How to use internet &search engines	T1, T2, R1,R3	2	Chalk&Talk, Tutorial
		5.3	Search engine and its working pattern, On-page and off-page optimization	T1, T2, R1,R3	2	Chalk& Talk, PPT Chalk&Talk,
		5.4	SEO Tactics, Introduction to SEM Web Analytics, Google Analytics & Google AdWords	T1, T2, R1,R3	2	Chalk&Talk, PPT , Students Seminars & Tutorial
		5.5.	data collection for web analytics, multichannel attribution	T1, T2, R1,R3	2	Chalk&Talk,
		5.6	Trends in digital advertising.	T1, T2, R1,R3	2	Chalk&Talk, PPT
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

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TEXT BOOKS:
T1:Seema Gupta, Digital Marketing, Mc-Graw Hill, 1st Edition- 2017
T2:Ian Dodson, The Art of Digital Marketing, Wiley Latest Edition
T3:Puneet Singh Bhatia, Fundamentals of Digital Marketing, Pearson, 1st Edition – 2017
REFERENCE BOOKS:
R1:Vandana Ahuja, Digital Marketing, Oxford University Press, Latest Edition
R2.:Philip Kotler, Marketing 4.0: – Moving from Traditional to Digital, Wiley 2017
R3:Melissa S. Barker |Donald I. Barker | Nicholas F. Bormann | Debra Zahay | Mary Lou Roberts, Social Media Marketing: AStrategic Approach, Cengage Latest Edition
R4:Ward Hanson , Kirthi Kaly anam, Internet Marketing & e-Commerce Cengage Latest Edition

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NEC	**Narasaraopeta Engineering College: Narasaraopet** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601**

DEPARTMENT OF CSE (ARTIFICIAL INTELLIGENCE)
LESSON PLAN A.Y:2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC4OE09	CYBER SECURITY	I	CSE (ARTIFICIAL INTELLIGENCE)	6	A

COURSE OUTCOMES: After completion of this course, the students would be able to

CO1: Analyze classification of cybercrime and how criminals plan cybercrimes [K4]
CO2: Explain various methods of using Mobile and Wireless devices in cybercrimes. [K2]
CO3: Analyze the tools and methods used in Cyber Crime [K4]
CO4: Explain about various Phishing Techniques [K2]
CO5: Analyze the legal perspective of cybercrime and cyber security. [K4]
CO6: Explain fundamental concepts challenges of cyber forensics and how cyber forensics are used in cybercrime investigation. [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1. Summarize different phases and passes of a compiler.(K2)		**Unit-1. Introduction to Cybercrime:**			
		1.1	Introduction, Cybercrime: Definition and Origins of the Word,	T1, T2	2	Chalk & Talk
		1.2	Cybercrime and Information Security, Who are Cybercriminals? Classifications of Cybercrimes.	T1, T2	2	Chalk & Talk
		1.3	Cybercrime: The Legal Perspectives	T1, T2, R1	1	Chalk & Talk
		1.4	Cybercrimes: An Indian Perspective, Cybercrime and the Indian ITA 2000	T1, T2	2	Chalk & Talk
		1.5	A Global Perspective on Cybercrimes, Cybercrime Era: Survival Mantra for the Netizens.	T1, T2	1	PPT
		1.6	Cyber offenses: How Criminals Plan Them –Introduction	T1, T2, R1	1	Chalk & Talk
		1.7	How Criminals Plan the Attacks, Social Engineering	T1, T2	1	Chalk & Talk
		1.8	Cyber stalking, Cyber cafe and Cybercrimes	T1, T2, R1	2	Chalk & Talk
ASSIGNMENT I EXAMINATION						
2			**Unit-2.** Cybercrime Mobile and Wireless Devices			
		2.1	Introduction, Proliferation of Mobile and Wireless Devices	T1, T2	2	Chalk & Talk
		2.2	Trends in Mobility, Credit Card Frauds in Mobile and Wireless Computing Era	T1, T2	2	PPT
		2.3	Security Challenges Posed by Mobile Devices, Registry Settings for Mobile	T1, T2	2	Chalk & Talk

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CO2: Identifying System and application security threats and vulnerabilities [K3]		Devices, Authentication Service Security				
	2.4	Attacks on Mobile/Cell Phones, Mobile Devices: Security Implications for Organizations	T1, T2	2	Chalk & Talk
	2.5	Organizational Measures for Handling Mobile, Organizational Security	T1, T2, R1	2	Student Seminar
	2.6	Policies and Measures in Mobile Computing Era, Laptops.	T1, T2	1	Chalk & Talk
CO3: Identifying different classes of attacks [K3].		**Unit-3.** Tools and Methods Used in Cybercrime			
	3.1	Introduction, Proxy Servers and Anonymizers	T1, T2, R1	1	Chalk & Talk
	3.2	Phishing, Password Cracking, Key loggers and Spywares	T1, T2	2	Chalk & Talk
	3.3	Virus and Worms, Trojan Horses and Backdoors	T1, T2	1	Chalk & Talk
	3.4	Steganography	T1, T2, R1	2	Chalk & Talk
	3.5	DoS and DDoS Attacks	T1, T2	1	Student Seminar
	3.6	SQL Injection, Buffer Overflow, Attacks on Wireless Networks	T1, T2, R1	1	Chalk & Talk
	3.7	Phishing and Identity Theft: Introduction	T1, T2	2	PPT
	3.8	Phishing, IdentityTheft (IDTheft)	T1, T2	1	PPT
MID I EXAMINATION					
CO4: Cyber Security incidents to apply appropriate response [K3].		**Unit-4.** Cybercrimes and Cyber security:			
	4.1	Why Do We Need Cyber laws	T1, T2	1	Chalk & Talk,
	4.2	The Indian Context, The Indian IT Act	T1, T2	2	Chalk & Talk,
	4.3	Challenges to Indian Law and Cybercrime Scenario in India	T1	1	Chalk & Talk,
	4.4	Consequences of Not Addressing the Weakness in Information Technology Act	T1	2	Chalk & Talk,
	4.5	Digital Signatures and the Indian IT Act	T2	2	PPT
	4.6	Information Security Planning and Governance	T1, T2	1	Chalk & Talk,
	4.7	Information Security Policy Standards, Practices	T1, T2	1	Chalk & Talk,
	4.8	The information Security Blueprint	T1	1	Chalk & Talk,
	4.9	Security education, Training and awareness program	T2	1	Chalk & Talk,
	4.10	Continuing Strategies	T1	1	Chalk & Talk
ASSIGNMENT II EXAMINATION					

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		Unit 5: Understanding Computer Forensics				
		5.1	Introduction, Historical	T1, T2	1	Chalk & Talk
		5.2	Background of Cyber forensics, Digital Forensics Science	T1, T2	1	PPT
		5.3	The Need for Computer Forensics, Cyber forensics and Digital Evidence	T1	1	Chalk & Talk
		5.4	Forensics Analysis of E-Mail, Digital Forensics Life Cycle	T1	2	Chalk & Talk
		5.5	Chain of Custody Concept, Network Forensics	T1, T2	1	Chalk & Talk
	CO5: Describing risk management processes and practices [K3].	5.6	Approaching a Computer Forensics Investigation	T1, T2	1	Chalk & Talk
		5.7	Computer Forensics and Steganography	T1, T2	1	Chalk & Talk
5	CO6: Evaluation of decision-making outcomes of Cyber Security scenarios [K4].	5.8	Relevance of the OSI 7 Layer Model to Computer Forensics	T1, T2, R1	1	Seminar
		5.9	Forensics and Social Networking Sites: The Security/Privacy Threats	T1, T2, R1	1	Chalk & Talk
		5.10	Computer Forensics from Compliance Perspective	T1, T2, R1	2	Chalk & Talk
		5.11	Challenges in Computer Forensics	T1, T2, R1	1	Chalk & Talk
		5.12	Special Tools and Techniques	T1	1	Chalk & Talk
		5.13	Forensics Auditing	T2	1	PPT
		5.14	Antiforensics.	T1, T2	1	Chalk & Talk
		MID II EXAMINATION				
		END EXAMINATIONS				

ext Books:

1 1.Cyber Security: Understanding Cyber Crimes, Computer Forensics and LegalPerspectives, Nina Godbole, SunitBelapure, Wiley

2 2. Principles of Information Security, MichealE.Whitman and Herbert J.Mattord, Cengage Learning.

eference Books:

1 Information Security, Mark Rhodes, Ousley, MGH.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF CSE(AI)
LESSON PLAN A.Y:2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC4OE016	E-COMMERCE	IV-1	CSE(AI)	6	1

COURSE OUTCOMES:

After completion of this course, the students would be able to

CO 1: Interpret the E-commerce applications and Process Model. [K2]

CO 2: Compare and contrast various electronic Payment Systems. [K3]

CO 3: Interpret the Intra Organizational Commerce. [K2]

CO 4: Outline the corporate digital library and marketing research. [K2]

CO 5: Analyze resource discovery and information filtering. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT-I			
1	CO1: Interpret the E-commerce applications and Process Model. [K2].	1.1	Electronic Commerce-Framework	T1	2	Chalk & Talk
		1.2	anatomy of E-Commerce applications	T1	2	Chalk & Talk
		1.3	E-CommerceConsumer applications	T1	3	PPTS
		1.4	E-Commerce organization applications	T1	3	Chalk & Talk,
			UNIT-II			
2	CO2: Compare and contrast various electronic Payment Systems. [K3]	2.1	Consumer Oriented Electronic commerce	T1	2	Chalk & Talk
		2.2	Mercantile Process models.	T1	2	students seminar
			1st MID EXAMINATION			
		2.3	Electronic payment systems	T1, R1	3	Chalk & Talk
		2.4	Risks in Electronic payment systems	T1, R1	3	Chalk & Talk
			UNIT-III			
3	CO3: Interpret the Intra Organizational Commerce. [K2]	3.1	Intra Organizational Commerce	T', R3	3	Chalk & Talk
		3.2	Automation Customization	T1, R3	5	Chalk & Talk
		3.3	.InternalCommerce	T1, R3	2	Chalk & Talk
		3.4	Supply chain Management	T1,, R1	3	PPTS

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			UNIT-IV			
4	CO 4: Outline the corporate digital library and marketing research. [K2]	4.1	Corporate Digital Library	T1,R1	2	Chalk & Talk
		4.2	Document Library, digital Document types	T1,T2	2	Chalk & Talk
		4.3	corporate DataWarehouses.	T1,R1	2	Chalk & Talk
		4.4	Advertising and Marketing	T1, R1	2	Chalk & Talk
		4.5	Information based marketing	T1, R1	2	Chalk & Talk
		4.6	Advertising on Internet	T1, R1	2	Chalk & Talk
		4.7	on-linemarketing process, market research.	T1, R1	2	PPTS
5	CO 5: Analyze resource discovery and information filtering. [K4]]		UNIT-V			
		5.1	Consumer Search and Resource Discovery	T1, R1	3	Chalk & Talk
		5.2	Information search and Retrieval	T1, R1	3	Chalk & Talk
		5.3	CommerceCatalogues	T1, R1	2	Chalk & Talk
		5.4	Information Filtering	T1,, R1	2	Chalk & Talk
		5.5	Digital Video and electronic Commerce	T1,, R1	2	Chalk & Talk
				Total	**60**	
			2nd MID EXAMINATION			
			SEMESTER EXAMINATION			

TEXT BOOKS :

T1: Kalakata, Whinston, "Frontiers of electronic commerce", Pearson.

REFERENCE BOOKS :

R1. Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley, "E-Commerce fundamentals and applications"

R2. S.Jaiswal – Galgotia, "E-Commerce".

R3. Efrain Turbon, Jae Lee, David King, H.Michael Chang, "E-Commerce".

R4. Gary P.Schneider, "Electronic Commerce", Thomson.

R5. E-Commerce – Business, Technology, Society, Kenneth C.Taudon, Carol Guyerico Traver.

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DEPARTMENT OF CSE(AI)
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R20CC4117	E&I (R20)	IV-I	CSE(AI)	5	A

COURSE OUTCOMES: Student is able to

CO1 : Outline the concepts of Entrepreneurship.[K2]
CO2 : Create the awareness on creativity and innovation.[K6]
CO3 : Adopt the Entrepreneurship Development programs[K6]
CO4 : Evaluate the project planning and feasibility studies.[K5]
CO5 : Analyze the concept of small and micro enterprises.[K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Outline the concepts of Entrepreneurship.[K2]		**Unit-1. Entrepreneur And Entrepreneurship**			
		1.1	Entrepreneur – Definitions, concept of entrepreneur	T1, R1	1	Chalk & Talk
		1.2	characteristics of entrepreneur, types of entrepreneurs	T1, R1	2	Chalk & Talk,PPT
		1.3	concept of entrepreneurship, characteristics of entrepreneurship	T1, R1	2	Chalk & Talk
		1.4	role of entrepreneurship in economic development	T1,R1	1	Chalk & Talk
		1.5	ethics and social responsibilities of an entrepreneur	T1,R1	2	Chalk & Talk,PPT
		1.6	Financial institutional support to entrepreneurs(IDBI,SISI,DIC,NIESBUD, Commercial banks etc.,	T1,R1	2	Chalk & Talk,PPT
2	CO2: Create the awareness on creativity and innovation.[K6]		**Unit-2. Creativity And Innovation In Entrepreneurship**			
		2.1	Meaning and concept of creativity - Nature and characteristics of creativity	T1, R1	2	Chalk & Talk,PPT
		2.2	Creativity Process- Factors affecting creativity	T1, R1	2	Chalk & Talk
		2.3	Meaning and Importance Innovation - Process	T1, R1	2	Chalk & Talk,PPT
		2.4	Distinguish the Creativity and Innovation.	T1, R1	2	Chalk & Talk
3	CO3: Adopt the Entrepreneurship Development programs[K6]		**Unit-3. Entrepreneurship Development Programmes**			
		3.1	Designing Appropriate Training Programme to inculcate Entrepreneurial Spirit	T1, R1	2	Chalk & Talk
		3.2	Training for Entrepreneurs, Entrepreneurship Development Programme (EDP)	T1, R1	2	Chalk & Talk,PPT
		3.3	Need and objectives of EDP's	T1, R1	2	Chalk & Talk
			MID I EXAMINATION			
		3.4	Phases and evolution on EDP's existing and new Entrepreneurs.	T1, R1	2	Chalk & Talk,PPT

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		Unit-4. Project Planning And Feasibility Studies				
	CO4: Evaluate the project planning and feasibility studies.[K5]	4.1	Meaning of a project, Project identification – Sources of new Ideas	T2, R2	3	Chalk & Talk
		4.2	Methods of generating ideas, Project selection,	T2, R2	2	Chalk & Talk,PPT
		4.3	Project Feasibility Study -Project evaluation and Techniques	T2, R2	3	Chalk & Talk
		4.4	(PBP, ARR, NPV, IRR & PI).	T2, R2	4	Chalk & Talk
		Unit 5. Small And Micro Enterprises				
5	CO5:Analyze the concept of small and micro enterprises.[K4]	5.1	Importance, definitions, MSME's Development Act 2006	T2, R2	2	Chalk & Talk,PPT
		5.2	policies and their support to MSMEs	T2, R2	2	Chalk & Talk
		5.3	Growth of Firm and growth strategies,	T2, R3	2	Chalk & Talk
		5.4	Factors inducing growth	T2, R2	2	Chalk & Talk,PPT
		5.5	Sickness in small business and remedies.	T2, R3	2	Chalk & Talk
				Total	50	
	MID II EXAMINATION DURING SIXTEENTH WEEK					
	END EXAMINATIONS					

Text Books:

T1 "Entrepreneurship", Arya Kumar: Pearson, Publishing House, New Delhi, 2012.
T2 "Entrepreneurship', VSP Rao, Kuratko: Cengage Learning, New Delhi,2012
T3 ShoimoMaital, DVR Seshadri, "Innovation Management", Response Books 2007

Reference Books:

R1 "Entrepreneurship Development" B.Janakiram, M Rizwana: Excel Books, ND, 2011
R2 "Entrepreneurship Development", P.C.Shejwalkar Everest Publishing House, ND, 2011

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Department of CSE(AI)

LESSON PLAN-AY: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/ Week	Sections
R20CC4102	HUMAN COMPUTER INTERACTION	IV-I	CSE(AI)	6	A

COURSE OBJECTIVES: The main objective is to get student to think constructively and analytically about how to design and evaluate interactive technologies.

COURSE OUTCOMES:

CO 1: Outline knowledge about user interface design. [K2]
CO 2: Summarize the importance of Graphical User Interface. [K2]
CO 3: Apply the strategies used in design process. [K3]
CO 4: Summarize the importance of screen designing. [K2]
CO 5: Apply the various operations of Windows. [K3]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			Unit-1: Introduction			
1	**CO 1: Outline** knowledge about user interface design.	1.1	Importance of user Interface-definition	T1	2	Chalk & Talk
		1.2	importance of good design	T1	2	Chalk & Talk
		1.3	Benefits of good design	T1	2	Chalk & Talk
		1.4	A brief history of Screen design.	R1	2	T
			Unit-2: The graphical user interface			
2	**CO 2: Summarize** the importance of Graphical User Interface.	2.2	the concept of direct manipulation	T1, T2	2	PPT
		2.3	graphical system, Characteristics	T1, T2	2	PPT
		2.4	Web user – Interface popularity	T1, T2	2	Chalk & Talk
		2.5	characteristics- Principles of user interface.	T1	2	Chalk & Talk
			Unit-3: Design process			

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3	3: **Apply** the strategies used in design process	3.1	Human interaction with computers	R1	3	PPT
		3.2	importance of human characteristics	T2, R1	3	PPT
		3.3	human consideration	T1	3	PPT
		3.4	Human interaction speeds	R1	3	PPT
MID I EXAMINATION DURING EIGTH WEEK						
		Unit-4: Screen Designing				
4	**CO 4: Summarize** the importance of screen designing	4.1	Design goals – Screen planning and purpose	T1, T2, R2	2	PPT
		4.2	organizing screen elements	R2	2	PPT
		4.3	ordering of screen data and content – screen navigation and flow	T2, R2	2	PPT
		4.4	Visually pleasing composition – amount of information	T1, T2	2	PPT
		4.5	focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics.	T1	2	PPT
		Unit 5:. Windows				
5	**CO 5: Apply** the various operations of Windows	5.1	New and Navigation schemes selection of window	T2, R2	2	Chalk & Talk
		5.2	selection of devices based and screen based controls	T1, T2	2	PPT
		5.3	Components – text and messages, Icons and increases	T1, T2	2	PPT
		5.4	Multimedia, colors	T2, R1	2	PPT
		5.5	uses problems, choosing colors	R1	2	T
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

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TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	1. Alan Dix, Janet Finlay, Goryd, Abowd, Russell Beal, "Human Computer Interaction", PEA, 3/e, 2004
T2	2. Wilbert O Galitz, "The Essential guide to user interface design", Wiley Dream tech, 2/e
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Dan R.Olsan, "Human Computer", Interaction Cengage ,2010.
R2	Ben Shneidermann , "Designing the user interface", 4/e, PEA.
R3	Soren Lauesen, "User Interface Design", PEA.
R4	Prece, Rogers, Sharps, "Interaction Design", Wiley

WEB RESOURCES	
1	https://en.wikipedia.org/wiki/Human+computer+interaction
2	https://www.interaction-design.org/literature/topics/human-computer-interaction
3	https://en.wikipedia.org/wiki/Human%E2%80%93computer_interaction
4	https://www.tutorialspoint.com/human_computer_interface/human_computer_interface_introduction.htm

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DEPARTMENT OF CSE (AI)

LESSON PLAN/A.Y:: 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20AI4107	ARTIFICIAL NEURAL NETWORKS (R20)	1	CSE (AI)	6	--

COURSE OUTCOMES:

After successful completion of this course, students will be able to:

CO1: Summarize the similarity of Biological networks and Neural networks.[K2]

CO2: Organize the training of neural networks using various learning rules.. [K3]

CO3: Analyze the concepts of forward and backward propagations.[K4]

CO4: Analyze and Construct the Hopfield models.[K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO 1.** Summarize the similarity of Biological networks and Neural networks.[K2]		**Unit-1. Introduction**			
		1.1	A Neural Network, Human Brain, Models of a Neuron	T1, T2, R1	2	Chalk & Talk
		1.2	Neural Networks viewed as Directed Graphs, Network Architectures	T1, T2, R1	2	Chalk & Talk
		1.3	Error Correction Learning, Memory Based Learning	T1, T2, R1	2	Chalk & Talk
		1.4	Hebbian Learning, Competitive, Boltzmann Learning, Credit Assignment Problem	T1, T2, R2	2	Chalk & Talk
		1.5	Memory, Adaption, Statistical Nature of the Learning Process	T1, T2, R1	2	PPT
ASSIGNMENT I EXAMINATION						
2	**CO2:** Organize the training of neural networks using various learning rules. [K3]		**Unit-2. Single Layer Perceptrons**			
		2.1	Adaptive Filtering Problem, Unconstrained Organization Techniques, Linear Least Square Filters	T1, T2, R2	2	Chalk & Talk
		2.2	Least Mean Square Algorithm, Learning Curves, Learning Rate Annealing Techniques	T1, T2, R2	2	PPT
		2.3	Perceptron –Convergence Theorem, Relation Between Perceptron and Bayes Classifier for a Gaussian Environment	T1, T2, R2	2	Flipped Learning
		2.4	Multilayer Perceptron: Back Propagation Algorithm XOR Problem	T1, T2, R3	2	Web Resource
		2.5	Heuristics, Output Representation and Decision Rule	T1, T2, R3	2	Student Seminar
		2.6	Computer Experiment, Feature Detection	T1, T2, R3	1	Chalk & Talk

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3	CO3: Analyze the concepts of forward and backward propagations.[K4]	**Unit-3. Back Propagation**				
		3.1	Back Propagation and Differentiation	T1, T2, R1	2	Chalk & Talk
		3.2	Hessian Matrix	T1, T2, R1	2	Chalk & Talk
		3.3	Generalization	T1, T2, R1	2	Chalk & Talk
		3.4	Cross Validation	T1, T2, R1	2	Chalk & Talk
	MID I EXAMINATION					
	CO3: Analyze the concepts of forward and backward propagations.[K4]	3.5	Network Pruning Techniques,	T1, T2, R1	1	Student Seminar
		3.6	Virtues and Limitations of Back Propagation Learning	T1, T2, R1	1	Chalk & Talk
		3.7	Accelerated Convergence	T1, T2, R1	2	PPT
		3.8	Supervised Learning	T1, T2, R1	1	PPT
4	CO3: Analyze the concepts of forward and backward propagations.[K4]	**Unit-4. Self-Organization Maps (SOM)**				
		4.1	Two Basic Feature Mapping Models	T1, T2, R3	1	Chalk & Talk,
		4.2	Self-Organization Map, SOM Algorithm	T1, T2, R3	1	Chalk & Talk,
		4.3	Properties of Feature Map, Computer Simulations	T1, T2, R3	1	Chalk & Talk,
		4.4	Learning Vector Quantization, Adaptive Patter Classification.	T1, T2, R3	2	Chalk & Talk,
	ASSIGNMENT II EXAMINATION					
5	CO4: Analyze and Construct the Hopfield models.[K4]	**Unit 5. Neuro Dynamics**				
		5.1	Dynamical Systems	T1, T2, R3	1	Chalk & Talk
		5.2	Stability of Equilibrium States	T1, T2, R3	1	PPT
		5.3	Attractors,	T1, T2, R3	1	Active Learning & Seminars
		5.4	Neuro Dynamical Models	T1, T2, R2	2	Chalk & Talk,
		5.5	Manipulation of Attractors as a Recurrent Network Paradigm	T1, T2, R2	1	Chalk & Talk,
		5.6	Hopfield Models,	T1, T2, R3	2	Chalk & Talk,
		5.7	restricted boltzmen machine	T1, T2, R3	1	Chalk & Talk,
	MID II EXAMINATION					
	END EXAMINATIONS					

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Text Books:

1. **Neural Networks a Comprehensive Foundations, Simon S Haykin, PHI Ed.,.**
2. **Introduction to Artificial Neural Systems Jacek M. Zurada, JAICO Publishing House Ed. 2006**
3. **Artificial Neural Networks by Ivan Nunes da Silva, Danilo Hernane Spatti, Rogerio Andrade Iauzino, Luisa Helena Bartocci Liboni, Silas Franco dos Reis Alves**

Reference Books:

R1 Neural Networks in Computer Inteligance, Li Min Fu TMH 2003
R2 Neural Networks -James A Freeman David M S Kapura Pearson Ed., 2004.
R3 Artificial Neural Networks – B. Vegnanarayana Prentice Hall of India P Ltd 2005

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda (Post), Narasaraopet- 522601

DEPARTMENT OF CSE(AI)
LESSON PLAN AY:2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/ Week	Sections
R20AI3105	MACHINE LEARNING	III-I	CSE(AI)	6	A

COURSE OUTCOMES: Students are able	Course Outcome Statement No.
CO1	Summarize the characteristics of to Machine Learning that make it useful to real-world Problems. [K2]
CO2	Outline the need and importance of pre-processing techniques and apply them. [K2]
CO3	Evaluate and compare the performance of different unsupervised algorithms for typical learning problems and apply them. [K5]
CO4	Analyze the performance of Association Rules. [K4]
CO5	Evaluate and compare the performance of different supervised algorithms for typical learning problems and apply them. [K5]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Summarize the characteristics of Machine learning that make it useful to real-world problems. [K2]	**Unit-1** Definition of learning systems, Goals and applications of machine learning				
		1.1	Definition of learning systems, Goals and applications of machine learning	T1, R1	3	Chalk & Talk
		1.2	Supervised Learning: Learning a Class from Examples	T1, R1	3	
		1.3	Vapnik Chervonenkis (VC) Dimension, Probably Approximately Correct (PAC) Learning	T1, R1	3	PPT
		1.4	Learning Multiple Classes	T1, R1	3	NPTEL
		1.5	Regression, Model Selection and Generalization	T1, R1		
		1.6	Dimensions of a Supervised Machine Learning Algorithm..	T1, R1	3	
2	CO2: Outline the need and importance of pre-processing techniques and apply them. [K2]	**Unit-2** Bayesian Decision Theory				
		2.1	Classification, Losses and Risks, Discriminant Functions	T1, R1	3	Chalk & Talk
		2.2	Utility Theory, Association Rules. Parametric Methods: Maximum Likelihood Estimation	T1, R1	4	PPT& Tutorial & NPTEL/
		2.3	Evaluating an Estimator: Bias and Variance,	T1, R1	3	MOOCS
		2.4	The Bayes' Estimator, Parametric Classification, Regression	T1, R1		

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		2.5	Tuning Model Complexity: Bias/Variance Dilemma, Model Selection Procedures	T1, R1	3	
		2.6	Tuning Model Complexity: Bias/Variance Dilemma, Model Selection Procedures	T1, R1		
	Knowledge Representation Using Predicate Logic	**Unit-3** Dimensionality Reduction				
3	Evaluate and compare the performance of different unsupervised algorithms for typical learning problems and apply them. [K5]	3.1	Subset Selection, Principal Components Analysis	T1, T2, R2	3	Chalk & Talk PPT& Tutorial.
		3.2	Factor Analysis, Multidimensional Scaling	T1, R2	3	
		3.3	Linear Discriminant Analysis Association learning: Basics of Association,	T1,R2	2	
		MID I EXAMINATIONS				
		Unit-3 Algorithm				
		3.4	Apriori Algorithm, Eclat Algorithm	T2, R1	2	Chalk & Talk
		3.5	FP Growth Algorithm with examples.	T2, R1	2	
		3.6	SCADA application with FP Growth Algorithm	T2, R1	2	PPT& Tutorial.
4	**CO4:** Analyze the performance of Association Rules. [K4]	**Unit-4** Unsupervised Learning				
		4.1	Expectation Maximization	T2, R2	3	Chalk Talk
		4.2	Self-Organizing Maps(SOM),learning Process in SOM	T2, R2	3	PPT
		4.3	Algorithm: SOM, Adaptive Resonance Theory	T2, R2	3	Tutorial NPTEL/
		4.4	Clustering: k-Means Clustering, Expectation-Maximization Algorithm, Supervised Learning after Clustering	T2, R2	3	MOOCS
		4.5	Fuzzy Clustering, Document Clustering example, Hierarchical Clustering, Choosing the Number of Clusters	T2, R1	3	
5	**CO5:** Evaluate and compare the performance of different supervised algorithms for typical learning problems and apply them. [K5]	**Unit-5** Decision Tree Learning:				
		5.1	V Decision Trees Univariate Trees, Pruning, Rule Extraction from Trees	T2, R2	4	Chalk & Talk
		5.2	Learning Rules from Data	T2, R2	4	PPT& Tutorial & NPTEL/ MOOCS
		5.3	Random Forest: basic Principle	T2, R2		
		5.4	Decision Tree vs random Forest, Random Forest Algorithm with Example	T2, R2	1	
		5.5	Decision Tree vs random Forest, Random Forest Algorithm with Example	T2, R2	1	
				Total	75	
MID II EXAMINATIONS						
END EXAMINATIONS						

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TEXT BOOKS	
T	BOOK TITLE/AUTHORS/PUBLISHER
T1	1.. Ethem Alpaydin, "Introduction to Machine Learning", The MIT Press, 2010 2. Artificial Intelligence and Machine Learning, by Vinod Chandra PHI Learning.
T2	3. Aurélien Géron, "Handson machine learning with scikit learn and tensorflow" O'REILLY
REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Stephen Marsland, "Machine Learning an Algorithmic Perspective", CRC Press, 2009.
R2	Patrick Henry Winston, 'Artificial Intelligence', Pearson Education, 2003 3. Russel and Norvig, 'Artificial Intelligence', Pearson Education, PHI, 2003

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DEPARTMENT OF CSE (ARTIFICIAL INTELLIGENCE)
LESSON PLAN A.Y (2024-2025)

Course Code	Course Title (Regulation)	Year	Sem	Branch	Contact Periods/Week	Sections
R20CC1OE16	COMPUTER ORGANIZATION	III	I	CSE(AI)	5	A

COURSE OUTCOMES: After completion of this course ,the students would be able to

CO 1: Interpret the computer system from user's perspective and can explain how Arithmetic Logic Unit Works[K2].

CO 2: Explain of basic components of the system and illustrate data paths and control flow for sequencing in CPUs [K2].

CO 3 : Interpret the Micro operations and Microprogramming for design of control unit of CPU. [K2]

CO 4: Develop Main Memory Interfacing Circuit and can apply various cache memory mapping techniques[K3].

CO 5: Apply algorithms to perform arithmetic operations on binary representation of fixed point data [K3].

CO 6: Interpret various I/O interface devices [K2].

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1:**Interpret the computer system from users perspective and can explain how Arithmetic Logic unit works[K2]	**Unit-1. INTRODUCTION Register Transfer and Micro-operations**				
		1.1	Types of Computers, Functional units of Basic Computer (Block diagram of Micro Computer).	T1, R2	2	Chalk & Talk,
		1.2	Register Transfer language, Register Transfer, Bus and memory transfers - Three-State Bus Buffers.	T1, R2	3	Chalk & Talk,
		1.3	Memory Transfer; Arithmetic micro operations,BinaryAdder,Binary Adder-Subtractor,Binary Incrementer.	T1	3	Chalk & Talk,
		1.4	Arithmetic Circuit, Logical micro operations- List of Logic Micro operations,-H/W.Implementation, Some Applications	T1, R2	2	PPT
		1.5	Shift micro operations-Hardware Implementation, Arithmetic logic shift unit.	T1	2	Chalk & Talk,
2	**CO2:**Explain The Basic Components Of The System And Illustrate Data Paths And Control Flow For Sequencing in CPUs[K2]	**Unit-2. Basic Computer Organization and Design**				
		2.1	Instruction codes – Stored Program Organization, Indirect Address, Computer Registers – Common Bus Systems, Computer instructions – Instruction Set Completeness, Timing and control,	T1, R2	3	Chalk & Talk,
		2.2	Instruction cycle – Fetch and Decode, Determine the Type of Instruction, Register Reference Instructions,	T1, R2	3	Chalk & Talk,

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		2.3	Memory – Reference Instructions – AND to AC, ADD to AC, LDA :Load to AC,STA: Store AC, BUN: Branch Unconditionally, BSA: Branch and Save Return Address, ISZ: Increment and Skip if Zero,	T1,R2	3	PPT
		2.4	Control Flow Chart, Input – Output Instructions and Interrupt – Input – Output Configuration, Input-Output Instructions.	T1,R2	3	Active Learning.
MID I EXAMINATION DURING SIXTH WEEK						
3	**CO3:** Interpret the Micro operations and Microprogramming for Design of control unit of CPU. [K2]	**Unit-3. Central Processing Unit and Micro Programmed Control Unit**				
		3.1	Instruction formats – Three Address Instructions, Two Address Instructions, One Address Instructions, Zero Address Instructions, RISC Instructions, Addressing modes – Numerical Example.	T1, R2	2	Chalk & Talk,
		3.2	Data Transfer and manipulation – Data Transfer Instructions, Data Manipulation Instructions, Arithmetic Instructions, Logical and Bit Manipulation Instructions, Shift Instructions	T1	2	QUIZ
		3.3	Program control – Status Bit Conditions, Conditional Branch Instructions, Subroutine Call and Return, Program Interrupt, Types of Interrupts, Reduced Instruction Set Computer – CISC Characteristics, RISC Characteristics.	T1	2	STUDENT SEMINAR
		3.4	**Micro Programmed Control Unit:** Control memory, Address sequencing – Conditional Branching, Mapping of Instructions, Subroutines, Micro program example – Computer Configuration	T1	2	Chalk & Talk, PPT
		3.5	Microinstruction Format, Symbolic Microinstructions, The Fetch Routine, Symbolic Micro program, Design of control unit – Micro program Sequencer.	T1	3	NPTEL
		3.6	Numerical Problems	T1	1	PPT
4	**CO4:** : Develop Main Memory Interfacing Circuit and can apply various cache memory mapping techniques[K3]	**Unit- The Memory System:**				
		4.1	Memory Hierarchy, Main memory - RAM and ROM Chips, Memory Address Maps, Memory Connection to CPU, Auxiliary memory – Magnetic Disks, Magnetic Tape,	T1	2	Chalk & Talk,
		4.2	Associative Memory – Hardware Organization, Match Logic	T1	2	PPT
		4.3	Cache Memory – Associative Mapping, Direct Mapping, Set-Associative Mapping, Writing into Cache.	T1	3	Chalk & Talk,

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		4.4	**Computer Arithmetic:** Addition and subtraction – Addition and Subtraction with Signed Magnitude Data,	T1	2	Active Learning.
		4.5	Hardware Implementation, Hardware Algorithm, Addition and Subtraction with Signed 2's Complement Data, Multiplication Algorithms –Booth Multiplication Algorithm	T1	3	PPT
5	**CO5:** Apply algorithms to perform arithmetic operations on binary representation of fixed point data[K3]. **CO6:** Interpret various I/O Interface Devices [K2].	**Unit 5. Input-Output Organization**				
		5.1	**Input-Output Organization:** Peripheral Devices – ASCII Alphanumeric Characters, Input Output Interface – I/O Bus and Interface Modules, I/O vs Memory Bus,	T1,R2	3	Chalk & Talk, PPT
		5.2	Isolated vs Memory Mapped I/O, Example of I/O Interface, Asynchronous data transfer – Strobe Control, Handshaking, Asynchronous Serial Transfer,	T1,R2	3	NPTEL
		5.3	Modes of Transfer – Example of Programmed I/O, Interrupt Initiated I/O, Priority Interrupts – Daisy Chaining Priority, Parallel Priority Interrupt,	T1, R2	3	PPT
		5.4	Priority Encoder, Interrupt Cycle, Direct memory Access – DMA Controller, DMA Transfer.	T1, R2	3	PPT
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	1. M. Morris Mano, "Computer System Architecture", Third Edition, Pearson.2008
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky, "Computer Organization", McGraw Hill, 5/e. 2002.
R2	2. William Stallings, "Computer Organization and Architecture", Pearson 6/e, 2006.

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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601** **DEPARTMENT OF CSE (Artificial Intelligence)**

DEPARTMENT OF CSE (Artificial Intelligence)
LESSON PLAN AY: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC3104	Computer Networks	III/I	CSE-AI	5	A

COURSE OUTCOMES: Students are able to

S. No.	Course Outcome Statement
CO1	Summarize basic concepts of Data Communication and Networking. [K2]
CO2	Compare and Contrast OSI and TCP/IP reference models. [K2]
CO3	Interpret data link layer services and multiple access protocols. [K2]
CO4	Analyze different routing protocols. [K4]
CO5	Illustrate the essential principles of different transport layer protocols. [K2]
CO6	Summarize various application layer protocols. [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Summarize basic concepts of Data Communication and Networking.		**UNIT-1 Introduction**			
		1.1	OSI Overview TCP/IP and Other Network Models,	T1	6	Chalk & Talk
		1.2	Examples of Networks: Novell Networks, Arpanet, Internet,	T1	4	Chalk & Talk
		1.3	Network Topologies: WAN, LAN, MAN.	T1	4	Chalk & Talk
2	CO2: Compare and Contrast OSI and TCP/IP reference models. CO3: Interpret data link layer services and multiple access protocols		**UNIT-2. Data Link Layer**			
		2.1	Design Issues- Framing, Services Provided to Network Layer,	T1	4	Chalk & Talk,
		2.2	Flow Control, Error Control, Error Detection and Correction-CRC,	T1	4	Chalk & Talk
		2.3	Checksum-Idea, One's Complement, Hamming code.	T1	3	Chalk & Talk
		2.4	**IEEE Standards:** 802.3, 802.11.	T1, R1		Chalk & Talk

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		UNIT-3. Elementary Data Link Layer Protocols					
3	CO2: Compare and Contrast OSI and TCP/IP reference models. CO3: Interpret data link layer services and multiple access protocols	3.1	Simplex Protocol, Simplex Stop and Wait, Simplex Protocol for Noisy Channel.	T1, R2	5	Chalk & Talk,	
		3.2	**Sliding Window Protocol**: One Bit, Go Back N, Selective Repeat-Stop and Wait Protocol,	T1, R2	4	Chalk & Talk	
		3.3	Examples Of Data Link Protocols- HDLC, PPP.	T1, R2	4	Chalk & Talk	
		MID I EXAMINATION					
		4.1	**Medium Access Control Sub Layer:** Chanel Allocation Problem, ALOHA,	T1, R2	3	Chalk & Talk,	
		4.2	Carrier Sense Multiple Access (CSMA), CSMA With Collision Detection, CSMA with Collision Avoidance,	T1, R2	4	Chalk & Talk	
		UNIT 4. Network Layer					
4	CO 4: Analyze different routing protocols.	5.1	**Network Layer**: Network Layer Design Issues- Store and Forward Packet Switching,	T1, R1	2	Chalk & Talk,,	
		5.2	Service Provided to Transport Layer,	T1, T2	2	Chalk & Talk	
		5.3	Connection Oriented and Connection Less Service, Comparison of Virtual Circuit and Datagram Subnets.	T1, R1	3	Chalk & Talk	
		5.4	**Routing Algorithms:** Optimality Principle, Shortest Path Routing, Flooding,	T1, R1	3	Chalk & Talk	
		5.5	Hierarchical Routing, Broad Cast, Multi Cast,	T1, R1	2	Chalk & Talk	
		5.6	Distance Vector Routing, Link State Routing.	T1, R1	1	Chalk & Talk	
		5.7	**Network Layer in Internet**: IP Protocol, IP Address, IPv4 frame format.	T1, R1	2	Chalk & Talk	
5	CO 5: Illustrate the	**Unit-5. Transport Layer**					

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	essential principles of different transport layer protocols. CO 6: Summarize various application layer protocols.	6.1	**Transport Layer:** The Transport Services-Services Provided to the Upper Layer, Transport Service Primitives, Elements of Transport Protocol-Addressing, Connection Establishment, Connection Release.	T1, R1	3	Chalk & Talk
		6.2	**The Internet Transport Protocols:** TCP and UDP.	T1, R1	3	Chalk & Talk
		6.3	**Application Layer: DNS**(Domain Naming System)-DNS Namespace, Name Servers,	T1, R2	3	Chalk & Talk
		6.4	Electronic Mail-Architecture and Services, Message Format-MIME, Sending and Receiving E-mail, Message Transfer-SMTP.	T1, R2	2	Chalk & Talk
		6.5	**The World Wide Web-** Architecture Overview, URL, HTTP.	T1, R2	3	Chalk and Talk
				Total	76	
			MID II EXAMINATION			
			END EXAMINATIONS			

Text Books:

T1	Andrew S Tanenbaum, "Computer Networks, Pearson Education/PHI, 4th Edition.
T2	Andrew S Tanenbaum, "Computer Networks, Pearson Education/PHI, 4th Edition.

Reference Books:

R1	COMPUTER NETWORKS – S.Keshav, "An Engineering Approach to Computer Networks", Pearson Education 2nd Edition,
R2	COMPUTER NETWORKS – W.A. Shay, Thomson, "Understanding Communications and Networks", 3rd Edition

WEB SOURCE REFERENCES:

1	https://onlinecourses.nptel.ac.in/noc18_cs38
2	https://www.udacity.com/course/computer-networking--ud436
3	https://www.classcentral.com/subject/computer-networking
4	https://www.youtube.com/watch?v=3DZLItfbqtQ&list=PL32DBC269EF768F74

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DEPARTMENT OF CSE(AI)

LESSON PLAN A Y: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC3103	DESIGN AND ANALYSIS OF ALGORITHMS	IIII-I	CSE(AI)	5	A

COURSE OUTCOMES: Students are able to

CO 1: Apply asymptotic notations to measure the performance of algorithms [K3].
CO 2: Apply divide-and-conquer paradigm when an algorithmic design situation calls for it [K3].
CO 3: Identify all feasible solutions to get optimal solutions using greedy method [K3].
CO 4: Apply dynamic-programming approach, to solve real world problems [K3].
CO 5: Apply fundamental graph traversal techniques to solve various applications using Backtracking [K3].
CO 6: Analyze least cost and FIFO branch and bound paradigms [K4].

Unit No	Outcome	Topics/Activity		Ref Text book	Total Hours	Delivery Method
1	CO 1. Apply asymptotic notations to measure the performance of algorithms [K3].	**Unit-1. Introduction to Algorithms**				
		1.1	**Introduction:** Algorithm	T1	2	Chalk & Talk, PPT
		1.2	Algorithm Specification	T1	2	Chalk & Talk, PPT
		1.3	Performance Analysis	T1	1	Chalk & Talk, PPT
		1.4	Space complexity	T1	1	Chalk & Talk, PPT
		1.5	Time complexity	T1	2	Chalk & Talk, PPT
		1.6	Asymptotic Notations	T1	1	Chalk & Talk, PPT
		1.7	Big-oh notation	T1	1	Chalk & Talk, PPT
		1.8	Omega notation	T1	1	Chalk & Talk, PPT
		1.9	Theta notation	T1	1	Chalk & Talk, PPT
		I ASSIGNMENT EXAMINATION				
2	CO2. Apply divide-and-conquer paradigm when an algorithmic design situation calls for it [K3].	**Unit-2. Divide and Conquer**				
		2.1	Introduction to Divide and Conquer	T1	2	Chalk & Talk, PPT
		2.2	General method	T1	2	Chalk & Talk, PPT
		2.3	Binary search	T1	2	Chalk & Talk, PPT
		2.4	Merge sort	T1	2	Chalk & Talk, PPT
		2.5	Quick sort	T1	2	Chalk & Talk, PPT
		2.6	Strassen's matrix multiplication	T1	2	Chalk & Talk, PPT
3	CO 3. Identify all feasible solutions to get optimal solutions using greedy method [K3].	**Unit-3. Greedy Method**				
		3.1	Introduction to Greedy method	T1	1	Chalk & Talk, PPT
		3.2	General method	T1	1	Chalk & Talk, PPT
		3.3	Knapsack problem	T1	2	Chalk & Talk, PPT
		3.4	Job sequencing with deadlines	T1	2	Chalk & Talk, PPT
		I MID EXAMINATION				
		3.5	Minimum cost spanning trees	T1	3	Chalk & Talk, PPT, Tutorial
		3.6	Single source shortest paths	T1	2	Chalk & Talk, PPT

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		Unit-4. Dynamic Programming				
4	CO 4. Apply dynamic-programming approach, to solve real world problems [K3].	4.1	Introduction to Dynamic Programming	T1	1	Chalk & Talk, PPT
		4.2	The General method	T1	1	Chalk & Talk, PPT
		4.3	All pairs shortest path problem	T1	2	Chalk & Talk, PPT, Tutorial
		II ASSIGNMENT EXAMINATION				
		4.4	Optimal binary search trees	T1	2	Chalk & Talk, PPT
		4.5	0/1 knapsack, Reliability design	T1	2	Chalk & Talk, PPT
		4.6	The Travelling sales person problem	T1	1	Chalk & Talk, PPT
		4.7	Matrix-chain multiplication.	T1	2	Chalk & Talk, PPT
		Unit 5. Back Tracking, Branch and Bound				
5	CO 5. Summarize the functions of different remote monitoring protocols. [K2]. CO 6. Analyze least cost and FIFO branch and bound paradigms [K4].	5.1	Introduction to Backtracking	T1	1	Chalk & Talk, PPT
		5.2	The General method	T1	1	Chalk & Talk, PPT
		5.3	N-Queen problem	T1	2	Chalk & Talk, PPT
		5.4	Sum of subsets	T1	1	Chalk & Talk, PPT
		5.5	Graph coloring,	T1	1	Chalk & Talk, PPT, Tutorial
		5.6	Hamiltonian cycles.	T1	2	Chalk & Talk, PPT
		5.7	Branch and Bound:	T1	1	Chalk & Talk, PPT
		5.8	The method	T1	1	Chalk & Talk, PPT
		5.9	0/1 knapsack problem	T1	2	Chalk & Talk, PPT, Tutorial
		5.10	Travelling sales person problem	T1	2	Chalk & Talk, PPT
				Total	**60**	
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

T1 Fundamentals of Computer Algorithms, Second Edition – Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, Universities Press.

Reference Books:

R1 S. Sridhar, Oxford, Design and Analysis of Algorithms, First Edition –.

R2 T.H.Cormen, C.E.Leiserson, R.L.Rivest and C.Stein , Introduction to Algorithms, second edition, , PHI Pvt.Ltd Dreamtech.Distributed Network Management, Paul, John Wiley.

R3 Parag Himanshu Dave, Himanshu Bhalchandra Dave , Design and Analysis of Algorithms, Second Edition –, Pearson Education.

R4 Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman , Design and Analysis of Computer Algorithms –, Pearson Education.

R5 Anany Levitin , Introduction to the Design and Analysis of Algorithms, Third Edition –, Pearson Education.

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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601**

DEPARTMENT OF CSE (ARTIFICIAL INTELLIGENCE) A.Y.: 2024-25
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC3101	Operating Systems	III	IT	6	-

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO 1: Classify various operating system functionalities and generations. [K2]
CO 2: Interpret process management and exemplify the process synchronization techniques. [K2]
CO 3: Apply various process scheduling algorithms. [K3]
CO 4: Distinguish various memory management techniques and apply various deadlock techniques. [K4]
CO 5: Compare and contrast various disk scheduling algorithms and can interpret the file system implementations. [K2]

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
		UNIT-I				
I	**CO 1:** Classify various operating system functionalities and generations. [K2]	1.1	Computer System and Operating System Overview: Overview of Operating System - What operating systems do, User view, System view, defining operating systems;	T1	2	Chalk &Talk
		1.2	Operating Systems functions- Process Management, Memory Management, Storage Management, File-System Management, Mass-Storage Management, Caching, Protection and security;	T1	2	Chalk &Talk, PPTS
		1.3	Distributed systems, Special purpose systems, Real-Time Embedded Systems, Multimedia Systems, Handheld Systems, Operating Systems Structures, Simple Structure, Layered Approach, Micro Kernels, Modules;	T1	2	Chalk &Talk, Tutorials
		1.4	Systems Calls- Process control, File management, Device management, Information maintenance, Communication;	T1	2	Chalk &Talk, Tutorials

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		1.5	Operating systems generation.	T1	2	Chalk &Talk
	UNIT-II					
2	CO2: Interpret process management and exemplify the process synchronization techniques.	2.1	Process Management: Process, Process States, Process Control Block, Process Scheduling Scheduling Queues, Schedulers;	T1	2	Chalk &Talk,
		2.2	Operations- Process Creation, Process termination; Inter process communication- Shared-Memory Systems, Message-Passing Systems, Naming, Synchronization	T1	2	Chalk &Talk,
		2.3	Multi Thread programming models- Many to one, One to one, Many to Many model	T1, R1	2	Chalk &Talk ,Case Study
		2.4	Process Scheduling Criteria- CPU scheduler, Preemptive scheduling, Dispatcher, Scheduling Criteria	T1, R1	2	Chalk &Talk, NPTEL/MOOCS
		2.5	CPU Scheduling Algorithms- First Come First Serve, Shortest job first, Priority Scheduling, Round robin scheduling.	T1, R2	2	Chalk &Talk, NPTEL/MOOCS
	UNIT-III					
3.	**CO 3:** Apply various process scheduling algorithms. [K3]	3.1	Concurrency: Process Synchronization, The Critical-Section Problem, Peterson's Solution, Synchronization Hardware. Semaphores- Usage, Implementation, Deadlock and Starvation;	T', R3	2	Chalk &Talk ,tutorial
		3.2	Classic Problems of Synchronization- Bounded buffer problem,	T1, R3	3	Chalk &Talk,
		3.3	Readers writers' problem, Dining-Philosophers problem;	T1, R3	3	Chalk &Talk
		3.4	Monitors- Usage, Dining-Philosophers solution using monitors.	T1, R3	2	Chalk &Talk
			1ST MID EXMINATION			
		3.5	**Memory Management**: Swapping, Contiguous Memory Allocation-Memory Allocation, Fragmentation;	T1,, R1	3	Chalk &Talk
		3.6	Paging- Basic Method, Hardware Method, Protection, shared pages; Structure of the Page table-Hierarchical Paging, Hashed Page Tables. Segmentation- Basic Method, hardware	T1, R1	4	Chalk &Talk
	UNIT-IV					
		4.1	**Virtual Memory Management**: Virtual Memory. Demand Paging-Basic concept, copy on write;	T1,R1	2	Chalk &Talk
		4.2	Page-Replacement Algorithms-Basic page replacement,-FIFO page , optimal page, LRU page, LFU page replacement	T1,T2	3	Chalk &Talk, PPTS

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4	**CO 4:** Distinguish various memory management techniques and apply various deadlock techniques. [K4]	4.3	Thrashing- Cause of Thrashing, Working set model, Page fault frequency	T1,R1	2	Chalk &Talk
		4.4	**Principles of Deadlock**: Deadlock System Model. Deadlock Characterization- Necessary Conditions, Resource allocation graph	T1, R1	2	Chalk &Talk, Seminar
		4.5	Deadlock Prevention- Mutual exclusion, Hold and wait, No preemption, Circular wait;	T1, R1	2	Chalk &Talk
		4.6	Deadlock Detection and Avoidance- Resource allocation Graph algorithm, Banker's algorithm, Single instance of each resource type, several instances of each resource type;	T1, R1	2	Chalk &Talk, Seminar
		4.7	Recovery Form Deadlock- Process termination, Resource preemption	T1, R1	2	Chalk &Talk
			UNIT-V			
5.	**CO 5:** Compare and contrast various disk scheduling algorithms and can interpret the file system implementations. [K2]	5.1	File System: The Concept of a File- file attributes, file operations, file types, file structures; Access Methods- sequential access, direct access, other access methods	T1, R1	2	Chalk &Talk
		5.2	Directory Structure single level directory, two level directories, tree structured directory, general graph directory; File Sharing- multiple users, remote file systems;	T1, R1	2	Chalk &Talk
		5.3	Protection- types of access, access control. **Implementing File System**: File System Structure. File System Implementation- overview, partitions and mounting, virtual file systems;	T1, R1	2	Chalk &Talk
		5.4	Allocation Methods- contiguous allocation, linked allocation, indexed allocation; Free-Space Management- linked list, grouping, counting.	T1,, R1	2	Chalk &Talk
		5.5	Disk Scheduling- FCFS scheduling, SSTF scheduling, SCAN scheduling, C-SCAN scheduling, LOOK scheduling.	T1,, R1	2	Chalk &Talk, PPTS
				Total	**60**	
			2nd MID EXAMINATION			
			SEMESTER EXAMINATION			

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Text Books:

T1 : Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7/e, John Wiley, 2016.

Reference Books:

R1 Operating Systems – Internal and Design Principles Stallings, 6/e, Pearson Education, 2005

R2 Operating Systems – A Concept based Approach – D.M.Dhamdhere, 2/e, TMH, 2005.

R3 Operating System a Design Approach-Crowley, 1/e, TMH, 2005..

R4 Andrew S Tanenbaum , "Modern Operating Systems", PHI, 3/e, 2013.

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC32MC1	**EITK (R20)**	**III/I**	AI	**2**	**2**

COURSE OUTCOMES: Student is able to

CO1: Understand the philosophy of Indian Culture [K2]
CO2: Know the Indian languages, Epics Ramayana and Mahabharata [K2]
CO3: Acquire the information about Indian arts and architecture [K2]
CO4: Know the spread of cultural exchange in abroad [K2]
CO5: Know the contributions of scientists in different eras [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Understand the philosophy of Indian Culture [K2]		**Unit-1. Indian Culture: An Introduction**			
		1.1	Characteristics, Significance and Geography of Indian culture	**T1, R1**	2	Chalk & Talk
		1.2	Society in India through ages- Ancient period	**T1, R1**	1	Chalk & Talk
		1.3	Varna and jati, family and marriage in India	**T1, R1**	1	Chalk & Talk
		1.4	Position of women in ancient India	**T1, R1**	1	Chalk & Talk
		1.5	Contemporary period; caste system and communalism	**T1, R1**	1	Chalk & Talk
2	CO2: Know the Indian languages, Epics Ramayana and Mahabharata [K2]		**Unit-2. Indian Languages and Literature**			
		2.1	Evolution of script and languages in India: Harappan Script and Brahmi Script	**T1, R1**	2	Chalk & Talk
		2.2	Short History of the Sanskrit literature: The Vedas, The Brahmanas	**T1, R1**	1	Chalk & Talk
		2.3	Short History of the Sanskrit literature: Upanishads & Sutras	**T1, R1**	1	Chalk & Talk
		2.4	Epics: Ramayana	**T1, R1**	1	Chalk & Talk
		2.5	Epics: Mahabharata	**T1, R1**	1	Chalk & Talk
3	CO3: Acquire the information about Indian arts and architecture [K2]		**Unit-3. Indian Arts and Architecture**			
		3.1	Indian Art & Architecture: Hindu Temple Architecture	**T1, R1**	02	Chalk & Talk
		3.2	Indian Art & Architecture: Buddhist Architecture	**T1, R1**	1	Chalk & Talk

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		3.3	Indian Art & Architecture: Medieval Architecture	T1, R1	1	Chalk & Talk
		MID I EXAMINATION				
		3.4	Rise of modern theatre	T1, R1	1	Chalk & Talk
		3.5	Rise of Indian cinema	T1, R1	1	Chalk & Talk
4	CO4: Know the spread of cultural exchange in abroad [K2]	**Unit-4. Spread of Indian Culture Abroad**				
		4.1	Causes, Significance and Modes of Cultural Exchange	T2, R2	02	Chalk & Talk
		4.2	Through Traders, Teachers, Emissaries, Missionaries and Gypsies	T2, R2	02	Chalk & Talk
		4.3	India, Central Asia through ages	T2, R2	1	Chalk & Talk
		4.4	India, Western World through ages	T2, R2	1	Chalk & Talk
5	CO5: Know the contributions of scientists in different eras [K2]	**Unit 5. Education System in India**				
		5.1	Education in ancient, medieval and modern India	T2, R2	2	Chalk & Talk
		5.2	Aims of education, Science of ancient India	T2, R2	1	Chalk & Talk
		5.3	Aims of education, Science of Modern India	T2, R2	1	Chalk & Talk
		5.4	Scientists of ancient India,	T2, R2	1	Chalk & Talk
		5.5	Scientists of Modern India	T2, R2	1	Chalk & Talk
				Total	30	
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

T1 Kapil Kapoor, "Text and Interpretation: The indian tradition" ISBN: 81246033375, 2005

T2 " Science in Samskrit", Samskrita Bharti Publisher , ISBN 13 : 978- 8187276333,2007

Reference Books:

R1 NCERT , "Position Paper On Arts ,Music, Dance Theatre", ISBN 81-7450 494-X,200

R2 The indian tradition by PM Bakshi, Universal law publishing co

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Narasaraopeta Engineering College
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DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2101	DISCRETE MATHEMATICS & GRAPH THEORY	II-I	CSE(AI)	5	A&B

COURSE OUTCOMES:

CO1: Build skills in solving mathematical problems. (K3)
CO2: Comprehend mathematical principles and logic. (K4)
CO3: Demonstrate knowledge of mathematical modelling and proficiency in using mathematical software. (K6)
CO4: Manipulate and analyze data numerically and/or graphically appropriate Software. (K3)
CO5: How to communicate effectively mathematical ideas/results verbally or in writing. (K1)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT – I: MATHEMATICAL LOGIC			
1	**CO1**: Build skills in solving mathematical problems. (K3)	1.1	Statements and Notations, Connectives - Negation	T1, T2, R1	1	Chalk & Talk, PPT
		1.2	Conjunction, Disjunction, Statement Formulas and Truth tables	T1, T2, R1	1	Chalk & Talk
		1.3	Conditional and Bi Conditional Statements, Well-formed Formulas, Tautologies, Equivalence of Formulas	T1, T2, R1	1	Chalk & Talk
		1.4	Duality Law, Tautological Implications, Functionally Complete Sets of Connectives, Other Connectives	T1, T2, R1	1	Chalk & Talk, PPT
		1.5	Disjunctive Normal Forms, Conjunctive Normal Forms	T1, T2, R1	1	Chalk & Talk
		1.6	Principal Disjunctive Normal Forms, Principal Conjunctive Normal Forms	T1, T2, R1	1	Chalk & Talk
		1.7	Introduction, Validity Using Truth Tables,-I, Validity Using Truth Tables-II	T1, T2,T3, R1	1	Chalk & Talk, PPT
		1.8	Consistency of Premises, Indirect method of proof	T1, T2, R1	1	Chalk & Talk PPT
		1.9	**Predicate calculus:** Predicates, Statement Function	T1, T2, R1	1	Chalk & Talk
		1.10	Variables and Quantifiers	T1, T2, R1	1	Chalk & Talk
		1.11	Free and bound variables	T1, T2, R1, R2	1	Tutorials
		1.12	Inference Theory of Predicate Calculus-I	T1, T2, R1, R2	1	Tutorials
			ASSIGNMENT-I EXAMINATION			
			UNIT – II: SET THEORY			
	CO2: Comprehend mathematical	2.1	Operations on Sets, Principle of Inclusion-Exclusion	T1, T2,R1	1	Chalk & Talk, PPT

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2	principles and logic. (K4)	2.2	Relations: Properties	T1, T2, R1	1	Chalk & T
		2.3	Operations, Partition and Covering	T1, T2, R1	1	Chalk & Talk
		2.4	Transitive Closure	T1, T2, R1	1	Chalk & Talk
		2.5	Equivalence	T1, T2, R1	1	Chalk & Talk
		2.6	Compatibility	T1, T2,R1	1	PPT
		2.7	Partial Ordering	T1, T2, R1, R2	1	Chalk & Talk
		2.8	Hasse Diagrams	T1, T2, R1. R3	1	Chalk & Talk, PPT
		2.9	Functions: Bijective, Composition	T1, T2, R1, R2	1	Chalk & Talk
		2.10	Inverse, Permutation	T1, T2, R1	1	Chalk & Talk Students Seminars
		2.11	Recursive Functions	T1, T2,T3, R1	1	Chalk & Talk, Tutorials
		2.12	Lattice and its Properties	T1, T2, R1	1	Chalk & Talk
			MID-I EXAMINATION			
3	**CO3:** Demonstrate knowledge of mathematical modeling and proficiency in using mathematical software. (K6)		**UNIT – III: CAMBINATORICS AND RECURRENCE RELATIONS**			
		3.1	Basis of Counting, Permutations	T1, T2, T3, R1	1	Chalk & Talk, PPT.
		3.2	Permutations with Repetitions	T1, T2, T3, R1	1	Chalk & Talk
		3.3	Circular and Restricted Permutations	T1, T2, T3, R1	1	PPT.
		3.4	Combinations, Restricted Combinations	T1, T2, T3, R1	1	Chalk & Talk
		3.5	Binomial and Multinomial Coefficients and Theorems	T1, T2, R1	1	Chalk & Talk
		3.6	**Recurrence Relations:** Generating Functions	T1, T2, T3, R1	1	Chalk & Talk
		3.7	Function of Sequences, Partial Fractions	T1, T2, R1	1	Chalk & Talk
		3.8	Calculating Coefficient of Generating Functions	T1, T2, R1	1	Chalk & Talk PPT
		3.9	Recurrence Relations, and Formulation as Recurrence Relations	T1, T2, T3, R1	1	Chalk & Talk Tutorials
		3.10	Solving Recurrence Relations by Substitution and Generating Functions	T1, T2, R1, R3	1	Chalk & Talk
		3.11	Method of Characteristic Roots	T1, T2, T3, R1	1	Chalk & Talk PPT
		3.12	Solving Inhomogeneous Recurrence Relations	T1, T2, T3, R1, R2	1	Chalk & Talk Tutorials
4	**CO4:** Manipulate and analyze data numerically and/or graphically appropriate Software. (K3)		**UNIT–IV: GRAPH THEORY**			
		4.1	Basic Concepts	T1, T2, R1	1	Chalk & Talk, PPT.
		4.2	Graph Theory and its Applications	T1, T2, R1	1	Chalk & Talk
		4.3	Subgraphs	T1, T2, R1	1	Chalk & Talk Students Seminars
		4.4	Graph Representations	T1, T2, R1	1	Chalk & Talk, Tutorials
		4.5	Adjacency and Incidence Matrices	T1, T2, R1	1	Chalk & Talk, Tutorials
		4.6	Isomorphic Graphs	T1, T2, R1, R3	1	Chalk & Talk
		4.7	Isomorphic Graphs	T1, T2, R1, R2	1	Chalk & Talk

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		4.8	Paths and Circuits	T1, T2, R1, R3	1	Chalk & Talk PPT
		4.9	Paths and Circuits			
		4.10	Eulerian and Hamiltonian Graphs	T1, T2, R1, R2	1	Chalk & Talk
		4.11	Eulerian and Hamiltonian Graphs	T1, T2, R1, R2	1	Chalk & Talk
		4.12	Eulerian and Hamiltonian Graphs	T1, T2,R1, R2	1	Chalk & Talk PPT
			ASSIGNMENT-II EXAMINATION			
			UNIT – V: MULTI GRAPHS			
5	**CO5:** to communicate effectively mathematical ideas/results verbally or in writing. (K1)	5.1	Multigraphs	T1, T2, R1	1	Chalk & Talk PPT
		5.2	Bipartite and Planar Graphs	T1, T2, R1	1	Chalk & Talk, Tutorials
		5.3	Bipartite and Planar Graphs	T1, T2, R1	1	Chalk & Talk
		5.4	Euler's Theorem	T1, T2, R1	1	Chalk & Talk
		5.5	Euler's Theorem	T1, T2, R1	1	Chalk & Talk
		5.6	Graph Colouring and Covering	T1, T2,R1, R3	1	Chalk & Talk PPT
		5.7	Chromatic Number	T1, T2,R1, R3	1	Chalk & Talk
		5.8	Spanning Trees	T1, T2,R1, R3	1	Chalk & Talk
		5.9	Prim's and Kruskal's Algorithms	T1, T2,R1, R2	1	Chalk & Talk
		5.10	Prim's and Kruskal's Algorithms	T1, T2,R1, R2	1	Chalk & Talk PPT
		5.11	BFS and DFS Spanning Trees.	T1, T2,R1, R3	1	Chalk & Talk
		5.12	BFS and DFS Spanning Trees.	T1, T2,R1, R3	1	Chalk & Talk
			MID-II EXAMINATION			
						TOTAL:60

Text Books:

1. Discrete Mathematical Structures with Applications to Computer Science, J. P. Tremblay and P. Manohar, Tata McGraw Hill.
2. Elements of Discrete Mathematics-A Computer Oriented Approach, C. L.Liu and D. P. Mohapatra, 3rd Edition, Tata McGraw Hill.
3. Theory and Problems of Discrete Mathematics, Schaum's Outline Series, Seymour Lipschutz and Marc Lars Lipson, 3rd Edition, McGraw Hill.

Refrences:

1. Discrete Mathematics for Computer Scientists and Mathematicians, J. L.Mott, A. Kandel and T. P. Baker, 2nd Edition, Prentice Hall of India publishers.
2. Discrete Mathematics, S. K. Chakraborthy and B. K. Sarkar, Oxford press, 2011.
3. Discrete Mathematics and its Applications with Combinatorics and GraphTheory, K.H. Rosen, 7th Edition, Tata McGraw Hill.

WEB SOURCE REFERENCES:

1	https://nptel.ac.in/downloads/106106094/
2	https://nptel.ac.in/courses/106108054 (Graph theory)
3	https://onlinecourses.nptel.ac.in/noc18_ma16/unit?unit=18&lesson=19
4	https://onlinecourses.nptel.ac.in/noc18_ma16/student/home
5	https://onlinecourses.nptel.ac.in/noc18_cs53/student/home

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LESSON PLAN (COMMON TO ALL BRANCHES)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC21MC	**ENVIRONMENTAL STUDIES (R23)**	**II-I**	CSE(AI)	**2**	....

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO:1 Understand multi-disciplinary nature of environmental studies and Analyze the natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources.(K2)	**Unit-1. Multidisciplinary nature of Environmental Studies**				
		1.1	Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.	T1, T2, R1	1	Chalk& Talk
		1.2	Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems	T1, T2, R1	1	Chalk& Talk
		1.3	Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction	T1, T2, R1	2	Active learning & PPT
		1.4	Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems	T1	2	PPT
		1.5	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.	T1, T2, R1	1	Active learning & PPT
2	CO2: Explain the concepts of the ecosystem and its function in the	**Unit-2.** Ecosystems				
		2.1	Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers	T1, T2, R3	2	Active learning & PPT

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	environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web. Explain the biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity. (K2)		and decomposers – Energy flow in the ecosystem – Ecological succession mining, dams and effects on forest and tribal people.			
		2.2	Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:	T1, T2, R3	2	PPT & Case Study
		2.3	a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem	T1, T2, R3	1	Chalk& Talk
		2.4	d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) Biodiversity and Its Conservation : Introduction and Definition: genetic, species and ecosystem diversity.	T1, T2, R3	1	Chalk& Talk
		2.5	Bio-geographical classification of India Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values	T1	1	Chalk& Talk
		2.6	Biodiversity at global, National and local levels – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts	T1, T2, R1	1	Chalk& Talk
3	CO3: Distinguish various attributes of the pollution, their impacts and	**Unit-3.** Environmental Pollution:				
		3.1	Environmental Pollution: Definition, Cause, effects and control measures of: a. Air Pollution.	T1, T2, R1	1	Chalk& Talk
		3.2	Definition, Cause, effects and control measures of: b.Water pollution c.Soil pollution	T1, T2, R1	1	Chalk& Talk

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	measures to reduce or control the pollution along with waste management(K2)	3.3	d.Marine pollution e.Noise pollution	T1, T2, R1	1	Active learning & PPT
		3.4	Solid Waste Management: Causes, effects and control measures of urban and industrial wastes	T1, T2, R1	1	PPT
		3.5	Role of an individual in prevention of pollution – Pollution case studies	T1, T2, R1	1	Tutorial
		3.6	Disaster management: floods, earthquake, cyclone and landslides.	T1, T2, R1	1	Tutorial & PPT
4	CO4: Understand the rainwater harvesting, watershed management, and ozone layer depletion and waste land reclamation. (K2))	**Unit-4.** Social Issues and the Environment:				
		4.1	Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershedmanagement	T1, T2, R3	2	Chalk& Talk, Industrial Visit
		4.2	Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies	T1, T2, R3	2	PPT
		4.3	Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act	T1, T2, R3	2	Chalk& Talk, Case Study
		4.4	Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.	T1, T2, R3	1	Tutorial, PPT
5	CO 5: Illustrate the causes of population explosion, value	**Unit 5.** Human Population And The Environment:				
		5.1	Population growth, variation among nations. Population explosion	T1, T2, R3	1	PPT, Chalk& Talk

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	education and welfare programmes. (K3).	5.2	Family Welfare Programmes. – Environment and human health	T1, T2, R3 T1	1	PPT Active learning & PPT
		5.3	Human Rights – Value Education – HIV/AIDS	T1, T2, R3	1	Case Study & PPT
		5.4	Women and Child Welfare	T1, T2, R1	1	Chalk& Talk
		5.5	Role of information Technology in Environment and human health – Case studies.	T1, T2, R1	1	Chalk& Talk
		5.6	Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.	T1, T2, R1	1	Chalk& Talk, Active Learning
				Total	**34**	

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Erach Bharucha,Textbook of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
T2	Palaniswamy, Environmental Studies, 2/e, Pearson education, 2014.
T3	S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.
T4	K.Raghavan Nambiar, "Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e,Cengage Publications, 2012.
R2	M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BSPublication, 2014.

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R3	J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering,Prentice Hall of India Private limited, 1988.
R4	G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House,2018.
R5	Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineeringand Science, 1/e, Prentice Hall of India Private limited, 1991

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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601**

DEPARTMENT OF IT& CSE (AI)
LESSON PLAN

Subject Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2105	Object Oriented Programming Through Java(R23)	3	CSE(AI)	6	A&B

After completion of this course the student should be able to

CO	Course Outcome Statement
CO1	Interpret the syntax and semantics of java programs language and OOPs concepts. [K2]
CO2	Make use of different predefined classes and packages and interfaces to develop programs using OOPs concepts. [K3]
CO3	Apply exception handling and FILE I/O operations on java programs. [K3]
CO4	Make use of Multithreading and String handling Functions on java. [K3]
CO5	Make use of Java FX in the design of GUI Applications, Event-Handling to develop GUI and JDBC connections. [K3]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
		Unit-1. Object Oriented Programming				
		1.1	Introduction to Java	T1	1	Chalk & Talk
		1.2	Writing Simple Java Programs, Elements or Tokens in Java Programs	T1	1	Chalk & Talk
		1.3	Java Statements	T1, T2, R1	2	Chalk & Talk
		1.4	Command Line Arguments, User Input to Programs	T1, T2, R2	2	Chalk & Talk
	CO 1: Interpret the syntax and semantics of java programs language and OOPs concepts. [K2]	1.5	Escape Sequences Comments, Programming Style	T1, T2, R1	1	Chalk & Talk
		1.6	Data Types, Variables, and Operators :Introduction, Data Types in Java	T1, T2, R1	1	Chalk & Talk
		1.7	Declaration of Variables, Data Types, Type Casting, Scope of Variable Identifier, Literal Constants	T1, T2, R1	2	Chalk & Talk
		1.8	Symbolic Constants, Formatted Output with printf() Method, Static Variables and Methods, Attribute Final	T1, T2, R1	1	Chalk & Talk
		1.9	Introduction to Operators, Precedence and Associativity of Operators, Assignment Operator (=), Basic Arithmetic Operators, Increment (++) and Decrement (- -) Operators,	T1, T2, R1	1	Chalk & Talk

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		1.10	Ternary Operator, Relational Operators, Boolean Logical Operators, Bitwise Logical Operators	T1, T2, R1	1	Chalk & Talk, PPT
		1.11	Control Statements: Introduction, if Expression, Nested if Expressions, if–else Expressions, Ternary Operator?:, Switch Statement, Iteration Statements, while Expression	T1, T2, R1	1	Chalk & Talk, PPT
		1.12	do–while Loop, for Loop, Nested for Loop, For–Each for Loop, Break Statement, Continue Statement	T1, T2, R1	1	Chalk & Talk, PPT
ASSIGNMENT I- EXAMINATION						
2	**CO2**: Make use of different predefined classes and packages and interfaces to develop programs using OOPs concepts. [K3]	**Unit-2. Classes and Objects**				
		2.1	Introduction, Class Declaration and Modifiers, Class Members, Declaration of Class Objects	T1, T2, R1	1	Chalk & Talk, PPT
		2.2	Assigning One Object to Another Access Control for Class Members	T1, T2, R1	1	Chalk & Talk, PPT
		2.3	Accessing Private Members of Class,	T1, T2, R1	T1	Chalk & Talk, PPT
		2.4	Constructor Methods for Class, Overloaded Constructor Methods	T1, T2, R1	1	Chalk & Talk, PPT
		2.5	Nested Classes, Final Class and Methods	T1, T2, R1	1	Chalk & Talk, PPT
		2.6	Passing Arguments by Value and by Reference, Keyword this	T1, T2, R1	1	Chalk & Talk, PPT
		2.7	Introduction, Defining Methods, Overloaded Methods	T1, T2, R1	1	Chalk & Talk, PPT
		2.8	Overloaded Constructor Methods	T1, T2, R1	1	Chalk & Talk, PPT
		2.9	Class Objects as Parameters in Methods, Access Control	T1, T2, R1	1	Chalk & Talk, PPT
		2.10	Recursive Methods, Nesting of Methods	T1, T2, R1	1	Chalk & Talk, PPT
		2.11	Overriding Methods, Attributes Final and Static	T1, T2, R1	1	Chalk & Talk, PPT
MID -1 EXAMINATIONS						
3	**CO3:**Apply exception handling and FILE I/O operations on java programs. [K3]	**Unit-3. Arrays**				
		3.1	Introduction, Declaration and Initialization of Arrays	T1, T2, R1	1	Chalk & Talk
		3.2	Storage of Array in Computer Memory, Accessing Elements of Arrays	T1, T2, R1	1	Chalk & Talk, PPT

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		3.3	Operations on Array Elements, Assigning Array to Another Array	T1, T2, R1	2	Chalk & Talk , PPT
		3.4	Dynamic Change of Array Size, Sorting of Arrays, Search for Values in Arrays	T1, T2, R1	2	Chalk & Talk
		3.5	Class Arrays, Two-dimensional Arrays, Arrays of Varying Lengths	T1, T2, R1	2	Chalk & Talk
		3.6	Three dimensional Arrays, Arrays as Vectors	T1, T2, R1	1	Students seminar
		3.7	**Inheritance**: Introduction, Process of Inheritance, Types of Inheritances	T1, T2, R1	1	Chalk & Talk
		3.8	Universal Super Class ,Object Class, Inhibiting Inheritance of Class Using Final, Access Control,	T1, T2, R1	1	Chalk & Talk
		3.9	Multilevel Inheritance, Application of Keyword Super, Constructor Method	T1, T2, R1	1	Chalk & Talk
		3.10	Inheritance, Method Overriding Dynamic Method Dispatch, Abstract Classes, Interfaces and Inheritance	T1, T2, R1	1	Chalk & Talk
		3.11	**Interfaces**: Introduction, Declaration of Interface, Implementation of Interface, Multiple Interfaces, Nested Interfaces, Inheritance of Interfaces	T1, T2, R1	1	Chalk & Talk
		3.12	Default Methods in Interfaces, Static Methods in Interface, Functional Interfaces, Annotations.	T1, T2, R1	1	Chalk & Talk
ASSIGNMENT II- EXAMINATION						
4	**CO4**: Make use of Multithreading and String handling Functions on java. [K3]	**Unit 4 : Pointers & User Defined Data types**				
		4.1	**Packages and Java Library**: Introduction, Defining Package, Importing Packages and Classes into Programs, Path and Class Path, Access Control, P	T1, T2,R1	1	Chalk & Talk
		4.2	Packages in Java SE, Java.lang Package and its Classes, Class Object, Enumeration, class Math, Wrapper Classes, Auto-boxing and Auto-unboxing, Java util Classes and Interfaces, Formatter Class, Random Class	T1, T2,R1	1	PPT
		4.3	Time Package, Class Instant (java.time.Instant), Formatting for Date/Time in Java, Temporal Adjusters Class, Temporal Adjusters Class.	T1, T2,R1	1	Student seminar
		4.4	**Exception Handling:** Introduction, Hierarchy of Standard Exception Classes, Keywords throws and throw, try, catch, and finally Blocks,	T1, T2,R1	1	Chalk & Talk, PPT
		4.5	Multiple Catch Clauses, Class	T1, T2,R1	1	Chalk &

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			throwable.			Talk, PPT
		4.6	Unchecked Exceptios, Checked Exceptions	T1, T2,R1	1	Chalk & Talk
		4.7	**Java I/O and File:** Java I/O API, standard I/O streams, types,	T1, T2,R1	2	Chalk & Talk
		4.8	Byte streams, Character streams,	T1, T2,R1	1	Chalk & Talk
		4.9	Scanner class , Examples	T1, T2,R1	1	Chalk & Talk
		4.10	Files in Java	T1, T2,R1	1	Chalk & Talk
5	**CO5:** Make use of Java FX in the design of GUI Applications, Event-Handling to develop GUI and JDBC connections. [K3]	**Unit 5. Functions & File Handling**				
		5.1	**String Handling in Java:**, Introduction, Interface Char Sequence Characters.	T1, T2, R1	1	Chalk & Talk
		5.2	Class String, Methods for Extracting from Strings	T1, T2,R1	1	PPT
		5.3	Comparison, Modifying, Searching; Class String Buffer	T1, T2,R1	1	Student Seminars
		5.4	Multithreaded Programming: Introduction, Need for Multiple Threads Multithreaded Programming for Multi-core Processor,	T1, T2,R1	2	Chalk & Talk
		5.5	Thread Class, Main Thread-Creation of New Threads, Thread States, Thread Priority-Synchronization, Deadlock and Race Situations	T1, T2,R1	1	Chalk & Talk
		5.6	Inter-thread Communication - Suspending, Resuming, and Stopping of Threads	T1, T2,R1	1	Chalk & Talk, PPT
		5.7	**Java Database Connectivity:** Introduction,JDBC Architecture, Installing MySQL and MySQL Connector/J,	T1, T2,R1	2	Chalk & Talk
		5.8	JDBC Environment Setup, Establishing JDBC Database	T1, T2,R1	1	Chalk & Talk
		5.9	Connections, Result Set Interface	T1, T2,R1	1	Chalk & Talk
		5.10	**Java FX GUI:** Java FX Scene Builder, Java FX App Window Structure, ,	T1, T2,R1	1	Chalk & Talk
		5.11	displaying text and image, event handling	T1, T2,R1	1	
		5.12	laying out nodes in scene graph, mouse events	T1, T2,R1	1	
					TOTAL: 67	
			MID II EXAMINATION			
			END EXAMINATIONS			

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TEXT BOOKS:

1. JAVA one step ahead, Anitha Seth, B.L.Juneja, Oxford
2. Joy with JAVA, Fundamentals of Object Oriented Programming, DebasisSamanta, MonalisaSarma, Cambridge, 2023
3. . JAVA 9 for Programmers, Paul Deitel, Harvey Deitel, 4th Edition, Pearson

REFERENCES BOOKS:

1. The complete Reference Java, 11thedition, Herbert Schildt,TMH
2. Introduction to Java programming, 7th Edition, Y Daniel Liang, Pearson

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DEPARTMENT OF INFORMATION TECHNOLOGY&CSE(AI)
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R23CC2104	Advanced Data Structures & Algorithm Analysis (R23)	I	CSE(AI)	5	A&B

COURSE OUTCOMES:

After successful completion of this course, students will be able to:
CO 1: Apply asymptotic notations to measure the performance of algorithms [K3]
CO 2: Appling divide and conquer parading when an algorithmic design situation calls for it. [K3]
CO 3: Construct greedy algorithms and dynamic programming techniques to solve problems [K3]
CO 4: Utilize backtracking and branch and bound algorithms to solve combinatorial problems construct [K3]
CO 5: Classifying computational problems into NP, NP-Hard, and NP-Complete. [K4]

Unit No	Outcome		Topics/Activity	Ref./ Text Book	Hours	Delivery Method
1	CO 1: Apply asymptotic notations to measure the performance of algorithms [K3]		**Unit-1: Introduction**			
		1.1	Introduction to Algorithm Analysis	T1	1	Chalk & Talm
		1.2	Space and Time Complexity analysis	T1	1	Chalk & Talm
		1.3	Asymptotic Notations	T1	2	PPT
			AVL Trees			
		1.4	Creation	T1	1	Chalk & Talm
		1.5	Insertion	T1	2	Chalk & Talm
		1.6	Deletion operations and Applications	T1	2	Chalk & Talm
			Heap-Trees (Priority Queues)			Chalk & Talm
		1.7	Min and Max Heaps	T1	2	
		1.8	Operations and Applications	T1	2	Chalk & Talm
FIRST ASSIGNMENT						
	CO 2: Appling divide and conquer parading when an algorithmic design situation calls for it. [K3]		**Unit-2: Graphs**			
		2.1	Terminology, Representations	T1	1	PPT
		2.2	Basic Search and Traversals	T1	2	Chalk & Talm
			Graphs			

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		2.3	Connected Components and Biconnected Components, Applications	T1	2	Chalk & Talm
		2.4	Divide and conquer	T1	2	Chalk & Talm
		2.5	The General Method	T1	1	Chalk & Talm
		2.6	Quick Sort	T1	2	Chalk & Talm
		2.7	Merge Sort	T1	2	Chalk & Talm
		2.8	Strassen's matrix multiplication	T1	2	Chalk & Talm
			Unit-3: Greedy Method			
3	CO 3: Construct greedy algorithms and dynamic programming techniques to solve problems [K3]	3.1	General Method	T1	1	PPT
		3.2	Job Sequencing with deadlines	T1	1	Chalk & Talm
		3.3	Knapsack Problem	T1	2	Chalk & Talm
		3.4	Minimum cost spanning trees	T1	2	Chalk & Talm
		3.5	Single Source Shortest Paths	T1	2	Chalk & Talm
			MID I EXAMINATION			
			Dynamic Programming			
		3.6	General Method	T1	1	Chalk & Talm
		3.7	All pairs shortest paths	T1	2	Chalk & Talm
		3.8	0/1 Knapsack	T1	2	Chalk & Talm
		3.9	String Editing	T1	2	Chalk & Talm
		3.10	Travelling Salesperson problem	T1	2	Chalk & Talm
		3.11	Optimal Binary Search Trees	T1	2	Chalk & Talm
			Unit-4: Backtracking			
	CO 4: Utilize backtracking and branch and bound algorithms to solve combinatorial problems construct [K3]	4.1	General Method	T1	1	Chalk & Talm
		4.2	8-Queens Problem	T1	2	Chalk & Talm
		4.3	Sum of Subsets problem	T1	2	Chalk & Talm

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4		4.4	Graph Coloring	T1	2	Chalk & Talm
		4.5	0/1 Knapsack Problem	T1	2	Chalk & Talm
		Branch and Bound				
		4.6	The General Method	T1	1	Chalk & Talm
		4.7	0/1 Knapsack Problem	T1	2	Chalk & Talm
		4.8	Travelling Salesperson problem	T1	2	Chalk & Talm
SECOND ASSIGNMENT						
5	CO 5: Classifying computational problems into NP, NP-Hard, and NP-Complete. [K4]	**Unit-5: NP Hard and NP Complete Problems**				
		5.1	Basic Concepts	T1	1	PPT
		NP Hard Graph Problems				
		5.2	Clique Decision Problem (CDP)	T1	1	Chalk & Talm
		5.3	Traveling Salesperson Decision Problem (TSP)	T1	2	Chalk & Talm
		NP Hard Scheduling Problems				
		5.4	Job Shop Scheduling	T1	2	Chalk & Talm
Total Number of Hours:66						
MID II EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS	
1	Fundamentals of Data Structures in C++, Ellis Horowitz, Sartaj Sahni, Mehta Dinesh 2nd Edition Universities Press.
2	Computer Algorithms/C++ Ellis Horowitz, Sartaj Sahni, Sanguthevar Rajasekaran 2nd Edition University Press
REFERENCE BOOKS	
1	Data Structures and program design in C, Robert Kruse, Pearson Education Asia
2	An introduction to Data Structures with applications, Trembley & Sorenson, McGraw Hill
3	The Art of Computer Programming, Vol.1: Fundamental Algorithms, Donald E Knuth, Addison-Wesley, 1997.
4	Data Structures using C & C++: Langsam, Augenstein & Tanenbaum, Pearson, 1995
5	Algorithms + Data Structures & Programs:, N.Wirth, PHI

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6	Fundamentals of Data Structures in C++: Horowitz Sahni & Mehta, Galgottia Pub.
7	Data structures in Java:, Thomas Standish, Pearson Education Asia
ONLINE LEARNING RESOURCES	
1	https://www.tutorialspoint.com/advanced_data_structures/index.asp
2	http://peterindia.net/Algorithms.html
3	Abdul Bari, 1. Introduction to Algorithms (youtube.com)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING(AI)
LESSON PLAN

Subject Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2106	ARTIFICIAL INTELLIGENCE	3	CSE (AI)	5	A&B

After completion of this course the student should be able to

CO	Course Outcome Statement
CO1	The student should be made to study the concepts of Artificial Intelligence.[K2]
CO2	The student should be made to learn the methods of solving problems using Artificial Intelligence.[K3]
CO3	The student should be made to introduce the concepts of Expert Systems.[K3]
CO4	To understand the applications of AI, namely game playing, theorem proving, and Machine learning.[K3]
CO5	To learn different knowledge representation techniques[K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1.	**CO 1:** The student should be made to study the concepts of Artificial Intelligence.[K2]	**Unit-1. Introduction**				
		1.1	Introduction: AI problems,	T1, T2	2	Chalk & Talk
		1.2	foundation of AI and history of AI intelligent agents:	T1, T2	2	Chalk & Talk
		1.3	Agents and Environments	T1, T2	2	Chalk & Talk
		1.4	the concept of rationality	T1, T2	1	Chalk & Talk, PPT
		1.5	the nature of environments,	T1, T2	2	Chalk & Talk
		1.6	structure of agents, Problem solving agents,	T1, T2	2	Chalk & Talk
		1.12	Problem formulation.	T1, T2	1	Chalk & Talk
	ASSIGNMENT I- EXAMINATION					
2.	**CO2:** The student should be made to learn the methods of solving problems using Artificial Intelligence.[K3]	**Unit-2. Searching**				
		2.1	Searching for solutions, uniformed search strategies	T1, T2,	2	Chalk & Talk
		2.2	Breadth first search, Depth First Search.	T1, T2	2	Chalk & Talk
		2.3	Search with partial information (Heuristic search) Hill climbing, A* ,AO* Algorithms,	T1, T2	2	Chalk & Talk, PPT
		2.4	Problem reduction, Game Playing-Adverbial search,	T1, T2	2	Chalk & Talk
		2.5	Games, mini-max algorithm, optimal decisions in multiplayer games	T1, T2	3	Chalk & Talk

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		2.6	Problem in Game playing, Alpha-Beta Pruning,	T1, T2	2	Chalk & Talk
		2.7	Evaluation functions	T1, T2	2	Students Seminar
MID -1 EXAMINATIONS						
3.	**CO3**: The student should be made to introduce the concepts of Expert Systems. [K3]	**Unit-3. Representation of Knowledge**				
		3.1	Knowledge representation issues,	T1, T2	1	Chalk & Talk
		3.2	predicate logic- logic programming,	T1, T2	2	
		3.3	semantic nets- frames and inheritance,	T1, T2	2	Chalk & Talk
		3.4	constraint propagation, representing knowledge using rules,	T1, T2	2	Chalk & Talk
		3.5	Rules based deduction systems. Reasoning under uncertainty,	T1, T2	2	Chalk & Talk
		3.6	Review of probability,	T1, T2	1	Chalk & Talk
		3.7	Bayes'probabilistic interferences and dempstershafer theory.	T1, T2	2	Chalk & Talk
ASSIGNMENT II- EXAMINATION						
4.	**CO4**: To understand the applications of AI, namely game playing, theorem proving, and Machine learning.[K3]	**Unit 4 : Logic concepts**				
		4.1	First order logic. Inference in first order logic,	T1, T2	2	Chalk & Talk
		4.2	propositional vs. first order inference,	T1, T2	2	Chalk & Talk
		4.3	unification & lifts forward chaining, Backward chaining,	T1, T2	2	Student seminar
		4.4	Resolution, Learning from observation	T1, T2	2	Chalk & Talk
		4.5	Inductive learning, Decision trees,	T1, T2	1	Chalk & Talk
		4.6	Explanation based learning,	T1, T2	1	Chalk & Talk
		4.7	Statistical Learning methods Reinforcement Learning.	T1, T2	2	Chalk & Talk
5.	**CO5:** To learn different knowledge representation techniques[K4]	**Unit 5. Expert Systems**				
		5.1	Architecture of expert systems,	T1, T2	2	Chalk & Talk
		5.2	Roles of expert systems	T1, T2	1	Chalk & Talk
		5.3	Knowledge Acquisition Meta knowledge Heuristics	T1, T2	2	Chalk & Talk
		5.4	Typical expert systems– MYCIN,	T1, T2	1	Chalk & Talk
		5.5	DART, XCON	T1, T2	2	Chalk & Talk
		5.6	Expert systems shells	T1, T2	2	Student seminar
						TOTAL: 61
MID II EXAMINATION						
END EXAMINATIONS						

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TEXT BOOKS:

1. Kevin Night and Elaine Rich, Nair B., "Artificial Intelligence (SIE)", Mc Graw Hill
2. S. Russel and P. Norvig, "Artificial Intelligence – A Modern Approach", Second Edition, Pearson Education.

REFERENCES BOOKS:

1. David Poole, Alan Mackworth, Randy Goebel,"Computational Intelligence: a logical Approach", Oxford University Press.
2. G. Luger, "Artificial Intelligence: Structures and Strategies for complex Problem-solving", Fourth Edition, Pearson Education.
3. J. Nilsson, "Artificial Intelligence: A new Synthesis", Elsevier Publishers.
4. Artificial Intelligence, SarojKaushik, CENGAGE Learning.

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Narasaraopeta Engineering College
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Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF IT & CSE (AI)
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Period/Week	Section
-	UHV-2(R23)	II-I	CSE(AI)	3	

COURSE OUTCOMES: Student is able to

CO1: : Define the terms like Natural Acceptance, Happiness and Prosperity (K1)

CO2: Identify one's self, and one's surroundings (family, society nature) (K4)

CO3: Apply what they have learnt to their own self in different day-to-day settings in real life (K3)

CO4: Relate human values with human relationship and human society. (K6)

CO5: Justify the need for universal human values and harmonious existence (K5)

CO6: Develop as socially and ecologically responsible engineers.(K6)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Define the terms like Natural Acceptance, Happiness and Prosperity		**Unit-1. Introduction to Value Education**			
		1.1	Right Understanding, Relationship and Physical Facility	T1,R1	1	Chalk & Talk
		1.2	Understanding Value Education	T1R1	1	Chalk & Talk,PPT
		1.3	Practice Session PS1 Sharing about Oneself (PS1)	T1, R1	1	Presentation by student
		1.4	Self-exploration as the Process for Value Education	T1,R1	1	Chalk & Talk
		1.5	Continuous Happiness and Prosperity – the Basic Human Aspirations	T1,R1	1	Chalk & Talk,PPT
		1.6	Practice Session PS2 Exploring Human Consciousness(PS2)	T1,R1	1	Presentation by student
		1.7	Happiness and Prosperity – Current Scenario	T1,R1	1	Chalk & Talk,PPT
		1.8	Method to Fulfill the Basic Human Aspirations	T1,R1	1	Chalk & Talk,PPT
		1.9	Practice Session PS3 Exploring Natural Acceptance(PS3)	T1,R1	1	Presentation by student
2	CO2: Identify one's self, and one's surroundings (family, society nature)		**Unit-2. Harmony in the Human Being**			
		2.1	Understanding Human being as the Co-existence of the self and the body.	T1, R1	1	Chalk & Talk,PPT
		2.2	Distinguishing between the Needs of the self and the body	T1, R1		Chalk & Talk

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	(family, society nature)	2.2	Distinguishing between the Needs of the self and the body	T1, R1	1	Chalk & Talk
		2.3	Practice Session PS4 Exploring the difference of Needs of self and body.(PS4)	T1, R1	1	Chalk & Talk,PPT
		2.4	The body as an Instrument of the self	T1, R1	1	Chalk & Talk
		2.5	Practice Session PS5 Exploring Sources of Imagination in the self (PS5)	T1, R1	1	Presentation by student
		2.6	Harmony of the self with the body	T1, R1	1	Chalk & Talk
		2.7	Programme to ensure self-regulation and Health	T1, R1	1	Chalk & Talk
		2.8	Session PS6 Exploring Harmony of self with the body	T1, R1	1	Presentation by student
3	CO3: Apply what they have learnt to their own self in different day-to-day settings in real life.		**Unit-3. Harmony in the Family and Society**			
		3.1	Harmony in the Family – the Basic Unit of Human Interaction	T1, R1	1	Chalk & Talk
		3.2	Trust' – the Foundational Value in Relationship	T1, R1	1	Chalk & Talk,PPT
		3.3	Practice Session PS7 Exploring the Feeling of Trust	T1, R1	1	Presentation by student
		3.4	Respect – as the Right Evaluation	T1, R1	1	Chalk & Talk
		3.5	Practice Session PS8 Exploring the Feeling of Respect	T1, R1	1	Presentation by student
		3.6	Other Feelings, Justice in Human-to-Human Relationship	T1, R1	1	Chalk & Talk
		3.7	Understanding Harmony in the Society	T1, R1	1	Chalk & Talk
		3.8	Vision for the Universal Human Order	T1, R1	1	Chalk & Talk
		3.9	Practice Session PS9 Exploring Systems to fulfil Human Goal	T1, R1	1	Presentation by student

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		MID I EXAMINATION				
4	CO4:Relate human values with human relationship and human society, Justify the need for universal human values and harmonious existence	**Unit-4 Harmony in the Nature/Existence**				
		4.1	Understanding Harmony in the Nature	T1,R1	1	Chalk & Talk
		4.2	Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature	T1,R1	1	Chalk & Talk
		4.3	Practice Session PS10 Exploring the Four Orders of Nature	T1,R1	1	Presentation by student
		4.4	Realizing Existence as Co-existence at All Levels	T1,R1	1	Chalk & Talk
		4.5	The Holistic Perception of Harmony in Existence	T1,R1	1	Chalk & Talk
		4.6	Practice Session PS11 Exploring Co-existence in Existence	T1,R1	1	Presentation by student
5	CO5: Justify the need for universal human values and harmonious existence, Develop as socially and ecologically responsible engineers	**Unit 5. Implications of the Holistic Understanding – a Look at Professional Ethics**				
		5.1	Natural Acceptance of Human Values	T1,R1	1	Chalk & Talk
		5.2	Definitiveness of (Ethical) Human Conduct	T1,R1	1	Chalk & Talk
		5.3	Practice Session PS12 Exploring Ethical Human Conduct	T1,R1	1	Presentation by student
		5.4	A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order	T1,R1	1	Chalk & Talk
		5.5	Competence in Professional Ethics	T1,R1	1	Chalk & Talk
		5.6	Practice Session PS13 Exploring Humanistic Models in Education	T1,R1	1	Presentation by student
		5.7	Holistic Technologies, Production Systems and Management Models-Typical Case Studies	T1,R1	1	Chalk & Talk

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		5.8	Strategies for Transition towards Value-based Life and Profession	T1,R1	1	Chalk & Talk
		5.9	Practice Session PS14 Exploring Steps of Transition towards Universal Human Order	T1,R1	1	Presentation by student
				Total	42	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Textbook:

1.R R Gaur, R Asthana, G P Bagaria, a Foundation Course in Human Values and Professionals, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1.

Reference:

1. JeevanVidya: EkParichaya, A Nagaraj, JeevanVidya Prakashan, Amarkantak, 1999.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallamanda(Post), Narasaraopet- 522601

DEPARTMENT OF CSE(AI)
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2207	DIGITAL LOGIC & COMPUTER ORGANIZATION	II	AI	6	A & B

After completion of this course the student should be able to

CO	Course Outcome Statement	
CO1	Analyze the data representation and digital logic circuits.	[K4]
CO2	Analyze the basic structure of computers.	[K4]
CO3	Analyze the computer arithmetic algorithms	[K4]
CO4	Analyze the processor, memory and input-output organizations.	[K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO 1:** Analyze the data representation and digital logic circuits. [K4]		**Unit-1. Data Representation**			
		1.1	Number system	T1,T2, R2	2	Chalk & Talk
		1.2	Fixed point Representation	T1, T2, R2	1	Chalk & Talk
		1.3	Floating Point Representation	T1, T2, R2	1	Chalk & Talk
		1.4	Number base conversions	T1, T2, R2	1	Chalk & Talk
		1.5	Octal and Hexa decimal Numbers	T1, T2, R1	2	Chalk & Talk PPT
		1.6	complements	T1, T2, R1	1	Chalk & Talk
		1.7	Signed binary numbers, Binary codes.	T1, T2, R1	2	Chalk & Talk
		1.8	**Digital Logic Circuits-I** Basic Logic Functions, Logic gates	T1, T2, R1	2	Chalk & Talk,
		1.9	universal logic gates	T1, T2, R1	1	Chalk & Talk,
		1.10	K-Map Simplification	T1, T2, R1	2	Chalk & Talk,
		1.11	Combinational Circuits	T1, T2, R1	1	Chalk & Talk,
		1.12	Decoders, Multiplexers.	T1, T2, R1	1	Chalk & Talk,

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ASSIGNMENT I- EXAMINATION

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2	CO2: Analyze the basic structure of computers. [K4]	**Unit-2. Digital Logic Circuits-II**				
		2.1	Sequential Circuits	T1, T2,R1	1	Chalk & Talk,
		2.2	Flip Flops, Binary counters	T1, T2,R1	1	Chalk & Talk,
		2.3	Registers, Shift Registers	T1, T2,R1	2	Chalk & Talk,
		2.4	Ripple counters.	T1, T2,R1	1	Chalk & Talk, PPT
		2.5	Basic Structure of Computers Computer Types, Functional units	T1, T2,R1	1	Chalk & Talk, PPT
		2.6	Basic operational concepts, Bus structures,	T1, T2,R1	1	Chalk & Talk, PPT
		2.7	Software, Performance, multiprocessors and multi computers	T1, T2,R1	2	Chalk & Talk, PPT
		2.8	Computer Generations, Von-Neumann Architecture.	T1, T2,R1	1	Chalk & Talk, PPT
		MID-I EXAMINATION				
3	CO3: Analyze the computer arithmetic algorithms [K4]	**Unit-3. Computer Arithmetic**				
		3.1	Addition and Subtraction of Signed Numbers	T1, T2, R2	1	Chalk & Talk
		3.2	Design of Fast Adders, Multiplication of Positive Numbers	T1, T2, R2	2	Chalk & Talk, PPT
		3.3	Signed-oper and Multiplication, Fast Multiplication,	T1, T2, R2	1	Chalk & Talk , PPT
		3.4	integer Division, Floating-Point Numbers and Operations	T1, T2, R2	1	Chalk & Talk
		3.5	Processor Organization Fundamental Concepts	T1, T2, R2	2	Chalk & Talk
		3.6	Execution of a Complete Instruction, Multiple-Bus Organization	T1, T2, R2	2	Chalk & Talk
		3.7	Hardwired Control and Multiprogrammed Control.	T1, T2, R2	1	Chalk & Talk
4	CO4: Analyze the processor, memory and input-output organizations. [K4]	**Unit 4 : The Memory Organization**				
		4.1	Basic Concepts, Semiconductor RAM Memories, Read-Only Memories,	T1, T3,R3	2	Chalk & Talk
		4.2	Speed, Size and Cost, Cache Memories	T1, T3,R3	1	Chalk & Talk
		4.3	Performance Considerations, Virtual Memories,,	T1, T3,R3	1	Chalk & Talk
		4.4	MemoryManagement equirements, Secondary Storage	T1, T3,R3	1	Chalk & Talk,
		ASSIGNMENT II EXAMINATION				

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5	CO4: Analyze the processor, memory and input-output organizations. [K4]	**Unit 5. Input/Output Organization**				
		5.1	Accessing I/O Devices	T1, R1	1	Chalk & Talk
		5.2	Interrupts, Processor Examples	T1, R1	2	PPT
		5.3	Direct Memory Access	T1, R1	1	Chalk & Talk
		5.4	Buses, Interface Circuits	T1, R1	1	Chalk & Talk
		5.5	Standard I/O Interfaces.	T1, R1	1	Chalk & Talk
TOTAL: 48						
MID II EXAMINATION						
END EXAMINATIONS						

Activity Plan for Term Work:

S.No	Topic/Activity	Term Work Component	Planned Hours
1	Signed binary numbers, Binary codes. K-Map Simplification, Flip Flops, Binary counters, Performance	Seminar, Hands-On	9
2	Fast Multiplication, Fundamental Concepts, Multiple-Bus Organization,	Collaborative Learning, Hands-On or Flipped learning Activity	13
3	Sliptest	Sliptest	10
4	Exploring online tutorials and courses on SQL	Online learning platforms **(MOOCs (Massive Open Online Courses), Edureka, Coursera** and **Infosys Springboard / online learning activity.**	10
Total No. of Hours : 42			

TEXT BOOKS: Textbooks:

1. Computer Organization, Carl Hamacher, Zvonko Vranesic, SafwatZaky,6thedition, McGrawHill
2. Digital Design, 6thEdition, M.Morris Mano, Pearson Education.
3. Organization and Architecture,William Stallings, 11thEdition, Pearson.

Reference Books:

1. Computer Systems Architecture, M.Moris Mano, 3rdEdition, Pearson
2. Computer Organization and Design,David A.Paterson, JohnL. Hennessy, Elsevier
3. Fundamentals of Logic Design, Roth, 5thEdition, Thomson

ONLINE LEARNING RESOURCES:
https://nptel.ac.in/courses/106/103/106103068/

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DEPARTMENT OF CSE(ARTIFICIAL INTELLIGENCE)
LESSON PLAN

Course Code	Course Title (Regulation)	Year/Sem	Branch	Contact Periods/Week	Section
R23CC2204	DATABASE MANAGEMENT SYSTEM (R23)	II/II	CSE(AI)	5	A&B

LESSON PLAN

COURSE OUTCOMES

After completion of the course, the students would be able to:

CO 1: Interpret the fundamentals of DBMS. [K2]
CO 2: Analyze relational database designing. [K4]
CO 3: Develop queries in RDBMS [K3]
CO 4: Analyze database design methodology and normalization process [K4].
CO 5: Analyze transaction concepts and File indexing. [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
Unit-1						
1	**CO 1:** Interpret the fundamentals of DBMS. [K2]	1.1	Introduction: Database system	T1, T2	2	Chalk & Talk + PPT
		1.2	Characteristics (Database Vs File System)	T1, T2	2	Chalk & Talk
		1.3	Database Users, Advantages of Database systems, Database applications.	T1, T2	2	Chalk & Talk + PPT
		1.4	Brief introduction of different Data Models; Concepts of Schema, Instance and data independence;	T1, T2	2	Chalk & Talk + PPT
		1.5	Three tier schema architecture for data independence;	T1, T2	2	Chalk & Talk + PPT
		1.6	Database system structure, environment, Centralized and Client Server architecture for the database.	T1, T2	2	Chalk & Talk + PPT
		1.7	Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set	T1, T2	1	Chalk & Talk + PPT
		1.8	constraints, sub classes, super class, inheritance, specialization, generalization using ER Diagrams.	T1, T2	2	Chalk & Talk + PPT

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ASSIGNMENT-I						
Unit-2						
2	CO2:Analyze relational database designing. [K4]	2.1	Relational Model: Introduction to relational model, concepts of domain, attribute, tuple, relation, importance of null values	T1, T2	2	Chalk & Talk + PPT
		2.2	constraints (Domain, Key constraints, integrity constraints) and their importance,	T1	2	Chalk & Talk + PPT
		2.3	Relational Algebra, Relational Calculus	T1	2	Chalk & Talk + PPT
		2.4	BASIC SQL: Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update).	T1	2	Chalk & Talk + PPT
Unit-3						
3	CO3:Develop queries in RDBMS [K3]	3.1	SQL: Basic SQL querying (select and project) using where clause, arithmetic & logical operations	T1	2	Chalk & Talk
		3.2	SQL functions (Date and Time, Numeric, String conversion). Creating tables with relationship	T1	1	PPT
		3.3	Implementation of key and integrity constraints, nested queries, sub queries.	T1	2	Chalk & Talk
		3.4	grouping, aggregation, ordering	T1	1	Chalk & Talk
		3.5	Implementation of different types of joins, view(updatable and non-updatable), relational set operations.	T1	2	Chalk & Talk
ASSIGNMENT-II						
Unit-4						
4	CO4: Analyze database design methodology and normalization process [K4].	4.1	Schema Refinement (Normalization):Purpose of Normalization or schema refinement	T1, T2	2	Chalk & Talk + PPT
		4.2	concept of functional dependency,	T1, T2	3	Chalk & Talk
		4.3	Normal forms based on functional dependency Lossless join and dependency preserving decomposition	T1, T2	2	Chalk & Talk + PPT
		4.4	1NF,2NFand 3NFconcept of surrogate key, Boyce-Codd normal form(BCNF), MVD, Fourth normal form(4NF), Fifth	T1, T2	1	Chalk & Talk

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			Normal Form (5NF).			
Unit-5						
5	**CO5:**Analyze transaction concepts and File indexing. [K2]	5.1	Transaction Concept: Transaction State, ACID properties	T1, T2	1	Chalk & Talk
		5.2	Concurrent Executions, Serializability, Recoverability	T1, T2	2	Chalk & Talk + PPT
		5.3	Implementation of Isolation, Testing for Serializability, lock based, time stamp based	T1, T2	2	Chalk &. Talk
		5.4	optimistic, concurrency protocols, Deadlocks, Failure Classification, Storage, Recovery and Atomicity, Recovery algorithm.	T2	2	PPT
		5.5	Introduction to Indexing Techniques: B+ Trees, operations on B+Trees, Hash Based Indexing:	T2	2	PPT
				Total	48	

Activity Plan for Term Work:

S.No	Topic/Activity	Term Work Component	Planned Hours
1	1NF, 2NF and 3 Concept of surrogate key, Boyce- Codd normal form(BCNF), MVD, Fourth normal form(4NF), Fifth Normal Form (5NF)	Seminar, Hands-On	9
2	BASIC SQL: Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update).	Collaborative Learning, Hands-On or Flipped learning Activity	8
3	BASIC SQL: Database schema, data types, table definitions (create, alter), different DML operations (insert, delete, update).	Project based learning, Collaborative Learning, Hands-On with SQLDATABASE	5
4	Sliptest	Sliptest	10
5	Exploring online tutorials and courses on SQL	Online learning platforms **(MOOCs (Massive Open Online Courses), Edureka, Coursera** and **Infosys Springboard / online learning activity.**	10
Total No. of Hours : 42			

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Text Books:	
T1	Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
T2	Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)
Reference Books:	
R1	Introduction to Database Systems, 8thedition, C J Date, Pearson.
R2	Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson
R3	Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.
Web Resources:	
1	https://nptel.ac.in/courses/106/105/106105175/
2	https://infyspringboard.onwingspan.com/web/en/app/toc/iex_auth_012758066672820 22456_shared/overview

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NARASARAOPETA ENGINEERING COLLEGE
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DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2202	Probability and Statistics	II-II	CSE (AI)	5	A,B

Course Outcomes:

After completion of this course, the students would be able to:

CO221.1	Classify the concept of data science and its importance	(K2)
CO221.2	Interpret the association of characteristics and through correlation and regression tools	(K4)
CO221.3	Apply discrete and continuous probability distributions	(K3)
CO221.4	Design the components of a classical hypothesis test	(K6)
CO221.5	Infer the statistical internal methods based on small and large sample tests	(K4)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT-I : Descriptive Statistics and methods for data science			
1	CO-1: Classify the concept of data science and its importance (K2).	1.1	Introduction to Data science	T1, T2, R1	1	Chalk & Talk PPT
		1.2	Population Vs sample, collection of Data	T1, T2, R1	1	Chalk & Talk
		1.3	Types of Variables	T1, T2, R1	1	Chalk & Talk
		1.4	Data Visualization charts	T1, T2, R2	1	Chalk & Talk
		1.5	Mean, median,, mode	T1, T2, R1	1	Chalk & Talk
		1.6	Geometric mean, Harmonic mean	T1, T2, R1	1	Chalk & Talk
		1.7	Range, variance,	T1, T2, R1	1	Chalk & Talk
		1.8	Mean & deviation	T1, T2, R1	1	Chalk & Talk
		1.9	Skewness	T1, T2, R1	1	Chalk & Talk
		1.10	kurtosis	T1, T2, R1	1	Chalk & Talk
			ASSIGNMENT-I EXAMINATION			
2	CO-2: Interpret the association of characteristics and through correlation and regression tools (K4).		**UNIT – II: CORRELATION AND CURVE FITTING**			
		2.1	Types of correlation	T1, T2,R1	1	Chalk & Talk PPT
		2.2	Coefficient of correlation	T1, T2,R1	1	Chalk & Talk,
		2.3	Rank correlation coefficient	T1, T2,R1	1	Chalk & Talk,
		2.4	Regression Coefficient and Regression Equation	T1, T2,R1	1	Chalk & Talk
		2.5	Multiple linear Regression	T1, T2,R1	1	Chalk & Talk
		2.6	Fitting a straight Line-Method of least squares	T1, T2,R1	1	Chalk & Talk
		2.7	Fitting a Parabola	T1, T2,R1	1	Chalk & Talk
		2.8	Fitting a Exponential curve	T1, T2,R2	1	Chalk & Talk,
		2.9	Fitting a Power Curve	T1, T2,R1	1	Chalk & Talk
			MID-I EXAMINATION			
			UNIT-III :Probability Distributions			

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3	CO-3: Apply discrete and continuous probability distributions (K3).	3.1	Introduction to Probability	T1, T2, R1	1	Chalk & PPT
		3.2	Conditional Probability, aye's theorem	T1, T2, R1	1	Chalk & Talk
		3.3	Discrete Random Variables	T1, T2, R1	1	Chalk & Talk,
		3.4	Continuous Random variables	T1, T2, R3	1	Chalk & Talk,
		3.5	Distribution function	T1, T2, R1	1	Chalk & Talk
		3.6	Mathematical expectation	T1, T2, R1	1	Chalk & Talk,
		3.7	variance	T1, T2, R1	1	Chalk & Talk
		3.8	Binomial distribution	T1, T2, R3	1	Chalk & Talk Student seminar
		3.9	Poisson and uniform distribution	T1, T2, R1	1	Chalk & Talk
		3.10	Normal Distribution	T1, T2, R1	1	Chalk & Talk
			ASSIGNMENT-II EXAMINATION			
			UNIT-IV :SAMPLING THEORY			
4	CO-4: Design the components of a classical hypothesis test (K6).	4.1	Introduction to Sampling Theory	T1, T2,R1	1	Chalk & Talk, PPT
		4.2	Population Vs sample	T1, T2,R1	1	Chalk & Talk
		4.3	Sampling distribution of means	T1, T2,R1	1	Chalk & Talk
		4.4	Sampling distribution of variances	T1, T2,R1	1	Chalk & Talk
		4.5	Central Limit theorem	T1, T2,R1	1	Chalk & Talk
		4.6	Introduction to t distribution	T1, T2,R1	1	Chalk & Talk
		4.7	Point Estimation	T1, T2,R2	1	Chalk & Talk
		4.8	Interval Estimation	T1, T2,R1	1	Chalk & Talk,
		4.9	Maximum error of estimate	T1, T2,R1	1	Chalk & Talk
			UNIT-V: TESTING OF HYPOTHESIS			
5	CO-5: Infer the statistical internal methods based on small and large sample tests (K4).	5.1	Introduction to Tests of Hypothesis	T1, T2, R1	1	Chalk & Talk, PPT
		5.2	Formulation of Null Hypothesis, critical region, level of significance	T1, T2,R1	1	Chalk & Talk
		5.3	One Tail, Two tailed Tests Type-I, and Type-II errors	T1, T2,R1	1	Chalk & Talk Tutorial
		5.4	Large sample test -single mean	T1, T2,R1	1	Chalk & Talk
		5.5	Large sample test, two means	T1, T2,R1	1	Chalk & Talk
		5.6	Large sample test -single proportion	T1, T2,R1	1	Chalk & Talk
		5.7	Large sample test -Double proportion	T1, T2,R1	1	Chalk & Talk
		5.8	Small samples-Students t Test	T1, T2,R1	1	Chalk & Talk
		5.9	F-Test	T1, T2,R4	1	Chalk & Talk, web resources
		5.10	Chi Square Test	T1, T2,R1	1	Chalk & Talk Student seminar
			MID-II EXAMINATION			
						TOTAL:48

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S.No	Topic/Activity	Term Work Component	Planned Hours
1	Types of variables, Data Visualization charts, Skewness, kurtosis, Distribution function, Sampling distribution of means and variance.	Seminar	12
2	Coefficient of correlation, Conditional Probability, Introduction to t distribution, f distribution, Chi Square distribution,	Flipped Learning	8
3	Slip test	Slip test	10
4	Mean deviation, S.D, Fitting a Parabola, Normal Distribution, Tests of Hypothesis	Problem Solving	12
Total No. of Hours : 42			

Text Books:

1.Miller and Freund's, "Probability and Statistics for Engineers",7/e, Pearson, 2008.
2.S. C. Gupta and V.K. Kapoor, "Fundamentals of Mathematical Statistics", 11/e, Sultan Chand & Sons Publications, 2012.

References:

1.Shron L. Myers, Keying Ye, Ronald E Walpole, Probability and Statistics Engineers and the Scientists,8th Edition, Pearson 2007.
2. Jay l. Devore, Probability and Statistics for Engineering and the Sciences, 8 th Edition, cengage.
3. Sheldon M. Ross, "Introduction to probability and statistics Engineers and the Scientists", 4 th Edition, Academic Foundation, 2011.
4.Johannes Ledolter and Robert V. Hogg, "Applied statistics for Engineers and Physical Scientists", 3 rd Edition, Pearson, 2010.

WEB SOURCE REFERENCES:

1	https://archive.nptel.ac.in/courses/111/105/111105090/
2	https://onlinecourses.nptel.ac.in/noc21_ma74/preview
3	https://archive.nptel.ac.in/courses/111/106/111106112/
4	https://archive.org/details/NPTEL-Math-Probability_and_Statistics
5	https://onlinecourses.nptel.ac.in/noc22_ma81/preview

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Year /Sem	Branch	Contact Periods/ Week	Sections
R23CC2206	Machine Learning (R23)	II/II	CAI	5	A,B

LESSON PLAN

COURSE OUTCOMES: After the successful completion of this course, the students will be able to:

CO1: Analyze and Design Intelligent Agents [K4]

CO2: Apply Search Algorithms to Problem Solving [K3]

CO3: Apply techniques for constraint propagation and reasoning under uncertainty [K3]

CO4: Utilize inductive learning, decision trees, and explanation-based learning for learning from observation. [K3]

CO5: Analyze and compare typical expert systems such as MYCIN, DART, and XCON [K4]

Unit No	Course Outcome	Topics/Activity	Ref Textbook	Total Periods	Delivery Method
Unit I: Introduction to Machine Learning					
1	CO1: Analyze and Design Intelligent Agents [K4]	Introduction to Machine Learning: Evolution of Machine Learning	T1	1	Chalk & Talk
		Paradigms for ML	T1	1	Chalk & Talk
		Learning by Rote,Learning by Induction	T1 &T3	1	Chalk & Talk
		Reinforcement Learning	T1&T3	1	Chalk & Talk
		Types of Data, Matching,Data Sets,Data Representation	T1	1	Chalk & Talk
		Stages in Machine Learning, Data Acquisition	T1	1	Chalk & Talk
		Model Selection, Model Learning, Model Evaluation	T1	1	Chalk & Talk
		Model Prediction, Search and Learning	T1	1	Chalk & Talk
		Assignment1			
Unit II: Nearest Neighbor-Based Models					
2	CO2: Apply Search Algorithms to Problem Solving [K3]	Nearest Neighbor-Based Models:Introduction to Proximity Measures, Distance Measures	T1	1	Chalk & Talk
		Non-Metric Similarity Functions, Proximity Between Binary Patterns	T1	2	Chalk & Talk
		Different Classification Algorithms Based on the Distance Measures	T1	1	Chalk & Talk
		K-Nearest Neighbor Classifier	T1	1	Chalk & Talk
		Radius Distance Nearest Neighbor Algorithm	T1	1	Chalk & Talk

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		KNN Regression	T1	1	Chalk & Talk
		Performance of Classifiers	T1	1	Chalk & Talk
		Performance of Regression Algorithms.	T1	1	Chalk & Talk
		Mid1-Exam			
Unit III: Models Based on Decision Trees					
3	CO3: Apply techniques for constraint propagation and reasoning under uncertainty [K3]	Decision Trees for Classification	T1	1	Chalk & Talk
		Impurity Measures, Properties	T1	1	Chalk & Talk
		Regression Based on Decision Trees	T1	2	Chalk & Talk
		Bias–Variance Trade-off	T1	1	Chalk & Talk
		Random Forests for Classification and Regression.	T1	1	Chalk & Talk
		The Bayes Classifier: Introduction to the Bayes Classifier	T1	1	Chalk & Talk
		The Bayes Classifier and its Optimality,	T1	1	Chalk & Talk
		Multi-Class Classification | Class Conditional Independence and Naive Bayes Classifier (NBC)	T1	2	Chalk & Talk
		Assignment-2			
Unit IV:Linear Discriminants for Machine Learning					
4	CO4: Utilize inductive learning, decision trees, and explanation-based learning for learning from observation. [K3]	Introduction to Linear Discriminates, Linear Discriminant for Classification	T1	1	Chalk & Talk
		Perceptron Classifier, Perceptron Learning Algorithm	T1	2	Chalk & Talk
		Support Vector Machines,Non-linear SVM	T1&T3	1	PPT
		Logistic Regression, Linear Regression	T1	1	Chalk & Talk
		Multi-Layer Perceptrons (MLPs), Backpropagation for Training an MLP.	T1&T3	2	PPT
		Kernel Trick	T1&T3	2	Chalk & Talk
Unit V: Clustering					
5	CO5: Analyze and compare typical expert systems such as MYCIN, DART, and XCON [K4]	Introduction to Clustering, Partitioning of Data	T1	1	PPT
		Clustering of Patterns, Divisive Clustering,	T1&T3	1	Chalk & Talk
		Agglomerative Clustering, Partitional Clustering	T1&T3	2	Chalk & Talk
		KMeans Clustering, Soft Partitioning, Soft Clustering	T1&T3	1	Chalk & Talk
		Fuzzy C-Means Clustering, Rough Clustering	T1&T3	2	PPT
		Rough K-Means Clustering Algorithm	T1&T3	2	Chalk & Talk
		Expectation Maximization-Based Clustering, Spectral Clustering		1	PPT
		Mid 2-Exam			
Total Number of Hours				48	

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Other Teaching Activities:

S.No	Topic/Activity	Term Work Component	Planned Hours
1	Paradigms for ML	Seminars	1
2	Stages in Machine Learning		1
3	Model Selection, Model Learning, Model Evaluation, Model Prediction		2
4	K-Nearest Neighbor Classifier		2
5	KNN Regression		2
6	Decision Trees for Classification		1
7	Regression Based on Decision Trees		2
8	The Bayes Classifier		2
9	Linear Discriminant for Classification		1
10	Perceptron Classifier,Multi-Layer Perceptrons (MLPs),		2
11	Supervise learning	Mini Project	6
12	Unsupervised learning		
13	Slip Tests	Slip Tests	10
14	Certification on Scikit-learn	MyGreat Learning Certification (https://olympus.mygreatlearning.com/courses/62481)	5
15	Certification on Introduction to TensorFlow and Kera's	MyGreat Learning Certification (https://olympus.mygreatlearning.com/courses/31734)	5
Total Number of Hours			42

TEXTBOOKS:

Text Books: 1. "Machine Learning Theory and Practice", M N Murthy, V S Ananthanarayana, Universities Press (India), 2024

Reference Books:

1. "Machine Learning", Tom M. Mitchell, McGraw-Hill Publication, 2017

2. 2. "Machine Learning in Action",Peter Harrington, DreamTech

3. 3. "Introduction to Data Mining", Pang-Ning Tan, Michel Stenbach, Vipin Kumar, 7th Edition, 2019

4. WEB RESOURCES

1. https://onlinecourses.nptel.ac.in/noc24_cs81/preview
2. https://www.youtube.com/@MaheshHuddar/playlists
3. **https://www.tutorialtpoint.net/p/machine-learning-tutorial.html**

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DEPARTMENT OF INFORMATION TECHNOLOGY
LESSON PLAN 2024-25

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R23CC2208	OPTIMIZATION TECHNIQUES)	II/II	AI	4	A&B

COURSE OUTCOMES: Students are able to

SNO	Course Outcome Statement
CO1	**Formulate** the optimization problem, without and with constraints, by using design variables from an engineering design problem **(K6)**
CO2	**Apply** classical optimization techniques to minimize or maximize a multi-variable Objective function, without or with constraints, and arrive at an optimal solution. **(K3)**
CO3	**Apply** and Solve transportation and assignment problem by using Linear programming Simplex method. **(K3)**
CO4	**Apply** gradient and non-gradient methods to nonlinear optimization problems and use Interior or exterior penalty functions for the constraints to derive the optimal solutions. **(K3)**.
CO5	**Formulate** Dynamic programming technique to inventory control, production planning, Engineering design problems etc. to reach a final optimal solution from the current optimal solution. **(K6)**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: **Formulate** the optimization problem, without and with constraints, by using design variables from an engineering design problem (K6)		**UNIT– I**			
		1.1	Statement of an Optimization problem	T1, T2, R1	1	Chalk, Talk & PPT
		1.2	design vector, design constraints, constraint surface	T1, T2, R1	1	Chalk & Talk
		1.3	Single variable Optimization, multivariable Optimization without constraints	T1, R1	2	Chalk & Talk
		1.4	necessary and sufficient conditions for minimum/maximum,multivariable Optimization with equality constraints	T1, T2, R1	2	Chalk & Talk
		1.5	Solution by method of Lagrange multipliers, multivariable Optimization with inequality constraints, Kuhn – Tucker conditions	T1, T2, R1	2	Chalk & Talk
2	CO2: **Apply** classical optimization techniques to minimize or maximize a multi-variable Objective function, without or with constraints, and arrive at an optimal solution. (K3)		**UNIT-II** Assignment – 1			
		2.1	Standard form of a linear programming problem, geometry of linear programming problems	T1, R1	2	Chalk & Talk
		2.2	geometry of linear programming problems,	T1, R1	1	Chalk & Talk
		2.3	solution of a system of linear simultaneous equations, pivotal reduction of a general system of equations,	T1, R1	2	Chalk & Talk
		2.4	Simplex algorithm.	T1, T2, R2	1	Chalk & Talk
	CO3		**MID I EXAMINATION**			
	Apply and		**UNIT-III**			
		3.1	Finding initial basic feasible solution by north –	T1,R2	2	Chalk, Talk

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Activity Plan for Term Work:

S.No	Topic/Activity	Term Work Component	Planned Hours
1.	objective function, objective function surfaces	Collaborative Learning	3
2	classification of Optimization problems	Seminar	3
3	Motivation to the simplex method	Seminar	5
4	linear programming, definitions and theorems,	Collaborative Learning	5
5	Special cases in transportation problem.	**Case Study**	4
6	Characteristics of a constrained problem,	**NPTEL**	4
7	Dynamic programming multistage decision processes, types	Collaborative Learning	4
			Total No. of Hours : 28

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Engineering optimization: Theory and practice", Singiresu. S.Rao, New Age International (P) Limited, 3rd enlarged edition, 2013
T2	"Introductory Operations Research", H.S. Kasene& K.D. Kumar, Springer (India), Pvt.LTd.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	"Optimization Methods in Operations Research and systems Analysis", by K.V. Mital and C. Mohan, New Age International (P) Limited, Publishers, 3rd edition, 1996.
R2	Operations Research, Dr.S.D.Sharma, Kedarnath, Ramnath& Co.

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DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CY2201	NUMBER THEORY & APPLICATIONS	II-II	CSE(CS)	5	A

Course Outcomes:

After completion of this course, the students would be able to:

CO221.1	Apply the knowledge of GCD and Prime Factorization	(K3)
CO221.2	Explain principles of congruence	(K2)
CO221.3	Develop the knowledge of congruence applications	(K3)
CO221.4	Make use of finite fields and primality	(K3)
CO221.5	Develop various encryption methods and its applications	(K3)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO-1: Apply the knowledge of GCD and Prime Factorization (K3).		**UNIT – I: Integers, Greatest Common Divisors and Prime Factorization**			
		1.1	The well-ordering property	T1, T2, R1	1	Chalk & Talk, PPT
		1.2	Divisibility-Representation of integers	T1, T2, R1	1	Chalk & Talk
		1.3	Computer operation with integers	T1, T2, R1	1	Chalk & Talk
		1.4	Prime numbers-greatest common divisors	T1, T2, R1	1	Chalk & Talk, PPT
		1.5	The Euclidean algorithm	T1, T2, R1	1	Chalk & Talk
		1.6	The fundamental theorem of arithmetic	T1, T2, R1	1	Chalk & Talk Student Seminars
		1.7	The fundamental theorem of arithmetic	T1, T2, R1, R2	1	Chalk & Talk, PPT
		1.8	The fundamental theorem of arithmetic	T1, T2, R1	1	Chalk & Talk PPT
		1.9	Factorization of integers and the Fermat numbers	T1, T2, R1	1	Chalk & Talk
		1.10	Factorization of integers and the Fermat numbers	T1, T2, R1	1	Chalk & Talk
		1.11	Linear Diophantine equations	T1, T2, R1, R2	1	Tutorials
		1.12	Linear Diophantine equations	T1, T2, R1, R2	1	Tutorials
			ASSIGNMENT-I EXAMINATION			
			UNIT – II: Congruence			
2	CO-2: Explain principles of	2.1	Introduction to congruence	T1, T2,R1	1	Chalk & Talk, PPT
		2.2	Linear congruence	T1, T2, R1	1	Chalk & Talk
		2.3	Linear congruence	T1, T2, R1	1	Chalk & Talk

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	congruence (K2).	2.4	Linear congruence	T1, T2, R1	1	Chalk &
		2.5	The Chinese reminder theorem	T1, T2, R1	1	Chalk &
		2.6	The Chinese reminder theorem	T1, T2, R1	1	PPT
		2.7	The Chinese reminder theorem	T1, T2, R1, R2	1	Chalk & Talk
		2.8	The Chinese reminder theorem	T1, T2, R1. R3	1	Chalk & Talk, PPT
		2.9	Systems of linear congruence	T1, T2, R1, R2	1	Chalk & Talk
		2.10	Systems of linear congruence	T1, T2, R1	1	Chalk & Talk Students Seminars
		2.11	Systems of linear congruence	T1, T2, R1, R2	1	Chalk & Talk, Tutorials
		2.12	Systems of linear congruence	T1, T2, R1	1	Chalk & Talk
	MID-I EXAMINATION					
3	CO-3: Develop the knowledge of congruence applications (K3).		**UNIT – III: Applications of Congruence**			
		3.1	Divisibility tests	T1, T2, R1, R2	1	Chalk & Talk, PPT.
		3.2	The perpetual calendar	T1, T2, R1, R2	1	Chalk & Talk
		3.3	Round-robin tournaments	T1, T2, R1, R2	1	PPT.
		3.4	Computer file storage and hashing functions	T1, T2, R1, R2	1	Chalk & Talk NPTEL
		3.5	Wilson's theorem and Fermat's little theorem	T1, T2, R1, R2	1	Chalk & Talk
		3.6	Pseudo primes	T1, T2, R1, R2	1	Chalk & Talk Student Seminars
		3.7	Euler's theorem	T1, T2, R1, R2	1	Chalk & Talk
		3.8	Euler's theorem	T1, T2, R1, R2	1	Chalk & Talk PPT
		3.9	Euler's phi-function	T1, T2, R1, R2	1	Chalk & Talk Tutorials
		3.10	The sum and number of divisors	T1, T2, R1, R2	1	Chalk & Talk
		3.11	Perfect numbers and Mersenne primes	T1, T2, R1, R2	1	Chalk & Talk PPT
		3.12	Perfect numbers and Mersenne primes	T1, T2, R1, R2	1	Chalk & Talk Tutorials
	ASSIGNMENT-II EXAMINATION					
4	CO-4: Make use of finite fields and primality (K3).		**UNIT–IV: Finite fields & Primality, factoring**			
		4.1	Finite fields	T1, T2, R1	1	Chalk & Talk, PPT.
		4.2	Finite fields	T1, T2, R1	1	Chalk & Talk
		4.3	quadratic residues and reciprocity	T1, T2, R1	1	Chalk & Talk Students Seminars
		4.4	quadratic residues and reciprocity	T1, T2, R1	1	Chalk & Talk, Tutorials
		4.5	quadratic residues and reciprocity	T1, T2, R1	1	Chalk & Talk, Tutorials
		4.6	Pseudo primes	T1, T2, R1, R3	1	Chalk & Talk
		4.7	Pseudo primes	T1, T2, R1, R2	1	Chalk & Talk
		4.8	rho method	T1, T2, R1, R3	1	Chalk & Talk PPT
		4.9	rho method	T1, T2, R1, R3	1	Chalk & Talk PPT

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		4.10	Fermat factorization and factor bases	T1, T2, R1, R2	1	Chalk & Talk NPTEL
		4.11	Fermat factorization and factor bases	T1, T2, R1, R2	1	Chalk & Talk
		4.12	Fermat factorization and factor bases	T1, T2, R1, R2	1	Chalk & Talk PPT
		UNIT – V: Cryptology				
5	CO-5: Develop various encryption methods and its applications (K3).	5.1	Basic terminology	T1, T2, R1	1	Chalk & Talk PPT
		5.2	complexity theorem	T1, T2, R1	1	Chalk & Talk, Tutorials
		5.3	Character ciphers	T1, T2, R1	1	Chalk & Talk
		5.4	Block ciphers	T1, T2, R1	1	Chalk & Talk
		5.5	Exponentiation ciphers	T1, T2, R1	1	Chalk & Talk
		5.6	Exponentiation ciphers	T1, T2, R1, R3	1	Chalk & Talk PPT
		5.7	Public-key cryptography	T1, T2, R1, R3	1	Chalk & Talk
		5.8	Public-key cryptography	T1, T2, R1, R3	1	Chalk & Talk Student Seminars
		5.9	Discrete logarithm	T1, T2, R1, R2	1	Chalk & Talk Student Seminars
		5.10	Knapsack ciphers	T1, T2, R1, R2	1	Chalk & Talk PPT
		5.11	RSA algorithm	T1, T2, R1, R3	1	Chalk & Talk
		5.12	RSA algorithm	T1, T2, R1, R3	1	Chalk & Talk
MID-II EXAMINATION						
TOTAL:60						

Text Books:

1. Elementary number theory and its applications, Kenneth H Rosen, AT & T Information systems & Bell laboratories.
2. A course in Number theory & Cryptography, Neal Koblitz, Springer.

Refrences:

1. An Introduction to the theory of numbers, Herbert S.Zukerman, Hugh L. Montgomery, Ivan Niven, wiley publishers.
2. Introduction to Analytic number theory, Tom M Apostol, Springer.
3. Elementary number theory, VK Krishnan, University press.

WEB SOURCE REFERENCES:

1	https://archive.nptel.ac.in/courses/111/101/111101137/
2	https://onlinecourses.nptel.ac.in/noc23_ma72/preview
3	https://archive.nptel.ac.in/courses/111/103/111103020/
4	https://onlinecourses.nptel.ac.in/noc22_cs90/preview
5	https://archive.nptel.ac.in/courses/106/105/106105162/

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DEPARTMENT OF CSE (CYBER SECURITY)
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	CREDITS	Contact Periods/Week	Section
R23CC2201	MEFA (R23)	II-II	CSE (CS)	2	4	A

L-T-P

COURSE OUTCOMES:

CO 1: Define the concepts related to Managerial Economics, financial accounting and management (L2)
CO 2: Understand the fundamentals of Economics viz., Demand, Production, cost, revenue and markets (L2)
CO 3: Apply the Concept of Production cost and revenues for effective Business decision (L3)
CO 4: Analyze how to invest their capital and maximize returns (L4)
CO 5: Evaluate the capital budgeting techniques. (L5)
CO 6: Develop the accounting statements and evaluate the financial performance of business entity (L5)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT-1 – Managerial Economics			
1	CO-1:Define the concepts related to Managerial Economics, financial accounting and management (L2)	1.1	Meaning & Nature of ME	T2, R2	2	Chalk & Talk
		1.2	significance, functions of ME	T2, R2	2	Chalk & Talk,PPT
		1.3	Advantages of ME	T2, R2	1	Chalk & Talk
		1.4	Demand-Concept, Function	T2, R2	1	Tutorial
		1.5	Law of Demand	T2, R2	1	Chalk & Talk,PPT
		1.6	Demand Elasticity- Types	T2, R2	2	Chalk & Talk,PPT
		1.7	Demand Measurement	T2, R2	1	Tutorial
		1.8	Demand Forecasting Factors governing Forecasting,	T2, R2	1	Chalk & Talk,PPT
		1.9	Demand Forecasting Methods	T2, R2	1	Web Resourses
		1.10	Managerial Economics and Financial Accounting and Management	T2, R2	1	Tutorial
			UNIT-2 - Production and Cost Analysis			
2	CO 2: Understand the fundamentals of Economics viz., Demand, Production,	2.1	Introduction – Nature	T2, R2	1	Chalk & Talk,PPT
		2.2	meaning, significance	T2, R2	1	Chalk & Talk
		2.3	functions and advantages	T2, R2	2	Chalk & Talk,PPT

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	cost, revenue and markets (L2)	2.4	Production Function	T2, R2	1	
		2.5	Least- cost combination	T2, R2	1	Chalk & Talk,PPT
		2.6	Short run Production Function	T2, R2	1	Chalk & Talk,PPT
		2.7	long run Production Function	T2, R2	1	Tutorial
		2.8	Isoquants and Isocosts	T2, R2	1	Web Resourses
		2.9	Cost & Break-Even Analysis	T2, R2	1	Chalk & Talk,PPT
		2.10	Cost concepts and Cost behaviour	T2, R2	1	Tutorial
		2.11	Break-Even Analysis (BEA)	T2, R2	1	Chalk & Talk,PPT
		2.12	Determination of Break-Even Point (Simple Problems).	T2, R2	3	Chalk & Talk,PPT
3	CO-3:Apply the Concept of Production cost and revenues for effective Business decision (L3)		**UNIT-3 - Business Organizations and Markets**			
		3.1	Introduction – Forms of Business Organizations	T2,R2	1	Chalk & Talk
		3.2	Sole Proprietary	T2,R2	1	Chalk & Talk,PPT
		3.3	Partnership	T2,R2	1	Chalk & Talk,PPT
		3.4	Joint Stock Companies	T2,R2	1	Tutorial
		3.5	Public Sector Enterprises	T2,R2	1	Web Resourses
			MID I EXAMINATION			
		3.6	Types of Markets	T2,R2	1	Chalk & Talk,PPT
		3.7	Perfect and Imperfect Competition	T2,R2	1	Chalk & Talk,PPT
		3.8	Features of Perfect Competition Monopoly-	T2,R2	1	Chalk & Talk,PPT
		3.9	Monopolistic Competition	T2,R2	1	Web Resourses
		3.10	Oligopoly-Price-Output Determination	T2,R2	1	Tutorial
		3.11	Pricing Methods and Strategies	T2,R2	2	Chalk & Talk,PPT
4	CO 4: Analyze how to invest their capital and maximize returns (L4) CO-5: Evaluate the capital budgeting techniques. (L5)		**UNIT-4 - Capital Budgeting**			
		4.1	Introduction – Nature,	T2,R2	1	Chalk & Talk
		4.2	meaning, significance	T2,R2	1	Chalk & Talk,PPT
		4.3	Types of Working Capital, Components	T2,R2	2	Web Resourses
		4.4	Sources of Short-term and Long-term Capital,	T2,R2	1	Tutorial
		4.5	Estimating Working capital	T2,R2	1	Chalk & Talk

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			requirements.			Talk,PPT
		4.6	Capital Budgeting-- Features, Proposals	T2,R2	1	Chalk & Talk,PPT
		4.7	Methods and Evaluation	T2,R2	1	Tutorial
		4.8	Projects- Pay back Method, Accounting Rate of Return (ARR)	T2,R2	3	Chalk & Talk,PPT
		4.9	Net Present Value (NPV) Internal Rate Return (IRR) Method (sample problems)	T2,R2	3	Chalk & Talk,PPT
		UNIT-5 - Financial Accounting and Analysis				
5	CO 6: Develop the accounting statements and evaluate the financial performance of business entity (L5)	5.1	Introduction – Concepts and Conventions	T2,R2	2	Chalk & Talk,PPT
		5.2	Double-Entry Bookkeeping	T2,R2	1	Chalk & Talk
		5.3	Journal	T2,R2	3	Chalk & Talk,PPT
		5.4	Ledger	T2,R2	2	Tutorial
		5.5	Trial Balance	T2,R2	2	Chalk & Talk,PPT
		5.6	Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).	T2,R2	4	Web Resourses
		5.7	Introduction to Financial Analysis	T2,R2	1	Tutorial
		5.8	Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability.	T2,R2	4	Chalk & Talk,PPT
				Total	73	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Textbooks:-

1. Varshney & Maheswari: Managerial Economics, Sultan Chand.

2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

Reference Books:-

1. Ahuja Hl Managerial economics Schand.

2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International.

3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi.

4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage.

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DEPARTMENT OF AIML
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2207	DIGITAL LOGIC & COMPUTER ORGANIZATION	I	AIML	5	A

After completion of this course the student should be able to

CO	Course Outcome Statement	
CO1	Analyze the data representation and digital logic circuits.	[K4]
CO2	Analyze the basic structure of computers.	[K4]
CO3	Analyze the computer arithmetic algorithms	[K4]
CO4	Analyze the processor, memory and input-output organizations.	[K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1: Analyze the data representation and digital logic circuits. [K4]		**Unit-1. Data Representation**			
		1.1	Number system	T1,T2, R2	2	Chalk & Talk
		1.2	Fixed point Representation	T1, T2, R2	1	Chalk & Talk
		1.3	Floating Point Representation	T1, T2, R2	2	Chalk & Talk
		1.4	Number base conversions	T1, T2, R2	2	Chalk & Talk
		1.5	Octal and Hexa decimal Numbers	T1, T2, R1	2	Chalk & Talk PPT
		1.6	components	T1, T2, R1	1	Chalk & Talk
		1.7	Signed binary numbers, Binary codes.	T1, T2, R1	2	Chalk & Talk
		1.8	**Digital Logic Circuits-I** Basic Logic Functions, Logic gates	T1, T2, R1	2	Chalk & Talk
		1.9	universal logic gates	T1, T2, R1	1	Chalk & Talk
		1.10	K-Map Simplification	T1, T2, R1	3	Chalk & Talk
		1.11	Combinational Circuits	T1, T2, R1	2	Chalk & Talk
		1.12	Decoders, Multiplexers.	T1, T2, R1	2	Chalk & Talk
	ASSIGNMENT I- EXAMINATION					
2	CO2: Analyze the basic structure of computers. [K4]		**Unit-2. Digital Logic Circuits-II**			
		2.1	Sequential Circuits	T1, T2,R1	1	Chalk & Talk
		2.2	Flip Flops, Binary counters	T1, T2,R1	2	Chalk & Talk
		2.3	Registers, Shift Registers	T1, T2,R1	2	Chalk & Talk
		2.4	Ripple counters.	T1, T2,R1	1	Chalk & Talk PPT
		2.5	Basic Structure of Computers Computer Types, Functional units	T1, T2,R1	2	Chalk & Talk PPT
		2.6	Basic operational concepts, Bus structures,	T1, T2,R1	2	Chalk & Talk PPT
		2.7	Software, Performance, multiprocessors and multi computers	T1, T2,R1	2	Chalk & Talk PPT

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		2.8	Computer Generations, Von-Neumann Architecture.	T1, T2,R1	1	Chalk & Talk PPT
MID-I EXAMINATION						
3	CO3: Analyze the computer arithmetic algorithms [K4]	**Unit-3. Computer Arithmetic**				
		3.1	Addition and Subtraction of Signed Numbers	T1, T2, R2	1	Chalk & Talk
		3.2	Design of Fast Adders, Multiplication of Positive Numbers	T1, T2, R2	2	Chalk & Talk PPT
		3.3	Signed-oper and Multiplication, Fast Multiplication,	T1, T2, R2	2	Chalk & Talk PPT
		3.4	integer Division, Floating-Point Numbers and Operations	T1, T2, R2	2	Chalk & Talk
		3.5	Processor Organization Fundamental Concepts	T1, T2, R2	2	Chalk & Talk
		3.6	Execution of a Complete Instruction, Multiple-Bus Organization	T1, T2, R2	3	Chalk & Talk
		3.7	Hardwired Control and Multiprogrammed Control.	T1, T2, R2	1	Chalk & Talk
ASSIGNMENT II EXAMINATION						
4	CO4: Analyze the processor, memory and input-output organizations. [K4]	**Unit 4 : The Memory Organization**				
		4.1	Basic Concepts, Semiconductor RAM Memories, Read-Only Memories,	T1, T3,R3	3	Chalk & Talk
		4.2	Speed, Size and Cost, Cache Memories	T1, T3,R3	1	Chalk & Talk
		4.3	Performance Considerations, Virtual Memories,,	T1, T3,R3	2	Chalk & Talk
		4.4	Memory Management Requirements, Secondary Stora	T1, T3,R3	2	Chalk & Talk
5	CO4: Analyze the processor, memory and input-output organizations. [K4]	**Unit 5. Input/Output Organization**				
		5.1	Accessing I/O Devices	T3, R2	2	Chalk & Talk
		5.2	Interrupts, Processor Examples	T3, R2	2	PPT
		5.3	Direct Memory Access	T3, R2	1	Chalk & Talk
		5.4	Buses, Interface Circuits	T3, R2	1	Chalk & Talk
		5.5	Standard I/O Interfaces.	T3, R2	2	Chalk & Talk
TOTAL: 64						
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

1. Computer Organization, Carl Hamacher, Zvonko Vranesic, SafwatZaky,6th edition, McGrawHill
2. Digital Design, 6thEdition, M.Morris Mano, Pearson Education.
3. Organization and Architecture,William Stallings, 11thEdition, Pearson.

Reference Books:

1. Computer Systems Architecture, M.Moris Mano, 3rdEdition, Pearson
2. Computer Organization and Design,David A.Paterson, JohnL. Hennessy, Elsevier
3. Fundamentals of Logic Design, Roth, 5thEdition, Thomson

ONLINE LEARNING RESOURCES:

https://nptel.ac.in/courses/106/103/106103068/

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DEPARTMENT OF CSE (AIML)
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2207	DIGITAL LOGIC & COMPUTER ORGANIZATION	I	CSE (AIML)	5	A,B

After completion of this course the student should be able to

CO	Course Outcome Statement	
CO1	Analyze the data representation and digital logic circuits.	[K4]
CO2	Analyze the basic structure of computers.	[K4]
CO3	Analyze the computer arithmetic algorithms	[K4]
CO4	Analyze the processor, memory and input-output organizations.	[K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1: Analyze the data representation and digital logic circuits. [K4]		**Unit-1. Data Representation**			
		1.1	Number system	T1,T2, R2	2	Chalk & Talk
		1.2	Fixed point Representation	T1, T2, R2	1	Chalk & Talk
		1.3	Floating Point Representation	T1, T2, R2	2	Chalk & Talk
		1.4	Number base conversions	T1, T2, R2	2	Chalk & Talk
		1.5	Octal and Hexa decimal Numbers	T1, T2, R1	2	Chalk & Talk PPT
		1.6	components	T1, T2, R1	1	Chalk & Talk
		1.7	Signed binary numbers, Binary codes.	T1, T2, R1	2	Chalk & Talk
		1.8	**Digital Logic Circuits-I** Basic Logic Functions, Logic gates	T1, T2, R1	2	Chalk & Talk
		1.9	universal logic gates	T1, T2, R1	1	Chalk & Talk
		1.10	K-Map Simplification	T1, T2, R1	3	Chalk & Talk
		1.11	Combinational Circuits	T1, T2, R1	2	Chalk & Talk
		1.12	Decoders, Multiplexers.	T1, T2, R1	2	Chalk & Talk
ASSIGNMENT I- EXAMINATION						
2	CO2: Analyze the basic structure of computers. [K4]		**Unit-2. Digital Logic Circuits-II**			
		2.1	Sequential Circuits	T1, T2,R1	1	Chalk & Talk
		2.2	Flip Flops, Binary counters	T1, T2,R1	2	Chalk & Talk
		2.3	Registers, Shift Registers	T1, T2,R1	2	Chalk & Talk
		2.4	Ripple counters.	T1, T2,R1	1	Chalk & Talk PPT
		2.5	Basic Structure of Computers Computer Types, Functional units	T1, T2,R1	2	Chalk & Talk PPT
		2.6	Basic operational concepts, Bus structures,	T1, T2,R1	2	Chalk & Talk PPT
		2.7	Software, Performance, multiprocessors and multi computers	T1, T2,R1	2	Chalk & Talk PPT

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		2.8	Computer Generations, Von-Neumann Architecture.	T1, T2,R1	1	Chalk & Talk PPT
MID-I EXAMINATION						
3	CO3: Analyze the computer arithmetic algorithms [K4]	**Unit-3. Computer Arithmetic**				
		3.1	Addition and Subtraction of Signed Numbers	T1, T2, R2	1	Chalk & Talk
		3.2	Design of Fast Adders, Multiplication of Positive Numbers	T1, T2, R2	2	Chalk & Talk PPT
		3.3	Signed-oper and Multiplication, Fast Multiplication,	T1, T2, R2	2	Chalk & Talk PPT
		3.4	integer Division, Floating-Point Numbers and Operations	T1, T2, R2	2	Chalk & Talk
		3.5	Processor Organization Fundamental Concepts	T1, T2, R2	2	Chalk & Talk
		3.6	Execution of a Complete Instruction, Multiple-Bus Organization	T1, T2, R2	3	Chalk & Talk
		3.7	Hardwired Control and Multiprogrammed Control.	T1, T2, R2	1	Chalk & Talk
ASSIGNMENT II EXAMINATION						
4	CO4: Analyze the processor, memory and input-output organizations. [K4]	**Unit 4 : The Memory Organization**				
		4.1	Basic Concepts, Semiconductor RAM Memories, Read-Only Memories,	T1, T3,R3	3	Chalk & Talk
		4.2	Speed, Size and Cost, Cache Memories	T1, T3,R3	1	Chalk & Talk
		4.3	Performance Considerations, Virtual Memories,,	T1, T3,R3	2	Chalk & Talk
		4.4	Memory Management Requirements, Secondary Stora	T1, T3,R3	2	Chalk & Talk
5	CO4: Analyze the processor, memory and input-output organizations. [K4]	**Unit 5. Input/Output Organization**				
		5.1	Accessing I/O Devices	T3, R2	2	Chalk & Talk
		5.2	Interrupts, Processor Examples	T3, R2	2	PPT
		5.3	Direct Memory Access	T3, R2	1	Chalk & Talk
		5.4	Buses, Interface Circuits	T3, R2	1	Chalk & Talk
		5.5	Standard I/O Interfaces.	T3, R2	2	Chalk & Talk
TOTAL: 64						
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

1. Computer Organization, Carl Hamacher, Zvonko Vranesic, SafwatZaky,6th edition, McGrawHill
2. Digital Design, 6thEdition, M.Morris Mano, Pearson Education.
3. Organization and Architecture,William Stallings, 11thEdition, Pearson.

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3. Fundamentals of Logic Design, Roth, 5thEdition, Thomson

ONLINE LEARNING RESOURCES:

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2208	OPTIMIZATION TECHNIQUES	IV	CSE(DS)	4	-

COURSE OUTCOMES: Students are able to

SNO	Course Outcome Statement
CO1	**Formulate** the optimization problem, without and with constraints, by using design variables from an engineering design problem **(K6)**
CO2	**Apply** classical optimization techniques to minimize or maximize a multi-variable Objective function, without or with constraints, and arrive at an optimal solution. **(K3)**
CO3	**Apply** and Solve transportation and assignment problem by using Linear programming Simplex method. **(K3)**
CO4	**Apply** gradient and non-gradient methods to nonlinear optimization problems and use Interior or exterior penalty functions for the constraints to derive the optimal solutions. **(K3)**
CO5	**Formulate** Dynamic programming technique to inventory control, production planning, Engineering design problems etc. to reach a final optimal solution from the current optimal solution. **(K6)**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: **Formulate** the optimization problem, without and with constraints, by using design variables from an engineering design problem (K6)		**UNIT– I**			
		1.1	Statement of an Optimization problem	T1, T2, R1	2	Chalk, Talk & PPT
		1.2	design vector, design constraints, constraint surface	T1, T2, R1	2	Chalk & Talk
		1.3	objective function, objective function surfaces, classification of Optimization problems	T1, T2, R1	2	Chalk & Talk
		1.4	Single variable Optimization, multivariable Optimization without constraints	T1, R1	2	Chalk & Talk
		1.5	necessary and sufficient conditions for minimum/maximum,multivariable Optimization with equality constraints	T1, T2, R1	2	Chalk & Talk
		1.6	Solution by method of Lagrange multipliers, multivariable Optimization with inequality constraints, Kuhn – Tucker conditions	T1, T2, R1	2	Chalk & Talk
2	CO2: **Apply** classical optimization techniques to minimize or maximize a multi-variable Objective function, without or with constraints, and arrive at an optimal solution. (K3)		**UNIT-II**			
		2.1	Standard form of a linear programming problem, geometry of linear programming problems	T1, R1	2	Chalk & Talk
		2.2	geometry of linear programming problems, definitions and theorems,	T1, R1	2	Chalk & Talk
		2.3	solution of a system of linear simultaneous equations, pivotal reduction of a general system of equations,	T1, R1	4	Chalk & Talk
		2.4	Motivation to the simplex method, simplex algorithm.	T1, T2, R2	4	Chalk & Talk
			MID I EXAMINATION			

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3	CO3 Apply and Solve transportation and assignment problem by using Linear programming Simplex method. (K3)	**UNIT-III**				
		3.1	Finding initial basic feasible solution by north – west corner rule	T1,R2	2	Chalk, Talk
		3.2	least cost method and Vogel's approximation method	T1,R2	2	Chalk, Talk
		3.3	testing for optimality of balanced transportation problems	T1,R2	4	Chalk & Talk
		3.4	Special cases in transportation problem.	T1, R2	4	Chalk & Talk
4	CO4 Apply gradient and non-gradient methods to nonlinear optimization problems and use Interior or exterior penalty functions for the constraints to derive the optimal solutions. (K3)	**UNIT-IV**				
		4.1	Unconstrained cases, One – dimensional minimization methods:	T1, T2,R2	2	Chalk & Talk
		4.2	Classification, Fibonacci method, Univariate method, steepest descent method. Constrained cases	T1, T2,R2	4	Chalk & Talk
		4.3	Characteristics of a constrained problem,	T1, R2	2	Chalk & Talk
		4.4	Classification, Basic approach of Penalty Function method,	T1, R2	2	Chalk & Talk
		4.5	Basic approaches of Interior and Exterior penalty function methods	T1, R2	2	Chalk & Talk
5	CO5 Formulate Dynamic programming technique to inventory control, production planning, Engineering design problems etc. to reach a final optimal solution from the current optimal solution. (K6)	**UNIT V**				
		5.1	Dynamic programming multistage decision processes, types	T1, R3	2	Chalk & Talk
		5.2	concept of sub optimization and the principle of optimality	T1, R3	2	Chalk & Talk
		5.3	computational procedure in dynamic programming	T1, R3	2	Chalk & Talk
		5.4	Examples illustrating the calculus method of solution	T1, R3	4	Chalk & Talk
		5.5	Examples illustrating the tabular method of solution.	T1, R3	2	Chalk & Talk
TOTAL					**60**	
MID II EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Engineering optimization: Theory and practice", Singiresu. S.Rao, New Age International (P) Limited, 3rd enlarged edition, 2013
T2	"Introductory Operations Research", H.S. Kasene& K.D. Kumar, Springer (India), Pvt.LTd.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	"Optimization Methods in Operations Research and systems Analysis", by K.V. Mital and C. Mohan, New Age International (P) Limited, Publishers, 3rd edition, 1996.
R2	Operations Research, Dr.S.D.Sharma, Kedarnath, Ramnath& Co.

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DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2208	OPTIMIZATION TECHNIQUES	IV	CSE(AI&ML)	4	A & B

COURSE OUTCOMES: Students are able to

SNO	Course Outcome Statement
CO1	**Formulate** the optimization problem, without and with constraints, by using design variables from an engineering design problem **(K6)**
CO2	**Apply** classical optimization techniques to minimize or maximize a multi-variable Objective function, without or with constraints, and arrive at an optimal solution. **(K3)**
CO3	**Apply** and Solve transportation and assignment problem by using Linear programming Simplex method. **(K3)**
CO4	**Apply** gradient and non-gradient methods to nonlinear optimization problems and use Interior or exterior penalty functions for the constraints to derive the optimal solutions. **(K3)**
CO5	**Formulate** Dynamic programming technique to inventory control, production planning, Engineering design problems etc. to reach a final optimal solution from the current optimal solution. **(K6)**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT– I			
1	**CO1: Formulate** the optimization problem, without and with constraints, by using design variables from an engineering design problem (K6)	1.1	Statement of an Optimization problem	T1, T2, R1	2	Chalk, Talk & PPT
		1.2	design vector, design constraints, constraint surface	T1, T2, R1	2	Chalk & Talk
		1.3	objective function, objective function surfaces, classification of Optimization problems	T1, T2, R1	2	Chalk & Talk
		1.4	Single variable Optimization, multivariable Optimization without constraints	T1, R1	2	Chalk & Talk
		1.5	necessary and sufficient conditions for minimum/maximum,multivariable Optimization with equality constraints	T1, T2, R1	2	Chalk & Talk
		1.6	Solution by method of Lagrange multipliers, multivariable Optimization with inequality constraints, Kuhn – Tucker conditions	T1, T2, R1	2	Chalk & Talk
			UNIT-II			
2	**CO2: Apply** classical optimization techniques to minimize or maximize a multi-variable Objective function, without or with constraints, and arrive at an optimal solution. (K3)	2.1	Standard form of a linear programming problem, geometry of linear programming problems	T1, R1	2	Chalk & Talk
		2.2	geometry of linear programming problems, definitions and theorems,	T1, R1	2	Chalk & Talk
		2.3	solution of a system of linear simultaneous equations, pivotal reduction of a general system of equations,	T1, R1	4	Chalk & Talk
		2.4	Motivation to the simplex method, simplex algorithm.	T1, T2, R2	4	Chalk & Talk
			MID I EXAMINATION			

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3	CO3 Apply and Solve transportation and assignment problem by using Linear programming Simplex method. (K3)		**UNIT-III**			
		3.1	Finding initial basic feasible solution by north – west corner rule	T1,R2	2	Chalk, Talk
		3.2	least cost method and Vogel's approximation method	T1,R2	2	Chalk, Talk
		3.3	testing for optimality of balanced transportation problems	T1,R2	4	Chalk & Talk
		3.4	Special cases in transportation problem.	T1, R2	4	Chalk & Talk
4	CO4 Apply gradient and non-gradient methods to nonlinear optimization problems and use Interior or exterior penalty functions for the constraints to derive the optimal solutions. (K3)		**UNIT-IV**			
		4.1	Unconstrained cases, One – dimensional minimization methods:	T1, T2,R2	2	Chalk & Talk
		4.2	Classification, Fibonacci method, Univariate method, steepest descent method. Constrained cases	T1, T2,R2	4	Chalk & Talk
		4.3	Characteristics of a constrained problem,	T1, R2	2	Chalk & Talk
		4.4	Classification, Basic approach of Penalty Function method,	T1, R2	2	Chalk & Talk
		4.5	Basic approaches of Interior and Exterior penalty function methods	T1, R2	2	Chalk & Talk
5	CO5 Formulate Dynamic programming technique to inventory control, production planning, Engineering design problems etc. to reach a final optimal solution from the current optimal solution. (K6)		**UNIT V**			
		5.1	Dynamic programming multistage decision processes, types	T1, R3	2	Chalk & Talk
		5.2	concept of sub optimization and the principle of optimality	T1, R3	2	Chalk & Talk
		5.3	computational procedure in dynamic programming	T1, R3	2	Chalk & Talk
		5.4	Examples illustrating the calculus method of solution	T1, R3	4	Chalk & Talk
		5.5	Examples illustrating the tabular method of solution.	T1, R3	2	Chalk & Talk
TOTAL					**60**	
MID II EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS

T	BOOK TITLE/AUTHORS/PUBLISHER
T1	Engineering optimization: Theory and practice", Singiresu. S.Rao, New Age International (P) Limited, 3rd enlarged edition, 2013
T2	"Introductory Operations Research", H.S. Kasene& K.D. Kumar, Springer (India), Pvt.LTd.

REFERENCE BOOKS

R	BOOK TITLE/AUTHORS/PUBLISHER
R1	"Optimization Methods in Operations Research and systems Analysis", by K.V. Mital and C. Mohan, New Age International (P) Limited, Publishers, 3rd edition, 1996.
R2	Operations Research, Dr.S.D.Sharma, Kedarnath, Ramnath& Co.

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Narasaraopeta Engineering College
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Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2208	OPTIMIZATION TECHNIQUES	IV	AI&ML	4	-

COURSE OUTCOMES: Students are able to

SNO	Course Outcome Statement
CO1	**Formulate** the optimization problem, without and with constraints, by using design variables from an engineering design problem **(K6)**
CO2	**Apply** classical optimization techniques to minimize or maximize a multi-variable Objective function, without or with constraints, and arrive at an optimal solution. **(K3)**
CO3	**Apply** and Solve transportation and assignment problem by using Linear programming Simplex method. **(K3)**
CO4	**Apply** gradient and non-gradient methods to nonlinear optimization problems and use Interior or exterior penalty functions for the constraints to derive the optimal solutions. **(K3)**
CO5	**Formulate** Dynamic programming technique to inventory control, production planning, Engineering design problems etc. to reach a final optimal solution from the current optimal solution. **(K6)**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: **Formulate** the optimization problem, without and with constraints, by using design variables from an engineering design problem (K6)		**UNIT– I**			
		1.1	Statement of an Optimization problem	T1, T2, R1	2	Chalk, Talk & PPT
		1.2	design vector, design constraints, constraint surface	T1, T2, R1	2	Chalk & Talk
		1.3	objective function, objective function surfaces, classification of Optimization problems	T1, T2, R1	2	Chalk & Talk
		1.4	Single variable Optimization, multivariable Optimization without constraints	T1, R1	2	Chalk & Talk
		1.5	necessary and sufficient conditions for minimum/maximum,multivariable Optimization with equality constraints	T1, T2, R1	2	Chalk & Talk
		1.6	Solution by method of Lagrange multipliers, multivariable Optimization with inequality constraints, Kuhn – Tucker conditions	T1, T2, R1	2	Chalk & Talk
2	CO2: **Apply** classical optimization techniques to minimize or maximize a multi-variable Objective function, without or with constraints, and arrive at an optimal solution. (K3)		**UNIT-II**			
		2.1	Standard form of a linear programming problem, geometry of linear programming problems	T1, R1	2	Chalk & Talk
		2.2	geometry of linear programming problems, definitions and theorems,	T1, R1	2	Chalk & Talk
		2.3	solution of a system of linear simultaneous equations, pivotal reduction of a general system of equations,	T1, R1	4	Chalk & Talk
		2.4	Motivation to the simplex method, simplex algorithm.	T1, T2, R2	4	Chalk & Talk
			MID I EXAMINATION			

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		5.7	Large sample test -Double proportion	T1, T2,R1	1	Chalk & Talk
		5.8	Small samples-Students t Test	T1, T2,R1	1	Chalk & Talk
		5.9	F-Test	T1, T2,R4	1	Chalk & Talk, web resources
		5.10	F-Test	T1, T2,R4	1	Chalk & Talk, web resources
		5.11	Chi Square Test	T1, T2,R1	1	Chalk & Talk Student seminar
		5.12	Chi Square Test	T1, T2,R1	1	Chalk & Talk
		MID-II EXAMINATION				
TOTAL:60						

Text Books:

1. Miller and Freund's, "Probability and Statistics for Engineers",7/e, Pearson, 2008.
2. S. C. Gupta and V.K. Kapoor, "Fundamentals of Mathematical Statistics", 11/e, Sultan Chand & Sons Publications, 2012.

References:

1.Shron L. Myers, Keying Ye, Ronald E Walpole, Probability and Statistics Engineers and the Scientists, 8th Edition, Pearson 2007.
2. Jay l. Devore, Probability and Statistics for Engineering and the Sciences, 8 th Edition, cengage.
3. Sheldon M. Ross, "Introduction to probability and statistics Engineers and the Scientists", 4 th Edition, Academic Foundation, 2011.
4. Johannes Ledolter and Robert V. Hogg, "Applied statistics for Engineers and Physical Scientists", 3 rd Edition, Pearson, 2010.

WEB SOURCE REFERENCES:

1	https://archive.nptel.ac.in/courses/111/105/111105090/
2	https://onlinecourses.nptel.ac.in/noc21_ma74/preview
3	https://archive.nptel.ac.in/courses/111/106/111106112/
4	https://archive.org/details/NPTEL-Math-Probability_and_Statistics
5	https://onlinecourses.nptel.ac.in/noc22_ma81/preview

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DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2201	Probability and Statistics	II-II	AIML	5	A

Course Outcomes:

After completion of this course, the students would be able to:

CO221.1	Classify the concept of data science and its importance	(K2)
CO221.2	Interpret the association of characteristics and through correlation and regression tools	(K4)
CO221.3	Apply discrete and continuous probability distributions	(K3)
CO221.4	Design the components of a classical hypothesis test	(K6)
CO221.5	Infer the statistical internal methods based on small and large sample tests	(K4)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT-I : Descriptive Statistics and methods for data science			
1	CO-1: Classify the concept of data science and its importance (K2).	1.1	Introduction to Data science	T1, T2, R1	1	Chalk & Talk PPT
		1.2	Population Vs sample, collection of Data	T1, T2, R1	1	Chalk & Talk
		1.3	Types of Variables	T1, T2, R1	1	Chalk & Talk
		1.4	Data Visualization charts	T1, T2, R2	1	Chalk & Talk
		1.5	Mean, median,, mode	T1, T2, R1	1	Chalk & Talk
		1.6	Geometric mean, Harmonic mean	T1, T2, R1	1	Chalk & Talk
		1.7	Range, variance,	T1, T2, R1	1	Chalk & Talk
		1.8	Mean & deviation	T1, T2, R1	1	Chalk & Talk
		1.9	Skewness	T1, T2, R1	1	Chalk & Talk
		1.10	Skewness	T1, T2, R1	1	Chalk & Talk Student seminar
		1.11	kurtosis	T1, T2, R1	1	Chalk & Talk
		1.12	kurtosis	T1, T2, R1	1	Chalk & Talk
			ASSIGNMENT-I EXAMINATION			
2	CO-2: Interpret the association of characteristics and through correlation and regression tools (K4).		**UNIT – II: CORRELATION AND CURVE FITTING**			
		2.1	Types of correlation	T1, T2,R1	1	Chalk & Talk PPT
		2.2	Coefficient of correlation	T1, T2,R1	1	Chalk & Talk,
		2.3	Rank correlation coefficient	T1, T2,R1	1	Chalk & Talk,
		2.4	Regression Coefficient and Regression Equation	T1, T2,R1	1	Chalk & Talk NPTEL
		2.5	Fitting a straight Line-Method of least squares	T1, T2,R1	1	Chalk & Talk
		2.6	Fitting a straight Line-Method of least squares	T1, T2,R1	1	Chalk & Talk
		2.7	Fitting a Parabola	T1, T2,R1	1	Chalk & Talk

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		2.8	Fitting a Parabola	T1, T2,R1	1	Chalk & Tk
		2.9	Fitting a Exponential curve	T1, T2,R2	1	Chalk & Talk,
		2.10	Fitting a Exponential curve	T1, T2,R2	1	Chalk & Talk,
		2.11	Fitting a Power Curve	T1, T2,R1	1	Chalk & Talk Student seminar
		2.12	Fitting a Power Curve	T1, T2,R1	1	Chalk & Talk
		MID-I EXAMINATION				
		UNIT-III :Probability Distributions				
3	CO-3: Apply discrete and continuous probability distributions (K3).	3.1	Introduction to Probability	T1, T2, R1	1	Chalk & Talk PPT
		3.2	Conditional Probability, baye's theorem	T1, T2, R1	1	Chalk & Talk
		3.3	Discrete Random Variables	T1, T2, R1	1	Chalk & Talk,
		3.4	Continuous Random variables	T1, T2, R3	1	Chalk & Talk,
		3.5	Distribution function	T1, T2, R1	1	Chalk & Talk
		3.6	Mathematical expectation	T1, T2, R1	1	Chalk & Talk,
		3.7	variance	T1, T2, R1	1	Chalk & Talk
		3.8	Binomial distribution	T1, T2, R3	1	Chalk & Talk Student seminar
		3.9	Poisson and uniform distribution	T1, T2, R1	1	Chalk & Talk
		3.10	Poisson and uniform distribution	T1, T2, R1	1	Chalk & Talk
		3.11	Normal Distribution	T1, T2, R1	1	Chalk & Talk
		3.12	Normal Distribution	T1, T2, R1	1	Chalk & Talk
		ASSIGNMENT-II EXAMINATION				
		UNIT-IV :SAMPLING THEORY				
4	CO-4: Design the components of a classical hypothesis test (K6).	4.1	Introduction Sampling Theory	T1, T2,R1	1	Chalk & Talk, PPT
		4.2	Population Vs sample	T1, T2,R1	1	Chalk & Talk
		4.3	Sampling distribution of means, variances	T1, T2,R1	1	Chalk & Talk
		4.4	Central Limit theorem	T1, T2,R1	1	Chalk & Talk
		4.5	Introduction to t distribution	T1, T2,R1	1	Chalk & Talk
		4.6	Introduction to F Distribution	T1, T2,R1	1	Chalk & Talk
		4.7	Introduction to F Distribution	T1, T2,R1	1	Chalk & Talk
		4.8	Introduction to Chi-Square Distributions	T1, T2,R2	1	Chalk & Talk
		4.9	Introduction to Chi-Square Distributions	T1, T2,R2	1	Chalk & Talk
		4.10	Point Estimation	T1, T2,R1	1	Chalk & Talk,
		4.11	Interval Estimation	T1, T2,R1	1	Chalk & Talk Student seminar
		4.12	Maximum error of estimate	T1, T2,R1	1	Chalk & Talk
		UNIT-V : TESTING OF HYPOTHESIS				
5	CO-5: Infer the statistical internal methods based on small and large sample tests (K4).	5.1	Introduction to Tests of Hypothesis	T1, T2, R1	1	Chalk & Talk, PPT
		5.2	Formulation of Null Hypothesis, critical region, level of significance	T1, T2,R1	1	Chalk & Talk
		5.3	One Tail, Two tailed Tests Type-I, and Type-II errors	T1, T2,R1	1	Chalk & Talk Tutorial
		5.4	Large sample test -single mean	T1, T2,R1	1	Chalk & Talk
		5.5	Large sample test -,two means	T1, T2,R1	1	Chalk & Talk
		5.6	Large sample test -single proportion	T1, T2,R1	1	Chalk & Talk

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DEPARTMENT OF CSE (AIML), CSE (CS), CSE (DS), AIML
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC22MC	ENVIRONMENTAL STUDIES (R23)	II- II	CSE (AIML)	2	A,B

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO:1 Understand multi-disciplinary nature of environmental studies and Analyze the natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources.(K2)	**Unit-1. Multidisciplinary nature of Environmental Studies**				
		1.1	Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.	T1, T2, R1	1	Chalk& Talk
		1.2	Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems	T1, T2, R1	1	Chalk& Talk
		1.3	Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction	T1, T2, R1	2	Active learning & PPT
		1.4	Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems	T1	2	PPT
		1.5	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.	T1, T2, R1	1	Active learning & PPT
2	CO2: Explain the concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web. Explain the biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity. (K2)	**Unit-2. Ecosystems**				
		2.1	Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession mining, dams and effects on forest and tribal people.	T1, T2, R3	2	Active learning & PPT
		2.2	Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:	T1, T2, R3	2	PPT & Case Study
		2.3	a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem	T1, T2, R3	1	Chalk& Talk
		2.4	d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) Biodiversity and Its Conservation : Introduction and Definition: genetic, species and ecosystem diversity.	T1, T2, R3	1	Chalk& Talk

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Chalk Chalk& Ta		5.6	Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.	T1, T2, R1	1	Chalk& Talk, Active Learning
				Total	**34**	

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Erach Bharucha,Textbook of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
T2	Palaniswamy, Environmental Studies, 2/e, Pearson education, 2014.
T3	S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.
T4	K.Raghavan Nambiar, "Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e,Cengage Publications, 2012.
R2	M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BSPublication, 2014.
R3	J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering,Prentice Hall of India Private limited, 1988.
R4	G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House,2018.
R5	Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineeringand Science, 1/e, Prentice Hall of India Private limited, 1991

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DEPARTMENT OF CSE (AIML), CSE (CS), CSE (DS), AIML
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC22MC	ENVIRONMENTAL STUDIES (R23)	II- II	CSE (CS)	2	A

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO:1 Understand multi-disciplinary nature of environmental studies and Analyze the natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources.(K2)	**Unit-1. Multidisciplinary nature of Environmental Studies**				
		1.1	Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.	T1, T2, R1	1	Chalk& Talk
		1.2	Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems	T1, T2, R1	1	Chalk& Talk
		1.3	Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction	T1, T2, R1	2	Active learning & PPT
		1.4	Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems	T1	2	PPT
		1.5	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.	T1, T2, R1	1	Active learning & PPT
2	CO2: Explain the concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web. Explain the biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity. (K2)	**Unit-2. Ecosystems**				
		2.1	Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession mining, dams and effects on forest and tribal people.	T1, T2, R3	2	Active learning & PPT
		2.2	Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:	T1, T2, R3	2	PPT & Case Study
		2.3	a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem	T1, T2, R3	1	Chalk& Talk
		2.4	d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) Biodiversity and Its Conservation : Introduction and Definition: genetic, species and ecosystem diversity.	T1, T2, R3	1	Chalk& Talk

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		2.5	Bio-geographical classification of India Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values	T1	1	Chalk&
		2.6	Biodiversity at global, National and local levels – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts	T1, T2, R1	1	Chalk& Tal,
3	CO3: Distinguish various attributes of the pollution, their impacts and measures to reduce or control the pollution along with waste management(K2)	**Unit-3. Environmental Pollution:**				
		3.1	Environmental Pollution: Definition, Cause, effects and control measures of: a. Air Pollution.	T1, T2, R1	1	Chalk& Talk
		3.2	Definition, Cause, effects and control measures of: b.Water pollution c.Soil pollution	T1, T2, R1	1	Chalk& Talk
		3.3	d.Marine pollution e.Noise pollution	T1, T2, R1	1	Active learning & PPT
		3.4	Solid Waste Management: Causes, effects and control measures of urban and industrial wastes	T1, T2, R1	1	PPT
		3.5	Role of an individual in prevention of pollution – Pollution case studies	T1, T2, R1	1	Tutorial
		3.6	Disaster management: floods, earthquake, cyclone and landslides.	T1, T2, R1	1	Tutorial & PPT
4	CO4: Understand the rainwater harvesting, watershed management, and ozone layer depletion and waste land reclamation. (K2))	**Unit-4.** Social Issues and the Environment:				
		4.1	Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershedmanagement	T1, T2, R3	2	Chalk& Talk, Industrial Visit
		4.2	Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies	T1, T2, R3	2	PPT
		4.3	Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act	T1, T2, R3	2	Chalk& Talk, Case Study
		4.4	Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.	T1, T2, R3	1	Tutorial, PPT
5	CO 5: Illustrate the causes of population explosion, value education and welfare programmes. (K3).	**Unit 5.** Human Population And The Environment:				
		5.1	Population growth, variation among nations. Population explosion	T1, T2, R3	1	PPT, Chalk& Talk
		5.2	Family Welfare Programmes. – Environment and human health	T1, T2, R3 T1	1	PPT Active learning & PPT
		5.3	Human Rights – Value Education – HIV/AIDS	T1, T2, R3	1	Case Study & PPT
		5.4	Women and Child Welfare	T1, T2, R1	1	Chalk& Talk
		5.5	Role of information Technology in Environment and human health – Case studies.	T1, T2, R1	1	Chalk& Talk

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3	CO3 Apply and Solve transportation and assignment problem by using Linear programming Simplex method. (K3)	UNIT-III				
		3.1	Finding initial basic feasible solution by north – west corner rule	T1,R2	2	Chalk, Talk
		3.2	least cost method and Vogel's approximation method	T1,R2	2	Chalk, Talk
		3.3	testing for optimality of balanced transportation problems	T1,R2	4	Chalk & Talk
		3.4	Special cases in transportation problem.	T1, R2	4	Chalk & Talk
4	CO4 Apply gradient and non-gradient methods to nonlinear optimization problems and use Interior or exterior penalty functions for the constraints to derive the optimal solutions. (K3)	UNIT-IV				
		4.1	Unconstrained cases, One – dimensional minimization methods:	T1, T2,R2	2	Chalk & Talk
		4.2	Classification, Fibonacci method, Univariate method, steepest descent method. Constrained cases	T1, T2,R2	4	Chalk & Talk
		4.3	Characteristics of a constrained problem,	T1, R2	2	Chalk & Talk
		4.4	Classification, Basic approach of Penalty Function method,	T1, R2	2	Chalk & Talk
		4.5	Basic approaches of Interior and Exterior penalty function methods	T1, R2	2	Chalk & Talk
5	CO5 Formulate Dynamic programming technique to inventory control, production planning, Engineering design problems etc. to reach a final optimal solution from the current optimal solution. (K6)	UNIT V				
		5.1	Dynamic programming multistage decision processes, types	T1, R3	2	Chalk & Talk
		5.2	concept of sub optimization and the principle of optimality	T1, R3	2	Chalk & Talk
		5.3	computational procedure in dynamic programming	T1, R3	2	Chalk & Talk
		5.4	Examples illustrating the calculus method of solution	T1, R3	4	Chalk & Talk
		5.5	Examples illustrating the tabular method of solution.	T1, R3	2	Chalk & Talk
TOTAL					60	
MID II EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS	
T	BOOK TITLE/AUTHORS/PUBLISHER
T1	Engineering optimization: Theory and practice", Singiresu. S.Rao, New Age International (P) Limited, 3rd enlarged edition, 2013
T2	"Introductory Operations Research", H.S. Kasene& K.D. Kumar, Springer (India), Pvt.LTd.
REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	"Optimization Methods in Operations Research and systems Analysis", by K.V. Mital and C. Mohan, New Age International (P) Limited, Publishers, 3rd edition, 1996.
R2	Operations Research, Dr.S.D.Sharma, Kedarnath, Ramnath& Co.

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Narasaraopeta Engineering College
(Autonomous)
Yellamanda(Post), Narasaraopet- 522601

DEPARTMENT OF CSE (AIML), CSE (CS), CSE (DS), AIML
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC22MC	ENVIRONMENTAL STUDIES (R23)	II- II	AIML	2	A

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO:1 Understand multi-disciplinary nature of environmental studies and Analyze the natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources.(K2)	**Unit-1. Multidisciplinary nature of Environmental Studies**				
		1.1	Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.	T1, T2, R1	1	Chalk& Talk
		1.2	Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems	T1, T2, R1	1	Chalk& Talk
		1.3	Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction	T1, T2, R1	2	Active learning & PPT
		1.4	Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems	T1	2	PPT
		1.5	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.	T1, T2, R1	1	Active learning & PPT
2	CO2: Explain the concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web. Explain the biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity. (K2)	**Unit-2. Ecosystems**				
		2.1	Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession mining, dams and effects on forest and tribal people.	T1, T2, R3	2	Active learning & PPT
		2.2	Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:	T1, T2, R3	2	PPT & Case Study
		2.3	a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem	T1, T2, R3	1	Chalk& Talk
		2.4	d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) Biodiversity and Its Conservation : Introduction and Definition; genetic, species and ecosystem diversity.	T1, T2, R3	1	Chalk& Talk

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5.6	Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.	T1, T2, R1	1	Chalk& Talk, Active Learning
		Total	**34**	

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Erach Bharucha,Textbook of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
T2	Palaniswamy, Environmental Studies, 2/e, Pearson education, 2014.
T3	S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.
T4	K.Raghavan Nambiar, "Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e,Cengage Publications, 2012.
R2	M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BSPublication, 2014.
R3	J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering,Prentice Hall of India Private limited, 1988.
R4	G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House,2018.
R5	Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineeringand Science, 1/e, Prentice Hall of India Private limited, 1991

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		2.5	Bio-geographical classification of India Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values	T1	1	Chalk&
		2.6	Biodiversity at global, National and local levels – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts	T1, T2, R1	1	Chalk& Tal
3	CO3: Distinguish various attributes of the pollution, their impacts and measures to reduce or control the pollution along with waste management(K2)	**Unit-3. Environmental Pollution:**				
		3.1	Environmental Pollution: Definition, Cause, effects and control measures of: a. Air Pollution.	T1, T2, R1	1	Chalk& Talk
		3.2	Definition, Cause, effects and control measures of: b.Water pollution c.Soil pollution	T1, T2, R1	1	Chalk& Talk
		3.3	d.Marine pollution e.Noise pollution	T1, T2, R1	1	Active learning & PPT
		3.4	Solid Waste Management: Causes, effects and control measures of urban and industrial wastes	T1, T2, R1	1	PPT
		3.5	Role of an individual in prevention of pollution – Pollution case studies	T1, T2, R1	1	Tutorial
		3.6	Disaster management: floods, earthquake, cyclone and landslides.	T1, T2, R1	1	Tutorial & PPT
4	CO4: Understand the rainwater harvesting, watershed management, and ozone layer depletion and waste land reclamation. (K2))	**Unit-4.** Social Issues and the Environment:				
		4.1	Social Issues and the Environment: From Unsustainable to Sustainable development = Urban problems related to energy – Water conservation, rain water harvesting, watershedmanagement	T1, T2, R3	2	Chalk& Talk, Industrial Visit
		4.2	Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies	T1, T2, R3	2	PPT
		4.3	Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act	T1, T2, R3	2	Chalk& Talk, Case Study
		4.4	Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.	T1, T2, R3	1	Tutorial, PPT
5	CO 5: Illustrate the causes of population explosion, value education and welfare programmes. (K3).	**Unit 5.** Human Population And The Environment:				
		5.1	Population growth, variation among nations. Population explosion	T1, T2, R3	1	PPT, Chalk& Talk
		5.2	Family Welfare Programmes. – Environment and human health	T1, T2, R3 T1	1	PPT Active learning & PPT
		5.3	Human Rights – Value Education – HIV/AIDS	T1, T2, R3	1	Case Study & PPT
		5.4	Women and Child Welfare	T1, T2, R1	1	Chalk& Talk
		5.5	Role of information Technology in Environment and human health – Case studies.	T1, T2, R1	1	Chalk& Talk

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		5.6	Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.	T1, T2, R1	1	Chalk& Talk, Active Learning
				Total	**34**	

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Erach Bharucha,Textbook of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
T2	Palaniswamy, Environmental Studies, 2/e, Pearson education, 2014.
T3	S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.
T4	K.Raghavan Nambiar, "Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e,Cengage Publications, 2012.
R2	M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BSPublication, 2014.
R3	J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering,Prentice Hall of India Private limited, 1988.
R4	G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House,2018.
R5	Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineeringand Science, 1/e, Prentice Hall of India Private limited, 1991

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DEPARTMENT OF CSE (AIML), CSE (CS), CSE (DS), AIML
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC22MC	ENVIRONMENTAL STUDIES (R23)	II- II	CSE (DS)	2	A

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO:1 Understand multi-disciplinary nature of environmental studies and Analyze the natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources.(K2)	**Unit-1. Multidisciplinary nature of Environmental Studies**				
		1.1	Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.	T1, T2, R1	1	Chalk& Talk
		1.2	Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems	T1, T2, R1	1	Chalk& Talk
		1.3	Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction	T1, T2, R1	2	Active learning & PPT
		1.4	Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems	T1	2	PPT
		1.5	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.	T1, T2, R1	1	Active learning & PPT
2	CO2: Explain the concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web. Explain the biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity. (K2)	**Unit-2. Ecosystems**				
		2.1	Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession mining, dams and effects on forest and tribal people.	T1, T2, R3	2	Active learning & PPT
		2.2	Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:	T1, T2, R3	2	PPT & Case Study
		2.3	a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem	T1, T2, R3	1	Chalk& Talk
		2.4	d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) Biodiversity and Its Conservation : Introduction and Definition: genetic, species and ecosystem diversity.	T1, T2, R3	1	Chalk& Talk

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		2.5	Bio-geographical classification of India Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values	T1	1	Chalk
		2.6	Biodiversity at global, National and local levels – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts	T1, T2, R1	1	Chalk& Talk
3	CO3: Distinguish various attributes of the pollution, their impacts and measures to reduce or control the pollution along with waste management(K2)	**Unit-3. Environmental Pollution:**				
		3.1	Environmental Pollution: Definition, Cause, effects and control measures of: a. Air Pollution.	T1, T2, R1	1	Chalk& Talk
		3.2	Definition, Cause, effects and control measures of: b.Water pollution c.Soil pollution	T1, T2, R1	1	Chalk& Talk
		3.3	d.Marine pollution e.Noise pollution	T1, T2, R1	1	Active learning & PPT
		3.4	Solid Waste Management: Causes, effects and control measures of urban and industrial wastes	T1, T2, R1	1	PPT
		3.5	Role of an individual in prevention of pollution – Pollution case studies	T1, T2, R1	1	Tutorial
		3.6	Disaster management: floods, earthquake, cyclone and landslides.	T1, T2, R1	1	Tutorial & PPT
4	CO4: Understand the rainwater harvesting, watershed management, and ozone layer depletion and waste land reclamation. (K2))	**Unit-4.** Social Issues and the Environment:				
		4.1	Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershedmanagement	T1, T2, R3	2	Chalk& Talk, Industrial Visit
		4.2	Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies	T1, T2, R3	2	PPT
		4.3	Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act	T1, T2, R3	2	Chalk& Talk, Case Study
		4.4	Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.	T1, T2, R3	1	Tutorial, PPT
5	CO 5: Illustrate the causes of population explosion, value education and welfare programmes. (K3).	**Unit 5.** Human Population And The Environment:				
		5.1	Population growth, variation among nations. Population explosion	T1, T2, R3	1	PPT, Chalk& Talk
		5.2	Family Welfare Programmes. – Environment and human health	T1, T2, R3 T1	1	PPT Active learning & PPT
		5.3	Human Rights – Value Education – HIV/AIDS	T1, T2, R3	1	Case Study & PPT
		5.4	Women and Child Welfare	T1, T2, R1	1	Chalk& Talk
		5.5	Role of information Technology in Environment and human health – Case studies.	T1, T2, R1	1	Chalk& Talk

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		5.6	Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.	T1, T2, R1	1	Chalk& Talk, Active Learning
				Total	34	

TEXT BOOKS	
T	BOOK TITLE/AUTHORS/PUBLISHER
T1	Erach Bharucha.Textbook of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
T2	Palaniswamy, Environmental Studies, 2/e. Pearson education, 2014.
T3	S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.
T4	K.Raghavan Nambiar, "Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e,Cengage Publications, 2012.
R2	M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BSPublication, 2014.
R3	J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering,Prentice Hall of India Private limited, 1988.
R4	G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House,2018.
R5	Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineeringand Science, 1/e, Prentice Hall of India Private limited, 1991

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		2.5	Bio-geographical classification of India Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values	T1	1	Chalk.
		2.6	Biodiversity at global, National and local levels – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts	T1, T2, R1	1	Chalk& Tal
3	CO3: Distinguish various attributes of the pollution, their impacts and measures to reduce or control the pollution along with waste management(K2)	**Unit-3. Environmental Pollution:**				
		3.1	Environmental Pollution: Definition, Cause, effects and control measures of: a. Air Pollution.	T1, T2, R1	1	Chalk& Talk
		3.2	Definition, Cause, effects and control measures of: b.Water pollution c.Soil pollution	T1, T2, R1	1	Chalk& Talk
		3.3	d.Marine pollution e.Noise pollution	T1, T2, R1	1	Active learning & PPT
		3.4	Solid Waste Management: Causes, effects and control measures of urban and industrial wastes	T1, T2, R1	1	PPT
		3.5	Role of an individual in prevention of pollution – Pollution case studies	T1, T2, R1	1	Tutorial
		3.6	Disaster management: floods, earthquake, cyclone and landslides.	T1, T2, R1	1	Tutorial & PPT
4	CO4: Understand the rainwater harvesting, watershed management, and ozone layer depletion and waste land reclamation. (K2))	**Unit-4.** Social Issues and the Environment:				
		4.1	Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershedmanagement	T1, T2, R3	2	Chalk& Talk, Industrial Visit
		4.2	Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies	T1, T2, R3	2	PPT
		4.3	Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act	T1, T2, R3	2	Chalk& Talk, Case Study
		4.4	Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.	T1, T2, R3	1	Tutorial, PPT
5	CO 5: Illustrate the causes of population explosion, value education and welfare programmes. (K3).	**Unit 5.** Human Population And The Environment:				
		5.1	Population growth, variation among nations. Population explosion	T1, T2, R3	1	PPT, Chalk& Talk
		5.2	Family Welfare Programmes. – Environment and human health	T1, T2, R3 T1	1	PPT Active learning & PPT
		5.3	Human Rights – Value Education – HIV/AIDS	T1, T2, R3	1	Case Study & PPT
		5.4	Women and Child Welfare	T1, T2, R1	1	Chalk& Talk
		5.5	Role of information Technology in Environment and human health – Case studies.	T1, T2, R1	1	Chalk& Talk

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DEPARTMENT OF CSE (AIML)
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R23CC2206	MACHINE LEARNING (R23)	II-II	CSE (AIML)	5	A,B

COURSE OUTCOMES:

After successful completion of this course, students will be able to:

CO1	Analyze and Design Intelligent Agents	[K4]
CO2	Apply Search Algorithms to Problem Solving	[K3]
CO3	Apply techniques for constraint propagation and reasoning under uncertainty	[K3]
CO4	Utilize inductive learning, decision trees, and explanation-based learning for learning from Observation.	[K3]
CO5	Analyze and compare typical expert systems such as MYCIN, DART, and XCON	[K4]

Unit No	Outcome		Topics/Activity	Ref./ Text Book	Hours	Delivery Method
1	CO1: Analyze and Design Intelligent Agents [K4]		**Unit-1: Introduction to Machine Learning:**			
		1.1	Evolution of Machine Learning	T1	2	Chalk & Talk
		1.2	Paradigms for ML, Learning by Rote	T1	2	Chalk & Talk
		1.3	Learning by Induction, Reinforcement Learning	T1	2	Chalk & Talk
		1.4	Types of Data, Matching	T1	2	Chalk & Talk
		1.5	Stages in Machine Learning	T1	2	Chalk & Talk
		1.6	Data Acquisition, Feature Engineering	T1	2	Chalk & Talk
		1.7	Data Representation	T1	1	Chalk & Talk
		1.8	Model Selection, Model Learning	T1	1	Chalk & Talk
		1.9	Model Evaluation, Model Prediction	T1	2	Chalk & Talk
		1.10	Search and Learning, Data Sets.	T1	2	Chalk & Talk
			FIRST ASSIGNMENT			
	CO2: Apply Search		**Unit-2: Nearest Neighbor-Based Models**			

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2	Algorithms to Problem Solving [K3]	2.1	Models: Introduction to Proximity Measures	T1	2	Chalk Talk
		2.2	Distance Measures, Non-Metric Similarity Functions,	T1	2	Chalk & Talk
		2.3	Proximity Between Binary Patterns,	T1	2	Chalk & Talk
		2.4	Different Classification Algorithms Based on the Distance Measures	T1	2	Chalk & Talk
		2.5	,K-Nearest Neighbor Classifier	T1	2	Chalk & Talk
		2.6	Radius Distance Nearest Neighbor Algorithm	T1	2	Chalk & Talk
		2.7	KNN Regression	T1	2	Chalk & Talk
		2.8	Performance of Classifiers,	T1	2	Chalk & Talk
		2.9	Performance of Regression Algorithms.	T1	2	Chalk & Talk
		MID I EXAMINATION				
3	CO 3: Apply techniques for constraint propagation and reasoning under uncertainty [K3]	**Unit-3: Models Based on Decision Trees:**				
		3.1	Decision Trees for Classification	T1	1	Chalk & Talk
		3.2	Impurity Measures, Properties	T1	2	Chalk & Talk
		3.3	Regression Based on Decision Trees	T1	2	Chalk & Talk
		3.4	Bias–Variance Trade-off	T1	2	Chalk & Talk
		3.5	Independence and Naive Bayes Classifier (NBC)	T1	2	Chalk & Talk
4	CO 4: Utilize inductive learning, decision trees, and explanation-based learning for learning from observation. [K3]	**SECOND ASSIGNMENT**				
		Unit-4: Linear Discriminants for Machine Learning:				
		4.1	Introduction to Linear Discriminants	T1	1	Chalk & Talk
		4.2	Linear Discriminants for Classification	T1	2	Chalk & Talk
		4.3	Perceptron Classifier	T1	2	Chalk & Talk
		4.4	Perceptron Learning Algorithm	T1	2	Chalk & Talk
		4.5	Support Vector Machines	T1	1	Chalk & Talk
		4.6	Linearly Non-Separable Case	T1	2	Chalk & Talk
		4.7	Non-linear SVM, Kernel Trick	T1	2	Chalk & Talk

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		4.8	Logistic Regression, Linear Regression	T1	2	Chalk & Talk
		4.9	Multi-Layer Perceptron's (MLPs)	T1	2	Chalk & Talk
		4.10	Backpropagation for Training an MLP	T1	2	Chalk & Talk
5	CO5: Analyze and compare typical expert systems such as MYCIN, DART, and XCON [K4]	**Unit-5: Clustering**				
		5.1	Introduction to Clustering	T1	1	Chalk & Talk
		5.2	Partitioning of Data	T1	2	Chalk & Talk
		5.3	Matrix Factorization	T1	1	Chalk & Talk
		5.4	Clustering of Patterns, Divisive Clustering	T1	2	Chalk & Talk
		5.5	Agglomerative Clustering, Partitional Clustering	T1	2	Chalk & Talk
		5.6	K-Means Clustering	T1	2	Chalk & Talk
		5.7	Soft Partitioning, Soft Clustering	T1	1	Chalk & Talk
		5.8	Fuzzy C-Means Clustering,	T1	2	Chalk & Talk
		5.9	Rough Clustering, Rough K-Means Clustering Algorithm	T1	2	Chalk & Talk
		5.10	Expectation Maximization-Based Clustering ,Spectral Clustering	T1	2	Chalk & Talk
					Total Number of Hours:79	
		MID II EXAMINATION				
		END EXAMINATIONS				

TEXT BOOKS	
1	"Machine Learning Theory and Practice", M N Murthy, V S Ananthanarayana, Universities Press (India), 2024
REFERENCE BOOKS	
1	"Machine Learning", Tom M. Mitchell, McGraw-Hill Publication, 2017
2	"Machine Learning in Action", Peter Harrington, DreamTech
3	"Introduction to Data Mining", Pang-Ning Tan, Michel Stenbach, Vipin Kumar, 7th Edition, 2019.
e-Resources:	
1	**https://www.universitiespress.com/MachineLearningTheoryandPractice**

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Narasaraopeta Engineering College
(Autonomous)
Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF AIML
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R23CC2206	MACHINE LEARNING (R23)	II-II	AIML	5	A

COURSE OUTCOMES: CR-3

After successful completion of this course, students will be able to:

CO1	Analyze and Design Intelligent Agents	[K4]
CO2	Apply Search Algorithms to Problem Solving	[K3]
CO3	Apply techniques for constraint propagation and reasoning under uncertainty	[K3]
CO4	Utilize inductive learning, decision trees, and explanation-based learning for learning from Observation.	[K3]
CO5	Analyze and compare typical expert systems such as MYCIN, DART, and XCON	[K4]

Unit No	Outcome		Topics/Activity	Ref./ Text Book	Hours	Delivery Method
1	CO1: Analyze and Design Intelligent Agents [K4]	**Unit-1: Introduction to Machine Learning:**				
		1.1	Evolution of Machine Learning	T1	2	Chalk & Talk
		1.2	Paradigms for ML, Learning by Rote	T1	2	Chalk & Talk
		1.3	Learning by Induction, Reinforcement Learning	T1	2	Chalk & Talk
		1.4	Types of Data, Matching	T1	2	Chalk & Talk
		1.5	Stages in Machine Learning	T1	2	Chalk & Talk
		1.6	Data Acquisition, Feature Engineering	T1	2	Chalk & Talk
		1.7	Data Representation	T1	1	Chalk & Talk
		1.8	Model Selection, Model Learning	T1	1	Chalk & Talk
		1.9	Model Evaluation, Model Prediction	T1	2	Chalk & Talk
		1.10	Search and Learning, Data Sets.	T1	2	Chalk & Talk
	FIRST ASSIGNMENT					
	CO2: Apply Search	**Unit-2: Nearest Neighbor-Based Models**				

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DEPARTMENT OF CSE (DATA SCIENCE)
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23DS2202	DATA ENGINEERING (R23)	II-II	CSE (DS)	6	A

COURSE OUTCOMES: After completion of this course, the students would be able to

CO222.1	Interpret the fundamental concepts and roles within data engineering	[K2]
CO222.2	Analyse the stages and major considerations of the data engineering life cycle.	[K4]
CO222.3	Analyse data structures and generate data from various source systems	[K4]
CO222.4	Evaluate and implement effective data storage and ingestion strategies	[K5]
CO222.5	Analyse and optimize data queries and serve data analytics for machine learning	[K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	C01: Interpret the fundamental concepts and roles within data engineering[K2]		**Unit-1.Introduction to Data Engineering:**			
		1.1	Definition, Data Engineering Life Cycle	T1, T2	2	Chalk & Talk
		1.2	Evolution of Data Engineer,	T1, T2	2	Chalk & Talk
		1.3	Data Engineering Versus Data Science	T1, T2, R1	2	Chalk & Talk
		1.4	Data Engineering Skills and Activities	T1, T2	2	Chalk & Talk
		1.5	Data Maturity, Data Maturity Model,	T1, T2	2	Chalk & Talk
		1.6	Skills of a Data Engineer, Business Responsibilities	T1, T2, R1	2	Chalk & Talk
		1.7	Technical Responsibilities,	T1, T2	2	Chalk & Talk
		1.8	Data Engineers and Other Technical Roles.	T1, T2, R1	2	Chalk & Talk
	ASSIGNMENT I EXAMINATION					
2	CO2: Analyse the stages and major considerations of the data engineering life cycle. [K4]		**Unit-2. Data Engineering Life Cycle**			
		2.1	Data Life Cycle Versus Data Engineering Life Cycle	T1, T2	2	Chalk & Talk
		2.2	Generation: Source System, Storage,	T1, T2	2	Chalk & Talk
		2.3	Ingestion, Transformation, Serving Data.	T1, T2	2	Chalk & Talk
		2.4	Major undercurrents across the Data Engineering Life Cycle: Security, Data Management	T1, T2	2	Chalk & Talk
		2.5	Datapost, Data Architecture, Orchestration,	T1, T2, R1	2	Chalk & Talk
		2.6	Software Engineering	T1, T2	2	Chalk & Talk
	MID I EXAMINATION					
3			**Unit-3. Designing Good Data Architecture**			
		3.1	Enterprise Architecture	T1, T2, R1	2	Chalk & Talk
		3.2	Data Architecture	T1, T2	2	Chalk & Talk

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	CO3: Analyze data structures and generate data from various source systems. [K4]	3.3	Principles of Good Data Architecture,	T1, T2	1	Chalk & Talk
		3.4	Major Architecture Concepts	T1, T2, R1	2	Chalk & Talk
		3.5	Data Generation in Source Systems: Sources of Data	T1, T2	3	Chalk & Talk
		3.6	Files and Unstructured Data	T1, T2, R1	2	Chalk & Talk
		3.7	APIs, Application Databases (OLTP), OLAP	T1, T2	2	Chalk & Talk
		3.8	Change Data Capture, Logs, Database Logs, CRUD, Source System Practical Details.	T1, T2	1	Chalk & Talk
ASSIGNMENT II EXAMINATION						
4	CO4: Evaluate and implement effective data storage and ingestion strategies[K5]	**Unit-4. Storage**				
		4.1	Raw Ingredients of Data Storage, Data Storage Systems	T1, T2	1	Chalk & Talk
		4.2	Data Engineering Storage Abstractions,	T1, T2	2	Chalk & Talk
		4.3	Data warehouse, Data Lake, Data Lakehouse	T1	1	Chalk & Talk,
		4.4	Ingestion: Data Ingestion,	T1	2	Chalk & Talk,
		4.5	Key Engineering considerations for the Ingestion Phase,	T2	2	Chalk & Talk
		4.6	Batch Ingestion Considerations	T1, T2	2	Chalk & Talk,
		4.7	Message and Stream Ingestion Considerations	T1, T2	2	Chalk & Talk,
		4.8	Ways to Ingest Data	T1	1	Chalk & Talk,
5	CO5:Analyse and optimize data queries and serve data analytics for machine learning [K4]	**Unit 5: Queries, Modeling and Transformation**				
		5.1	Queries, Life of a Query, Query Optimizer	T1, T2	2	Chalk & Talk
		5.2	Queries on Streaming Data,	T1, T2	1	Chalk & Talk
		5.3	Data Modelling, Modeling Streaming Data,	T1	1	Chalk & Talk
		5.4	Transformations, Streaming Transformations and Processing.	T1	2	Chalk & Talk
		5.5	Serving Data for Analytics, Machine Learning and Reverse ETL: General Considerations for serving Data	T1, T2	1	Chalk & Talk
		5.6	Business Analytics	T1, T2	1	Chalk & Talk
		5.7	Operational Analytics, Embedded Analytics,	T1, T2	1	Chalk & Talk
		5.8	Ways to serve data for analytics and ML, Reverse ETL.	T1, T2, R1	2	Chalk & Talk
TOTAL: 66						
MID II EXAMINATION						
END EXAMINATIONS						

TEXTBOOKS:

1. Joe Reis, Matt Housley, Fundamentals of Data Engineering, O'Reilly Media, Inc.,June 2022,ISBN: 9781098108304

REFERENCE BOOKS:

1. Paul Crickard , Data Engineering with Python,Packt Publishing, October 2020.
2. Ralph Kimball, Margy Ross, The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling, Wiley, 3rd Edition, 2013
3. James Densmore, Data Pipelines Pocket Reference: Moving and Processing Data for Analytics, O'Reilly Media, 1st Edition, 2021

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NARASARAOPETA ENGINEERING COLLEGE
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DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23DS2201	STASTICAL METHODS FOR DATA SCIENCE	II-II	CSE (DS)	5	A

CO221.1	Analyze data and draw conclusion about collection of data and fitting of distributions	[K4]
CO221.2	Analyzing the testing of hypothesis for Large and Small samples	[K4]
CO221.3	Applying skills in problem solving of the regression analysis	[K3]
CO221.4	Applying the significance of Time Series data in various fields	[K3]
CO221.5	Understanding the classification using Logistic Regression	[K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO-1: Analyze data and draw conclusion about collection of data and fitting of distributions [K4]		**UNIT – I: Data Visualization and Distributions**			
		1.1	Introduction to Statistical methods	T1, T2, R1	1	Chalk & Talk, PPT
		1.2	Exploratory Data Analysis	T1, T2, R1	1	Chalk & Talk
		1.3	Charts (Line, Pie, Bar)	T1, T2, R1	1	Chalk & Talk
		1.4	Plots (Bubble, Scatter)	T1, T2, R1	1	Chalk & Talk, PPT
		1.5	Maps (Heat, Dot Distribution)	T1, T2, R1	1	Chalk & Talk
		1.6	Diagrams (Trees and Matrices)	T1, T2, R1	1	Chalk & Talk Student Seminars
		1.7	Principal Components Analysis.	T1, T2, R1, R2,R4	1	Chalk & Talk, PPT
		1.8	Introduction to Data Distributions - Probability Distributions	T1, T2, R1	1	Chalk & Talk PPT
		1.9	Discrete Binomial Distribution	T1, T2, R1	1	Chalk & Talk
		1.10	Discrete Poisson Distribution	T1, T2, R1	1	Chalk & Talk
		1.11	Continuous Distribution-Normal	T1, T2, R1, R2,R4	1	Tutorials
		1.12	Continuous Distribution-Exponential	T1, T2, R1, R2	1	Tutorials
			ASSIGNMENT-I EXAMINATION			
			UNIT – II: Hypothesis Testing			
2	CO-2: Analyzing the testing of hypothesis for Large and Small samples.[K4]	2.1	Introduction to Parametric Estimation	T1, T2,R1	1	Chalk & Talk, PPT
		2.2	Parametric Estimation	T1, T2, R1	1	Chalk & Talk
		2.3	Parametric Confidence Intervals	T1, T2, R1	1	Chalk & Talk
		2.4	Parametric Confidence Intervals	T1, T2, R1	1	Chalk & Talk
		2.5	Choosing a Statistic - Hypothesis Testing	T1, T2, R1	1	Chalk & Talk
		2.6	Hypothesis Testing	T1, T2,R1	1	PPT
		2.7	Parametric test	T1, T2, R1, R2	1	Chalk & Talk
		2.8	T-test	T1, T2, R1, R3,R4	1	Chalk & Talk, PPT

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		2.9	T-test	T1, T2, R1, R2	1	Chalk & Talk
		2.10	Applications to Hypothesis Tests	T1, T2, R1	1	Chalk & Talk Students Seminars
		2.11	Pair wise comparisons.	T1, T2,R1, R2,R4	1	Chalk & Talk, Tutorials
		2.12	Pair wise comparisons.	T1, T2, R1	1	Chalk & Talk
MID-I EXAMINATION						
		UNIT – III: Linear Regression and Multiple Regression				
3	CO-3: Applying skills in problem solving of the regression analysis [K3]	3.1	Introduction to Regression	T1, T2, R1, R2	1	Chalk & Talk, PPT.
		3.2	Linear Regression	T1, T2, R1, R2	1	Chalk & Talk
		3.3	Curvilinear Regression	T1, T2, R1, R2	1	PPT.
		3.4	Exponential Regression	T1, T2, R1, R2	1	Chalk & Talk NPTEL
		3.5	Polynomial Regression	T1, T2, R1, R2	1	Chalk & Talk
		3.6	Power Model	T1, T2, R1, R2	1	Chalk & Talk Student Seminars
		3.7	Practical Examples - The nature of the 'relationship'	T1, T2, R1, R2,R4	1	Chalk & Talk
		3.8	Multiple Linear Regression	T1, T2, R1, R2,R4	1	Chalk & Talk PPT
		3.9	Important measurements of the regression estimate	T1, T2, R1, R2	1	Chalk & Talk Tutorials
		3.10	Multiple Regression with Categorical Explanatory Variables	T1, T2, R1, R2	1	Chalk & Talk
		3.11	Inference in Multiple Regression - Variable Selection.	T1, T2, R1, R2	1	Chalk & Talk PPT
		3.12	Inference in Multiple Regression - Variable Selection.	T1, T2, R1, R2	1	Chalk & Talk Tutorials
ASSIGNMENT-II EXAMINATION						
4	CO-4: Applying the significance of Time Series data in various fields [K3]	**UNIT–IV: Time Series**				
		4.1	Introduction to Time series	T1, T2, R1	1	Chalk & Talk, PPT.
		4.2	Significance of Time series analysis	T1, T2, R1	1	Chalk & Talk
		4.3	Components of Time series	T1, T2, R1	1	Chalk & Talk Students Seminars
		4.4	Secular trend: Graphic method	T1, T2, R1	1	Chalk & Talk, Tutorials
		4.5	Semi-average method	T1, T2, R1	1	Chalk & Talk, Tutorials
		4.6	Method of moving averages	T1, T2, R1, R4	1	Chalk & Talk
		4.7	Method of least squares	T1, T2, R1, R2	1	Chalk & Talk
		4.8	straight line and non-linear trends	T1, T2, R1, R3	1	Chalk & Talk PPT
		4.9	Logarithmic methods – Exponential trends	T1, T2, R1, R3		Chalk & Talk
		4.10	Growth curves	T1, T2, R1, R4	1	Chalk & Talk NPTEL
		4.11	Seasonal Variations: Method of simple averages, Ratio-to-trend method	T1, T2, R1, R2	1	Chalk & Talk
		4.12	Ratio-to-trend method, ratio-to-moving average method, Link relative method.	T1, T2,R1, R4	1	Chalk & Talk PPT
		UNIT–V: Logistic Regression				
		5.1	Introduction to Logistic Regression	T1, T2, R1	1	Chalk & Talk PPT
		5.2	The classification problem	T1, T2, R1		Chalk & Talk, Tutorials
		5.3	The classification problem	T1, T2, R1		Chalk & Talk

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5	CO-5: Understanding the classification using Logistic Regression [K2]	5.4	Logistic Regression Setup	T1, T2, R1	1	Chalk & Talk
		5.5	Logistic Regression Setup	T1, T2, R1	1	Chalk & Talk
		5.6	Interpreting the Results	T1, T2,R1, R3	1	Chalk & Talk PPT
		5.7	Interpreting the Results	T1, T2,R1, R3,R4	1	Chalk & Talk
		5.8	Comparing Models	T1, T2,R1, R3	1	Chalk & Talk Student Seminars
		5.9	Comparing Models	T1, T2,R1, R2,R4	1	Chalk & Talk Student Seminars
		5.10	Classification Using Logistic Regression	T1, T2,R1, R2	1	Chalk & Talk PPT
		5.11	Classification Using Logistic Regression	T1, T2,R1, R3	1	Chalk & Talk
		5.12	Classification Using Logistic Regression	T1, T2,R1, R3	1	Chalk & Talk
			MID-II EXAMINATION			
TOTAL:60						

Text Books:

1. Elizabeth Purdom, "Statistical methods for Data science"
2. K.Murugesan, P.Gurusamy, "Probability, Statistics and Random Processes"

Refrences:

1. Manoj Kumar Srivastava and Namita Srivastava, Statistical Inference – Testing of Hypotheses, Prentice Hall of India, 2014.
2. Robert V Hogg, Elliot A Tannis and Dale L.Zimmerman, Probability and Statistical Inference,9th edition, Pearson publishers,2013.
3. Chris Chatfield, "The analysis of time series an introduction," 5th edition, Chapman & Hall/CRC.
4. Peter J. Brockwell, Richard A.Davis, "Introduction to Time series and Forecasting," Second edition, Springer

WEB SOURCE REFERENCES:

1	https://www.datacamp.com/blog/data-visualization-techniques
2	https://www.analytixlabs.co.in/blog/parametric-and-non-parametric-test/
3	https://www.youtube.com/watch?v=1WlC'Wbhaem8
4	https://www.simplilearn.com/tutorials/statistics-tutorial/what-is-time-series-analysis
5	https://www.youtube.com/watch?v=z9XAXXGwUzM&t=560s

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DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)

LESSON PLAN

ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2201	Probability and Statistics	II-II	CSE(AI-ML)	5	A,B

Course Outcomes:

After completion of this course, the students would be able to:

CO221.1	Classify the concept of data science and its importance	(K2)
CO221.2	Interpret the association of characteristics and through correlation and regression tools	(K4)
CO221.3	Apply discrete and continuous probability distributions	(K3)
CO221.4	Design the components of a classical hypothesis test	(K6)
CO221.5	Infer the statistical internal methods based on small and large sample tests	(K4)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO-1: Classify the concept of data science and its importance (K2).		**UNIT-I : Descriptive Statistics and methods for data science**			
		1.1	Introduction to Data science	T1, T2, R1	1	Chalk & Talk PPT
		1.2	Population Vs sample, collection of Data	T1, T2, R1	1	Chalk & Talk
		1.3	Types of Variables	T1, T2, R1	1	Chalk & Talk
		1.4	Data Visualization charts	T1, T2, R2	1	Chalk & Talk
		1.5	Mean, median,, mode	T1, T2, R1	1	Chalk & Talk
		1.6	Geometric mean, Harmonic mean	T1, T2, R1	1	Chalk & Talk
		1.7	Range, variance,	T1, T2, R1	1	Chalk & Talk
		1.8	Mean & deviation	T1, T2, R1	1	Chalk & Talk
		1.9	Skewness	T1, T2, R1	1	Chalk & Talk
		1.10	Skewness	T1, T2, R1	1	Chalk & Talk Student seminar
		1.11	kurtosis	T1, T2, R1	1	Chalk & Talk
		1.12	kurtosis	T1, T2, R1	1	Chalk & Talk
			ASSIGNMENT-I EXAMINATION			
2	CO-2: Interpret the association of characteristics and through correlation and regression tools (K4).		**UNIT – II: CORRELATION AND CURVE FITTING**			
		2.1	Types of correlation	T1, T2,R1	1	Chalk & Talk PPT
		2.2	Coefficient of correlation	T1, T2,R1	1	Chalk & Talk,
		2.3	Rank correlation coefficient	T1, T2,R1	1	Chalk & Talk,
		2.4	Regression Coefficient and Regression Equation	T1, T2,R1	1	Chalk & Talk NPTEL
		2.5	Fitting a straight Line-Method of least squares	T1, T2,R1	1	Chalk & Talk
		2.6	Fitting a straight Line-Method of least squares	T1, T2,R1	1	Chalk & Talk
		2.7	Fitting a Parabola	T1, T2,R1	1	Chalk & Talk
		2.8	Fitting a Parabola	T1, T2,R1	1	Chalk & Talk

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2	Algorithms to Problem Solving [K3]	2.1	Models: Introduction to Proximity Measures	T1	2	Chalk Talk
		2.2	Distance Measures, Non-Metric Similarity Functions,	T1	2	Chalk & Talk
		2.3	Proximity Between Binary Patterns,	T1	2	Chalk & Talk
		2.4	Different Classification Algorithms Based on the Distance Measures	T1	2	Chalk & Talk
		2.5	,K-Nearest Neighbor Classifier	T1	2	Chalk & Talk
		2.6	Radius Distance Nearest Neighbor Algorithm	T1	2	Chalk & Talk
		2.7	KNN Regression	T1	2	Chalk & Talk
		2.8	Performance of Classifiers,	T1	2	Chalk & Talk
		2.9	Performance of Regression Algorithms.	T1	2	Chalk & Talk
		MID I EXAMINATION				
3	CO 3: Apply techniques for constraint propagation and reasoning under uncertainty [K3]	**Unit-3: Models Based on Decision Trees:**				
		3.1	Decision Trees for Classification	T1	1	Chalk & Talk
		3.2	Impurity Measures, Properties	T1	2	Chalk & Talk
		3.3	Regression Based on Decision Trees	T1	2	Chalk & Talk
		3.4	Bias–Variance Trade-off	T1	2	Chalk & Talk
		3.5	Independence and Naive Bayes Classifier (NBC)	T1	2	Chalk & Talk
4	CO 4: Utilize inductive learning, decision trees, and explanation-based learning for learning from observation. [K3]	**SECOND ASSIGNMENT**				
		Unit-4: Linear Discriminants for Machine Learning:				
		4.1	Introduction to Linear Discriminants	T1	1	Chalk & Talk
		4.2	Linear Discriminants for Classification	T1	2	Chalk & Talk
		4.3	Perceptron Classifier	T1	2	Chalk & Talk
		4.4	Perceptron Learning Algorithm	T1	2	Chalk & Talk
		4.5	Support Vector Machines	T1	1	Chalk & Talk
		4.6	Linearly Non-Separable Case	T1	2	Chalk & Talk
		4.7	Non-linear SVM, Kernel Trick	T1	2	Chalk & Talk

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		4.8	Logistic Regression, Linear Regression	T1	2	Chalk & Talk
		4.9	Multi-Layer Perceptron's (MLPs)	T1	2	Chalk & Talk
		4.10	Backpropagation for Training an MLP	T1	2	Chalk & Talk
5	CO5: Analyze and compare typical expert systems such as MYCIN, DART, and XCON [K4]	**Unit-5: Clustering**				
		5.1	Introduction to Clustering	T1	1	Chalk & Talk
		5.2	Partitioning of Data	T1	2	Chalk & Talk
		5.3	Matrix Factorization	T1	1	Chalk & Talk
		5.4	Clustering of Patterns, Divisive Clustering	T1	2	Chalk & Talk
		5.5	Agglomerative Clustering, Partitional Clustering	T1	2	Chalk & Talk
		5.6	K-Means Clustering	T1	2	Chalk & Talk
		5.7	Soft Partitioning, Soft Clustering	T1	1	Chalk & Talk
		5.8	Fuzzy C-Means Clustering,	T1	2	Chalk & Talk
		5.9	Rough Clustering, Rough K-Means Clustering Algorithm	T1	2	Chalk & Talk
		5.10	Expectation Maximization-Based Clustering ,Spectral Clustering	T1	2	Chalk & Talk
						Total Number of Hours:79
			MID II EXAMINATION			
			END EXAMINATIONS			

TEXT BOOKS	
1	"Machine Learning Theory and Practice", M N Murthy, V S Ananthanarayana, Universities Press (India), 2024
REFERENCE BOOKS	
1	"Machine Learning", Tom M. Mitchell, McGraw-Hill Publication, 2017
2	"Machine Learning in Action", Peter Harrington, DreamTech
3	"Introduction to Data Mining", Pang-Ning Tan, Michel Stenbach, Vipin Kumar, 7th Edition, 2019.
e-Resources:	
1	**https://www.universitiespress.com/MachineLearningTheoryandPractice**

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DEPARTMENT OF CSE (DATA SCIENCE)

LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23DS2203	COMPUTER ORGANIZATION & ARCHITECTURE	II-II	CSE (DS)	5	A

After completion of this course the student should be able to

CO	Course Outcome Statement
CO1	Demonstrate an understanding of the different number systems, codes and relate postulates of Boolean algebra and minimize combinational functions. [K2]
CO2	Evaluate and learn different combinational circuits, sequential circuits and able to design them. [K5]
CO3	Organize, determine and learns basic structure of components register through language, micro operations and able to write micro programs. [K3]
CO4	Determine and able to learn micro programme control and central processing unit. [K3]
CO5	Able to learns the internal organization of computers and able to analyze performance of them. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			Unit-1. Digital Computers and Data Representation			
1	*CO1*:Demonstrate an understanding of the different number systems, codes and relate postulates of Boolean algebra and minimize combinational functions. [K2]	1.1	Number System ,And Number Conversions	T1, R1	3	Chalk & Talk
		1.2	Signed binary numbers, Binary codes.	T1,R1	1	Chalk & Talk
		1.3	CyclicCodes	T1, R1	1	Chalk & Talk
		1.4	Error Detecting Codes, Error Correcting Codes	T1, R1	2	Chalk & Talk
		1.5	Hamming Code for Error Correction	T1, R1	1	Chalk & Talk PPT
		1.6	Alphanumeric Codes, Data types, Complements	T1, R1	2	Chalk & Talk
		1.7	Fixed Point Representation, Floating Point Representation	T1, R1	2	Chalk & Talk
		1.8	**Boolean Algebra and Logical gates** Basic Logic Functions, Logic gates	T1, R1	2	Chalk & Talk
		1.9	universal logic gates	T1, R1	1	Chalk & Talk
		1.10	Boolean functions	T1, R1	2	Chalk & Talk
		1.11	K-MAPS	T1, R1	2	Chalk & Talk
		1.12	Two- level realizations using gates	T1, R1	2	Chalk & Talk
	ASSIGNMENT I- EXAMINATION					
2	CO2: Evaluate and learn different combinational circuits, sequential circuits and able to design them. [K5]		**Unit-2. Digital Logic Circuits**			
		2.1	Combinatorial Circuits	T1,R1	1	Chalk & Talk
		2.2	Combinatorial Circuit Design Procedure,	T1,R1	2	Chalk & Talk
		2.3	Implementation using universal gates,	T1,R1	2	Chalk & Talk
		2.4	Multi-bit adder, Multiplexers	T1,R1	1	Chalk & Talk
		2.5	De-multiplexers,	T1,R1	1	Chalk & Talk
		2.6	Decoders, Sequential Switching Circuits	T1,R1	2	Chalk & Talk
		2.7	Latches and Flip-Flops, Ripple counters using T flip-flops	T1,R1	2	Chalk & Talk
		2.8	Shift Registers; Ring counters.	T1,R1	2	Chalk & Talk

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		MID-I EXAMINATION				
		Unit-3. Computer Arithmetic				
3	CO3: Organize, determine and learns basic structure of components register through language, micro operations and able to write micro programs. [K3]	3.1	Addition and Subtraction of Signed Numbers	T2, R2	1	Chalk & Talk
		3.2	multiplication Algorithms	T2, R2	2	Chalk & Talk
		3.3	Booth multiplication algorithm, Division Algorithms,,	T2, R2	2	Chalk & Talk .
		3.4	Floating – point Arithmetic Operations	T2, R2	2	Chalk & Talk
		3.5	Register Transfer language and microinstructions:	T2, R2	2	Chalk & Talk
		3.6	Busmemory transfer, arithmetic and logical microoperations	T2, R2	2	Chalk & Talk
		3.7	shift and rotate micro-operations.	T2, R2	1	Chalk & Talk
		3.8	Stored program concept, computer Registers	T2, R2	2	Chalk & Talk
		3.9	Common bus system, Computer instructions	T2, R2	2	Chalk & Talk
		3.10	Timing and Control, Instruction cycle, Memory Reference Instructions	T2, R2	2	Chalk & Talk
		3.11	Input–Output configuration and program Interrupt.	T2, R2	1	Chalk & Talk
		ASSIGNMENT II EXAMINATION				
		~~Unit-4 : Microprogrammed Control~~				
4	CO4: Determine and able to learn micro programme control and central processing unit. [K3]	4.1	Control memory, Address sequencing	T2,R2,R3	2	Chalk & Talk
		4.2	microprogram example, design of control unit.	T2,R2, R3	1	Chalk & Talk
		4.3	**Central Processing Unit:** General Register Organization	T2,R2, R3	2	Chalk & Talk
		4.4	Instruction Formats, Addressing modes	T2,R2, R3	2	Chalk & Talk
		4.5	Data Transfer and Manipulation	T2,R2, R3	2	Chalk & Talk
		4.6	**Program Control:** conditional Flags and Branching.	T2,R2, R3	2	Chalk & Talk
		Unit 5. Memory Organization Input/Output Organization				
5	CO4: Analyze the processor, memory and input-output organizations. [K4]	5.1	**Memory Organization:** Memory Hierarchy, Main Memory	T2,R2, R3	2	Chalk & Talk
		5.2	Auxiliary memory, Associate Memory,Cache Memory.	T2,R2, R3	2	Chalk & Talk
		5.3	Input-Output Interface	T2,R2,R3	1	Chalk & Talk
		5.4	Asynchronous data transfer, Modes of Transfer,	T2,R2,R3	2	Chalk & Talk
		5.5	Priority Interrupt Direct memory Access.	T2,R2,R3	2	Chalk & Talk
					TOTAL: 74	
		MID II EXAMINATION				
		END EXAMINATIONS				

TEXT BOOKS:

1. Digital Logic and Computer Design, Moriss Mano, 11th Edition, Pearson.
2. Computer System Architecture,3rd Edition, M.Morris Mano, PHI

Reference Books:

1. Digital Logic and Computer Organization, Rajaraman, Radha krishnan, PHI, 2006
2. Computer Organization, 5Th Edition, Hamacher, Vranesic, Zaky, TMH, 2002
3. Computer Organization & Architecture: Designing for Performance, 7th Edition, William Stallings,

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DEPARTMENT OF CSE (CYBER SECURITY)
LESSONPLAN

Course Code	Course Title(Regulation)	Sem	Branch	Contact Periods/ Week	Sections
R23CY2205	Computer Networks (R23)	II-II	CSE (CYS)	5	A

Cx: 3

COURSE OUT COMES:

After completion of this course, the students would be able to:

CO225.1	Summarize the basics of Computer Networks and its types.	Understanding – [K2]
CO225.2	Illustrate the routing algorithms	Understanding – [K2]
CO225.3	Identify error detection and correction in data link layer.	Applying – [K3]
CO225.4	Explain and formulate IP addresses and subnetting.	Understanding – [K2]
CO225.5	Outline the application layer protocols..	Understanding – [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			Unit-1. Introduction			
1	**CO1:** Summarize the basics of Computer Networks and its types. [K2]	1.1	Types of Computer Networks	T1	2	Chalk &Talk
		1.2	Network technology from local to global	T1	2	Chalk &Talk
		1.3	Network Protocols, Design Goals, Protocol Layering	T1	2	Chalk &Talk
		1.4	The OSI Reference Model	T1	2	Chalk &Talk
		1.5	A Critique of the TCP/IP Reference Model and Protocols.	T1	3	Chalk &Talk
			FIRSTASSIGNMENT			
			Unit-2. Application Layer			
2	**CO2:** Illustrate the routing algorithms. [K2]	1.1	Architecture and Services	T1	3	Chalk &Talk
		1.2	The World Wide Web, Architectural Overview	T1	2	Chalk &Talk
		1.3	IITTP and IITTPS,	T1	2	PPT
		1.4	Server Farms and Web Proxies	T1	2	Chalk &Talk
		1.5	Peer-To-Peer Networks, Evolution of The Internet.	T1	3	Chalk &Talk
			MID-I EXAMINATION			
			Unit-3. Transport Layer			
3	**CO3:** Identify error detection and correction in data link layer. [K3]	3.1	The Transport Service, Services Provided To The Upper Layers	T1	2	Chalk &Talk
		3.2	Transport Service Primitives, Berkeley Sockets	T1	2	Chalk &Talk
		3.3	Error Control And Flow Control, Multiplexing	T1	2	Chalk &Talk
		3.4	Common Transformations and Actions, Persistence	T1	3	Chalk &Talk

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		3.5	Crash Recovery, Congestion Control	T1	2	Chalk &Talk
		3.6	The Internet Transport Protocols: UDP	T1	2	Chalk &Talk
		3.7	The TCP Protocol	T1	2	Chalk &Talk
SECOND ASSIGNMENT						
4	**CO4:** Explain and formulate IP addresses and subnetting. [K2]	**Unit-4. The Network Layer**				
		4.1	Network Layer Design Issues	T1	2	Chalk &Talk
		4.2	Implementation Of Connectionless Service	T1	3	Chalk &Talk
		4.3	The Optimality Principle, Shortest Path Algorithm	T1	2	Chalk &Talk
		4.4	Distance Vector Routing, Link State Routing, Hierarchical Routing Within a Network	T1	2	Chalk &Talk
		4.5	The Need for Traffic Management	T1	3	PPT
		4.6	Internetworks	T1	2	Chalk & Talk
		4.7	Internetwork Routing	T1	2	Chalk & Talk
		4.8	The Network Layer In The Internet	T1	2	Chalk &Talk
		4.9	The IP Version 4 Protocol, IP Addresses, IP Version 6	T1	3	Chalk &Talk
5	**CO5:** Outline the application layer protocols. [K2]	**Unit 5. Data Link Layer**				
		5.1	Guided Transmission Media, Persistent Storage	T1	2	Chalk &Talk
		5.2	Provided To The Network Layer, Framing Error Control	T1	2	PPT
		5.3	Elementary Data Link Protocols	T1	2	PPT
		5.4	Simplex Link-Layer Protocols, Improving Efficiency, Bidirectional Transmission	T1	2	Chalk &Talk
		5.5	Multiple Access Protocols, Aloha, Carrier Sense Multiple Access Protocols, Collision-Free Protocols	T1	2	Chalk &Talk
		5.6	Classic Ethernet Mac Sublayer Protocol	T1	2	Chalk &Talk
		5.7	Retrospective On Ethernet	T1	3	Chalk &Talk
TOTAL NUMBER OF HOURS :74						
MID II EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS:

1. James F. Kurose, Keith W. Ross, "Computer Networking: A Top-Down Approach", 6th edition, Pearson, 2019.
2. Andrew Tanenbaum, Feamster Wetherall, Computer Networks, 6th Edition, Global Edition.

REFERENCE BOOKS:

1. Behrouz A. Forouzan, Data Communications and Networking, 5th Edition, McGraw Hill Publication, 2017.
2. Youlu Zheng, Shakil Akthar, "Networks for Computer Scientists and Engineers", Oxford Publishers, 2016.

WEB REFERENCES:

1. https://nptel.ac.in/courses/106105183/25
2. http://www.nptelvideos.in/2012/11/computer-networks.html
3. https://nptel.ac.in/courses/106105183/3

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DEPARTMENT OF CSE (Cyber Security)
LESSON PLAN

02/85*Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2203	OPERATING SYSTEMS	II-II	CSE (CS)	6	A

After completion of this course, the students would be able to:

CO223.1	Classify various operating system generations, functions and services	[K2]
CO223.2	Analyze process scheduling, management and synchronization	[K4]
CO223.3	Analyze deadlock prevention, detection, avoidance and recovery techniques	[K4]
CO223.4	Analyze various memory management and storage management techniques	[K4]
CO223.5	Analyze the concepts of file system	[K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Classify various operating system generations, functions and services. [K2].		**UNIT-1 Operating System Overview:**			
		1.1	Introduction, Operating system functions	T1	2	Chalk & Talk
		1.2	Operating systems operations, Computing environments	T1	2	Chalk & Talk
		1.3	Free and Open-Source Operating Systems System Structures: Operating System Services	T1	2	Chalk & Talk
		1.4	User and Operating-System Interface, system calls, Types of System Calls	T1	2	Chalk & Talk
		1.5	system programs, Operating system Design and Implementation, Operating system structure	T1	2	Chalk & Talk
		1.6	Building and Booting an Operating System, Operating system debugging	T1	2	Chalk & Talk
FIRST ASSIGNMENT						
2	CO2: Analyze process scheduling, management and synchronization. [K4].		**UNIT-2. PROCESS**			
		2.1	Process Concept, Process scheduling, Operations on processes	T1	2	Chalk & Talk
		2.2	Inter-process communication	T1	2	Chalk & Talk
		2.3	Threads and Concurrency: Multithreading models	T1, R1	2	Chalk & Talk
		2.4	Thread libraries, Threading issues.	T1, R1	2	Chalk & Talk
		2.5	CPU Scheduling: Basic concepts, Scheduling criteria	T1, R1	2	Chalk & Talk
		2.6	Scheduling algorithms, Multiple processor scheduling	T1, R2	2	Chalk & Talk
FIRST MID EXAMINATION						
3	CO3: Analyze deadlock prevention,		**UNIT-3. Synchronization Tools**			
		3.1	The Critical Section Problem, Peterson's Solution	T1, R3	2	Chalk & Talk
		3.2	Mutex Locks, Semaphores	T1, R3	2	Chalk & Talk

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	detection, avoidance and recovery techniques [K4]	3.3	Monitors, Classic problems of Synchronization	T1, R3	2	Chalk & Talk
		3.4	Deadlocks: system Model, Deadlock characterization	T1, R3	2	Chalk & Talk
		3.5	Methods for handling Deadlocks, Deadlock prevention	T1,, R1	2	Chalk & Talk
		3.6	Deadlock avoidance, Deadlock detection, Recovery from Deadlock	T1, R1	2	Chalk & Talk
			SECOND ASSIGNMENT			
4	CO 4: Analyze various memory management and storage management techniques [K4].		**UNIT 4. Memory-Management Strategies**			
		4.1	Introduction, Contiguous memory allocation	T1,R1	2	Chalk &Talk
		4.2	Paging, Structure of the Page Table, Swapping	T1,T2	2	Chalk & Talk
		4.3	Virtual Memory Management: Introduction, Demand paging	T1,R1	2	Chalk & Talk
		4.4	Copy-on-write, Page replacement	T1, R1	2	Chalk & Talk
		4.5	Allocation of frames, Thrashing	T1, R1	2	Chalk & Talk
5	CO 5: Analyze the concepts of file system [K2]		**UNIT 5. Storage Management**			
		5.1	Overview of Mass Storage Structure, HDD Scheduling	T2, R1	2	Chalk & Talk
		5.2	File System: File System Interface: File concept	T2, R1	2	Chalk & Talk
		5.3	Access methods, Directory Structure;	T2, R1	2	Chalk & Talk
		5.4	File system Implementation: File-system structure, File-system Operations, Directory implementation	T2, R1	2	Chalk & Talk
		5.5	Allocation method, Free space management	T2	2	Chalk & Talk
		5.6	File-System Internals: File System Mounting, Partitions and Mounting	T2	2	Chalk & Talk
		5.7	File Sharing. Protection: Goals of protection, Principles of protection, Protection Rings, Domain of protection, Access matrix	T2	2	Chalk & Talk
				Total	60	
			MID II EXAMINATION			
			END EXAMINATIONS			

T	TEXT BOOK
T1	Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018
T2	Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson , 2016

REFERENCE BOOKS

R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018
R2	Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition, McGraw- Hill, 2013

WEB REFERENCES:

1. https://nptel.ac.in/courses/106/106/106106144/
2. http://peterindia.net/OperatingSystems.html

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DEPARTMENT OF CSE (AIML), CSE (CS), CSE (DS), AIML
LESSON PLAN

Course Code	Course Title (Regulation)	Year-Sem	Branch	Contact Periods/Week	Sections
R23CC2204	Database Management Systems (R23)	II-II	AIML	6	A

After completion of this course, the students would be able to:

COURSE OUTCOMES:

CO224.1	Interpret the fundamentals of DBMS. [K2]	[K2]
CO224.2	Analyzing relational database designing. [K4]	[K4]
CO224.3	Developing queries in DBMS [K3]	[K3]
CO224.4	Analyzing database design methodology and normalization process [K4].	[K4]
CO224.5	Analyze transaction concepts and File indexing. [K2]	[K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	DeliveryMethod
1	**CO 1: Interpret** the fundamentals of DBMS. [K2]		**Unit-1. Introduction**			
		1.1	Database system	T1	1	Chalk &Talk
		1.2	Characteristics (Database Vs File System)	T1	1	Chalk &Talk
		1.3	Database Users	T1	1	Chalk &Talk
		1.4	Advantages of Database systems	T1	1	Chalk &Talk
		1.5	Database applications	T1	1	Chalk &Talk
		1.6	Brief introduction of different Data Models	T1	1	Chalk &Talk
		1.7	Concepts of Schema, Instance and data independence	T1	1	Chalk &Talk
		1.8	Three tier schema architecture for data independence	T2	1	Chalk &Talk
		1.9	Database system structure, environment	T1	1	Chalk &Talk
		1.10	Centralized and Client Server architecture for the database	T2	1	Chalk &Talk
		1.11	**Entity Relationship Model:** Introduction	T1	1	Chalk &Talk
		1.12	Representation of entities, attributes	T2	1	Chalk &Talk
		1.13	entity set, relationship, relationship set, constraints	T2	1	Chalk &Talk

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4		4.4	Lossless join and dependency preserving decomposition	T1	1	Chalk &Talk
		4.5	1NF, 2NF and 3 NF	T2	1	Chalk &Talk
		4.6	concept of surrogate key, Boyce-Codd normal form(BCNF)	T1	2	Chalk &Talk
		4.7	MVD, Fourth normal form(4NF), Fifth Normal Form (5NF).	T1	2	Chalk &Talk
		Unit 5. Transaction Concept				
5	**CO5:** Analyze transaction concepts and File indexing. [K2]	5.1	Transaction State, ACID properties	T1	1	Chalk &Talk
		5.2	Concurrent Executions, Serializability, Recoverability	T1	2	Chalk &Talk
		5.3	Implementation of Isolation	T1	1	Chalk &Talk
		5.4	Testing for Serializability	T1	1	Chalk &Talk
		5.5	lock based, time stamp based, optimistic	T1	1	Chalk &Talk
		5.6	concurrency protocols	T1	1	Chalk &Talk
		5.7	Deadlocks	T2	1	Chalk &Talk
		5.8	Failure Classification	T2	1	Chalk &Talk
		5.9	Storage, Recovery and Atomicity	T1	1	Chalk &Talk
		5.10	Recovery algorithm	T1	1	Chalk &Talk
		5.11	Introduction to Indexing Techniques: B+ Trees	T1	1	Chalk &Talk
		5.12	operations on B+Trees	T1	1	Chalk &Talk
		5.13	Hash Based Indexing	T2	1	Chalk &Talk
TOTAL NUMBER OF HOURS: 68						
SECOND MID EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS:

1. Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
2. Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)

REFERENCE BOOKS:

1. Introduction to Database Systems, 8thedition, C J Date, Pearson.
2. Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson
3. Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

WEB-RESOURCES:

1. https://nptel.ac.in/courses/106/105/106105175/
2. https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_012758066672820224 56_shared/overview

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DEPARTMENT OF CSE (CYBER SECURITY)
LESSONPLAN

Course Code	Course Title(Regulation)	Sem	Branch	Contact Periods/ Week	Sections
R23CY2205	Computer Networks (R23)	II-II	CSE (CYS)	5	A

Cr: 3

COURSE OUT COMES:

After completion of this course, the students would be able to:

CO225.1	Summarize the basics of Computer Networks and its types.	Understanding – [K2]
CO225.2	Illustrate the routing algorithms	Understanding – [K2]
CO225.3	Identify error detection and correction in data link layer.	Applying – [K3]
CO225.4	Explain and formulate IP addresses and subnetting.	Understanding – [K2]
CO225.5	Outline the application layer protocols..	Understanding – [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			Unit-1. Introduction			
1	**CO1**: Summarize the basics of Computer Networks and its types. [K2]	1.1	Types of Computer Networks	T1	2	Chalk &Talk
		1.2	Network technology from local to global	T1	2	Chalk &Talk
		1.3	Network Protocols, Design Goals, Protocol Layering	T1	2	Chalk &Talk
		1.4	The OSI Reference Model	T1	2	Chalk &Talk
		1.5	A Critique of the TCP/IP Reference Model and Protocols.	T1	3	Chalk &Talk
			FIRSTASSIGNMENT			
			Unit-2. Application Layer			
2	**CO2:** Illustrate the routing algorithms. [K2]	1.1	Architecture and Services	T1	3	Chalk &Talk
		1.2	The World Wide Web, Architectural Overview	T1	2	Chalk &Talk
		1.3	IITTP and IITTPS,	T1	2	PPT
		1.4	Server Farms and Web Proxies	T1	2	Chalk &Talk
		1.5	Peer-To-Peer Networks, Evolution of The Internet.	T1	3	Chalk &Talk
			MID-I EXAMINATION			
			Unit-3. Transport Layer			
3	**CO3:** Identify error detection and correction in data link layer. [K3]	3.1	The Transport Service, Services Provided To The Upper Layers	T1	2	Chalk &Talk
		3.2	Transport Service Primitives, Berkeley Sockets	T1	2	Chalk &Talk
		3.3	Error Control And Flow Control, Multiplexing	T1	2	Chalk &Talk
		3.4	Common Transformations and Actions, Persistence	T1	3	Chalk &Talk

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		3.5	Crash Recovery, Congestion Control	T1	2	Chalk &Talk
		3.6	The Internet Transport Protocols: UDP	T1	2	Chalk &Talk
		3.7	The TCP Protocol	T1	2	Chalk &Talk
SECOND ASSIGNMENT						
4	**CO4:** Explain and formulate IP addresses and subnetting. [K2]	**Unit-4. The Network Layer**				
		4.1	Network Layer Design Issues	T1	2	Chalk &Talk
		4.2	Implementation Of Connectionless Service	T1	3	Chalk &Talk
		4.3	The Optimality Principle, Shortest Path Algorithm	T1	2	Chalk &Talk
		4.4	Distance Vector Routing, Link State Routing, Hierarchical Routing Within a Network	T1	2	Chalk &Talk
		4.5	The Need for Traffic Management	T1	3	PPT
		4.6	Internetworks	T1	2	Chalk & Talk
		4.7	Internetwork Routing	T1	2	Chalk & Talk
		4.8	The Network Layer In The Internet	T1	2	Chalk &Talk
		4.9	The IP Version 4 Protocol, IP Addresses, IP Version 6	T1	3	Chalk &Talk
5	**CO5:** Outline the application layer protocols. [K2]	**Unit 5. Data Link Layer**				
		5.1	Guided Transmission Media, Persistent Storage	T1	2	Chalk &Talk
		5.2	Provided To The Network Layer, Framing Error Control	T1	2	PPT
		5.3	Elementary Data Link Protocols	T1	2	PPT
		5.4	Simplex Link-Layer Protocols, Improving Efficiency, Bidirectional Transmission	T1	2	Chalk &Talk
		5.5	Multiple Access Protocols, Aloha, Carrier Sense Multiple Access Protocols, Collision-Free Protocols	T1	2	Chalk &Talk
		5.6	Classic Ethernet Mac Sublayer Protocol	T1	2	Chalk &Talk
		5.7	Retrospective On Ethernet	T1	3	Chalk &Talk
TOTAL NUMBER OF HOURS :74						
MID II EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS:

1. James F. Kurose, Keith W. Ross, "Computer Networking: A Top-Down Approach", 6th edition, Pearson, 2019.
2. Andrew Tanenbaum, Feamster Wetherall, Computer Networks, 6th Edition, Global Edition.

REFERENCE BOOKS:

1. Behrouz A. Forouzan, Data Communications and Networking, 5th Edition, McGraw Hill Publication, 2017.
2. Youlu Zheng, Shakil Akthar, "Networks for Computer Scientists and Engineers", Oxford Publishers, 2016.

WEB REFERENCES:

1. https://nptel.ac.in/courses/106105183/25
2. http://www.nptelvideos.in/2012/11/computer-networks.html
3. https://nptel.ac.in/courses/106105183/3

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF CSE (DATA SCIENCE)

LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23DS2203	COMPUTER ORGANIZATION & ARCHITECTURE	II-II	CSE (DS)	5	A

After completion of this course the student should be able to

CO	Course Outcome Statement
CO1	Demonstrate an understanding of the different number systems, codes and relate postulates of Boolean algebra and minimize combinational functions. [K2]
CO2	Evaluate and learn different combinational circuits, sequential circuits and able to design them. [K5]
CO3	Organize, determine and learns basic structure of components register through language, micro operations and able to write micro programs. [K3]
CO4	Determine and able to learn micro programme control and central processing unit. [K3]
CO5	Able to learns the internal organization of computers and able to analyze performance of them. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	*CO1*:Demonstrate an understanding of the different number systems, codes and relate postulates of Boolean algebra and minimize combinational functions. [K2]		**Unit-1. Digital Computers and Data Representation**			
		1.1	Number System ,And Number Conversions	T1, R1	3	Chalk & Talk
		1.2	Signed binary numbers, Binary codes.	T1,R1	1	Chalk & Talk
		1.3	CyclicCodes	T1, R1	1	Chalk & Talk
		1.4	Error Detecting Codes, Error Correcting Codes	T1, R1	2	Chalk & Talk
		1.5	Hamming Code for Error Correction	T1, R1	1	Chalk & Talk PPT
		1.6	Alphanumeric Codes, Data types, Complements	T1, R1	2	Chalk & Talk
		1.7	Fixed Point Representation, Floating Point Representation	T1, R1	2	Chalk & Talk
		1.8	**Boolean Algebra and Logical gates** Basic Logic Functions, Logic gates	T1, R1	2	Chalk & Talk
		1.9	universal logic gates	T1, R1	1	Chalk & Talk
		1.10	Boolean functions	T1, R1	2	Chalk & Talk
		1.11	K-MAPS	T1, R1	2	Chalk & Talk
		1.12	Two- level realizations using gates	T1, R1	2	Chalk & Talk
ASSIGNMENT I- EXAMINATION						
2	CO2: Evaluate and learn different combinational circuits, sequential circuits and able to design them. [K5]		**Unit-2. Digital Logic Circuits**			
		2.1	Combinatorial Circuits	T1,R1	1	Chalk & Talk
		2.2	Combinatorial Circuit Design Procedure,	T1,R1	2	Chalk & Talk
		2.3	Implementation using universal gates,	T1,R1	2	Chalk & Talk
		2.4	Multi-bit adder, Multiplexers	T1,R1	1	Chalk & Talk
		2.5	De-multiplexers,	T1,R1	1	Chalk & Talk
		2.6	Decoders, Sequential Switching Circuits	T1,R1	2	Chalk & Talk
		2.7	Latches and Flip-Flops, Ripple counters using T flip-flops	T1,R1	2	Chalk & Talk
		2.8	Shift Registers; Ring counters.	T1,R1	2	Chalk & Talk

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		MID-I EXAMINATION				
		Unit-3. Computer Arithmetic				
3	CO3: Organize, determine and learns basic structure of components register through language, micro operations and able to write micro programs. [K3]	3.1	Addition and Subtraction of Signed Numbers	T2, R2	1	Chalk & Talk
		3.2	multiplication Algorithms	T2, R2	2	Chalk & Talk
		3.3	Booth multiplication algorithm, Division Algorithms,,	T2, R2	2	Chalk & Talk .
		3.4	Floating – point Arithmetic Operations	T2, R2	2	Chalk & Talk
		3.5	Register Transfer language and microinstructions:	T2, R2	2	Chalk & Talk
		3.6	Busmemory transfer, arithmetic and logical microoperations	T2, R2	2	Chalk & Talk
		3.7	shift and rotate micro-operations.	T2, R2	1	Chalk & Talk
		3.8	Stored program concept, computer Registers	T2, R2	2	Chalk & Talk
		3.9	Common bus system, Computer instructions	T2, R2	2	Chalk & Talk
		3.10	Timing and Control, Instruction cycle, Memory Reference Instructions	T2, R2	2	Chalk & Talk
		3.11	Input–Output configuration and program Interrupt.	T2, R2	1	Chalk & Talk
		ASSIGNMENT II EXAMINATION				
4	CO4: Determine and able to learn micro programme control and central processing unit. [K3]	**~~Unit 4 : Microprogrammed Control~~**				
		4.1	Control memory, Address sequencing	T2,R2,R3	2	Chalk & Talk
		4.2	microprogram example, design of control unit.	T2,R2, R3	1	Chalk & Talk
		4.3	**Central Processing Unit:** General Register Organization	T2,R2, R3	2	Chalk & Talk
		4.4	Instruction Formats, Addressing modes	T2,R2, R3	2	Chalk & Talk
		4.5	Data Transfer and Manipulation	T2,R2, R3	2	Chalk & Talk
		4.6	**Program Control:** conditional Flags and Branching.	T2,R2, R3	2	Chalk & Talk
5	CO4: Analyze the processor, memory and input-output organizations. [K4]	**Unit 5. Memory Organization Input/Output Organization**				
		5.1	**Memory Organization:** Memory Hierarchy, Main Memory	T2,R2, R3	2	Chalk & Talk
		5.2	Auxiliary memory, Associate Memory,Cache Memory.	T2,R2, R3	2	Chalk & Talk
		5.3	Input-Output Interface	T2,R2,R3	1	Chalk & Talk
		5.4	Asynchronous data transfer, Modes of Transfer,	T2,R2,R3	2	Chalk & Talk
		5.5	Priority Interrupt Direct memory Access.	T2,R2,R3	2	Chalk & Talk
					TOTAL: 74	
		MID II EXAMINATION				
		END EXAMINATIONS				

TEXT BOOKS:

1. Digital Logic and Computer Design, Moriss Mano, 11th Edition, Pearson.
2. Computer System Architecture,3rd Edition, M.Morris Mano, PHI

Reference Books:

1. Digital Logic and Computer Organization, Rajaraman, Radha krishnan, PHI, 2006
2. Computer Organization, 5Th Edition, Hamacher, Vranesic, Zaky, TMH, 2002
3. Computer Organization & Architecture: Designing for Performance, 7th Edition, William Stallings,

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF CSE (AIML)

LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R23CC2206	MACHINE LEARNING (R23)	II-II	CSE (AIML)	5	A,B

COURSE OUTCOMES:

After successful completion of this course, students will be able to:

CO1	Analyze and Design Intelligent Agents	[K4]
CO2	Apply Search Algorithms to Problem Solving	[K3]
CO3	Apply techniques for constraint propagation and reasoning under uncertainty	[K3]
CO4	Utilize inductive learning, decision trees, and explanation-based learning for learning from Observation.	[K3]
CO5	Analyze and compare typical expert systems such as MYCIN, DART, and XCON	[K4]

Unit No	Outcome		Topics/Activity	Ref./ Text Book	Hours	Delivery Method
1	CO1: Analyze and Design Intelligent Agents [K4]	**Unit-1: Introduction to Machine Learning:**				
		1.1	Evolution of Machine Learning	T1	2	Chalk & Talk
		1.2	Paradigms for ML, Learning by Rote	T1	2	Chalk & Talk
		1.3	Learning by Induction, Reinforcement Learning	T1	2	Chalk & Talk
		1.4	Types of Data, Matching	T1	2	Chalk & Talk
		1.5	Stages in Machine Learning	T1	2	Chalk & Talk
		1.6	Data Acquisition, Feature Engineering	T1	2	Chalk & Talk
		1.7	Data Representation	T1	1	Chalk & Talk
		1.8	Model Selection, Model Learning	T1	1	Chalk & Talk
		1.9	Model Evaluation, Model Prediction	T1	2	Chalk & Talk
		1.10	Search and Learning, Data Sets.	T1	2	Chalk & Talk
		FIRST ASSIGNMENT				
	CO2: Apply Search	**Unit-2: Nearest Neighbour Based Models**				

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2	Algorithms to Problem Solving [K3]	2.1	Models: Introduction to Proximity Measures	T1	2	Chalk Talk
		2.2	Distance Measures, Non-Metric Similarity Functions,	T1	2	Chalk & Talk
		2.3	Proximity Between Binary Patterns,	T1	2	Chalk & Talk
		2.4	Different Classification Algorithms Based on the Distance Measures	T1	2	Chalk & Talk
		2.5	,K-Nearest Neighbor Classifier	T1	2	Chalk & Talk
		2.6	Radius Distance Nearest Neighbor Algorithm	T1	2	Chalk & Talk
		2.7	KNN Regression	T1	2	Chalk & Talk
		2.8	Performance of Classifiers,	T1	2	Chalk & Talk
		2.9	Performance of Regression Algorithms.	T1	2	Chalk & Talk
		MID I EXAMINATION				
3	CO 3: Apply techniques for constraint propagation and reasoning under uncertainty [K3]	**Unit-3: Models Based on Decision Trees:**				
		3.1	Decision Trees for Classification	T1	1	Chalk & Talk
		3.2	Impurity Measures, Properties	T1	2	Chalk & Talk
		3.3	Regression Based on Decision Trees	T1	2	Chalk & Talk
		3.4	Bias–Variance Trade-off	T1	2	Chalk & Talk
		3.5	Independence and Naive Bayes Classifier (NBC)	T1	2	Chalk & Talk
4	CO 4: Utilize inductive learning, decision trees, and explanation-based learning for learning from observation. [K3]	**SECOND ASSIGNMENT**				
		Unit-4: Linear Discriminants for Machine Learning:				
		4.1	Introduction to Linear Discriminants	T1	1	Chalk & Talk
		4.2	Linear Discriminants for Classification	T1	2	Chalk & Talk
		4.3	Perceptron Classifier	T1	2	Chalk & Talk
		4.4	Perceptron Learning Algorithm	T1	2	Chalk & Talk
		4.5	Support Vector Machines	T1	1	Chalk & Talk
		4.6	Linearly Non-Separable Case	T1	2	Chalk & Talk
		4.7	Non-linear SVM, Kernel Trick	T1	2	Chalk & Talk

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		4.8	Logistic Regression, Linear Regression	T1	2	Chalk & Talk
		4.9	Multi-Layer Perceptron's (MLPs)	T1	2	Chalk & Talk
		4.10	Backpropagation for Training an MLP	T1	2	Chalk & Talk
5	CO5: Analyze and compare typical expert systems such as MYCIN, DART, and XCON [K4]	**Unit-5: Clustering**				
		5.1	Introduction to Clustering	T1	1	Chalk & Talk
		5.2	Partitioning of Data	T1	2	Chalk & Talk
		5.3	Matrix Factorization	T1	1	Chalk & Talk
		5.4	Clustering of Patterns, Divisive Clustering	T1	2	Chalk & Talk
		5.5	Agglomerative Clustering, Partitional Clustering	T1	2	Chalk & Talk
		5.6	K-Means Clustering	T1	2	Chalk & Talk
		5.7	Soft Partitioning, Soft Clustering	T1	1	Chalk & Talk
		5.8	Fuzzy C-Means Clustering,	T1	2	Chalk & Talk
		5.9	Rough Clustering, Rough K-Means Clustering Algorithm	T1	2	Chalk & Talk
		5.10	Expectation Maximization-Based Clustering ,Spectral Clustering	T1	2	Chalk & Talk
					Total Number of Hours:79	
		MID II EXAMINATION				
		END EXAMINATIONS				

TEXT BOOKS

1	"Machine Learning Theory and Practice", M N Murthy, V S Ananthanarayana, Universities Press (India), 2024

REFERENCE BOOKS

1	"Machine Learning", Tom M. Mitchell, McGraw-Hill Publication, 2017
2	"Machine Learning in Action", Peter Harrington, DreamTech
3	"Introduction to Data Mining", Pang-Ning Tan, Michel Stenbach, Vipin Kumar, 7th Edition, 2019.

e-Resources:

1	**https://www.universitiespress.com/MachineLearningTheoryandPractice**

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DEPARTMENT OF AIML
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R23CC2206	MACHINE LEARNING (R23)	II-II	AIML	5	A

COURSE OUTCOMES: Cr-3

After successful completion of this course, students will be able to:

CO1	Analyze and Design Intelligent Agents	[K4]
CO2	Apply Search Algorithms to Problem Solving	[K3]
CO3	Apply techniques for constraint propagation and reasoning under uncertainty	[K3]
CO4	Utilize inductive learning, decision trees, and explanation-based learning for learning from Observation.	[K3]
CO5	Analyze and compare typical expert systems such as MYCIN, DART, and XCON	[K4]

Unit No	Outcome		Topics/Activity	Ref./ Text Book	Hours	Delivery Method
1	CO1: Analyze and Design Intelligent Agents [K4]	**Unit-1: Introduction to Machine Learning:**				
		1.1	Evolution of Machine Learning	T1	2	Chalk & Talk
		1.2	Paradigms for ML, Learning by Rote	T1	2	Chalk & Talk
		1.3	Learning by Induction, Reinforcement Learning	T1	2	Chalk & Talk
		1.4	Types of Data, Matching	T1	2	Chalk & Talk
		1.5	Stages in Machine Learning	T1	2	Chalk & Talk
		1.6	Data Acquisition, Feature Engineering	T1	2	Chalk & Talk
		1.7	Data Representation	T1	1	Chalk & Talk
		1.8	Model Selection, Model Learning	T1	1	Chalk & Talk
		1.9	Model Evaluation, Model Prediction	T1	2	Chalk & Talk
		1.10	Search and Learning, Data Sets.	T1	2	Chalk & Talk
	FIRST ASSIGNMENT					
	CO2: Apply Search	**Unit-2: Nearest Neighbor-Based Models**				

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2	Algorithms to Problem Solving [K3]	2.1	Models: Introduction to Proximity Measures	T1	2	Chalk Talk
		2.2	Distance Measures, Non-Metric Similarity Functions,	T1	2	Chalk & Talk
		2.3	Proximity Between Binary Patterns,	T1	2	Chalk & Talk
		2.4	Different Classification Algorithms Based on the Distance Measures	T1	2	Chalk & Talk
		2.5	,K-Nearest Neighbor Classifier	T1	2	Chalk & Talk
		2.6	Radius Distance Nearest Neighbor Algorithm	T1	2	Chalk & Talk
		2.7	KNN Regression	T1	2	Chalk & Talk
		2.8	Performance of Classifiers,	T1	2	Chalk & Talk
		2.9	Performance of Regression Algorithms.	T1	2	Chalk & Talk
		MID I EXAMINATION				
3	CO 3: Apply techniques for constraint propagation and reasoning under uncertainty [K3]	**Unit-3: Models Based on Decision Trees:**				
		3.1	Decision Trees for Classification	T1	1	Chalk & Talk
		3.2	Impurity Measures, Properties	T1	2	Chalk & Talk
		3.3	Regression Based on Decision Trees	T1	2	Chalk & Talk
		3.4	Bias–Variance Trade-off	T1	2	Chalk & Talk
		3.5	Independence and Naive Bayes Classifier (NBC)	T1	2	Chalk & Talk
4	CO 4: Utilize inductive learning, decision trees, and explanation-based learning for learning from observation. [K3]	**SECOND ASSIGNMENT**				
		Unit-4: Linear Discriminants for Machine Learning:				
		4.1	Introduction to Linear Discriminants	T1	1	Chalk & Talk
		4.2	Linear Discriminants for Classification	T1	2	Chalk & Talk
		4.3	Perceptron Classifier	T1	2	Chalk & Talk
		4.4	Perceptron Learning Algorithm	T1	2	Chalk & Talk
		4.5	Support Vector Machines	T1	1	Chalk & Talk
		4.6	Linearly Non-Separable Case	T1	2	Chalk & Talk
		4.7	Non-linear SVM, Kernel Trick	T1	2	Chalk & Talk

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		4.8	Logistic Regression, Linear Regression	T1	2	Chalk & Talk
		4.9	Multi-Layer Perceptron's (MLPs)	T1	2	Chalk & Talk
		4.10	Backpropagation for Training an MLP	T1	2	Chalk & Talk
5	CO5: Analyze and compare typical expert systems such as MYCIN, DART, and XCON [K4]	**Unit-5: Clustering**				
		5.1	Introduction to Clustering	T1	1	Chalk & Talk
		5.2	Partitioning of Data	T1	2	Chalk & Talk
		5.3	Matrix Factorization	T1	1	Chalk & Talk
		5.4	Clustering of Patterns, Divisive Clustering	T1	2	Chalk & Talk
		5.5	Agglomerative Clustering, Partitional Clustering	T1	2	Chalk & Talk
		5.6	K-Means Clustering	T1	2	Chalk & Talk
		5.7	Soft Partitioning, Soft Clustering	T1	1	Chalk & Talk
		5.8	Fuzzy C-Means Clustering,	T1	2	Chalk & Talk
		5.9	Rough Clustering, Rough K-Means Clustering Algorithm	T1	2	Chalk & Talk
		5.10	Expectation Maximization-Based Clustering ,Spectral Clustering	T1	2	Chalk & Talk
						Total Number of Hours:79
			MID II EXAMINATION			
			END EXAMINATIONS			

TEXT BOOKS	
1	"Machine Learning Theory and Practice", M N Murthy, V S Ananthanarayana, Universities Press (India), 2024
REFERENCE BOOKS	
1	"Machine Learning", Tom M. Mitchell, McGraw-Hill Publication, 2017
2	"Machine Learning in Action", Peter Harrington, DreamTech
3	"Introduction to Data Mining", Pang-Ning Tan, Michel Stenbach, Vipin Kumar, 7th Edition, 2019.
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1	https://www.universitiespress.com/MachineLearningTheoryandPractice

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda (Post), Narasaraopet- 522601

DEPARTMENT OF CSE (DATA SCIENCE)
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23DS2202	DATA ENGINEERING (R23)	II-II	CSE (DS)	6	A

COURSE OUTCOMES: After completion of this course, the students would be able to

CO222.1	Interpret the fundamental concepts and roles within data engineering	[K2]
CO222.2	Analyse the stages and major considerations of the data engineering life cycle.	[K4]
CO222.3	Analyse data structures and generate data from various source systems	[K4]
CO222.4	Evaluate and implement effective data storage and ingestion strategies	[K5]
CO222.5	Analyse and optimize data queries and serve data analytics for machine learning	[K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	C01: Interpret the fundamental concepts and roles within data engineering[K2]		**Unit-1.Introduction to Data Engineering:**			
		1.1	Definition, Data Engineering Life Cycle	T1, T2	2	Chalk & Talk
		1.2	Evolution of Data Engineer,	T1, T2	2	Chalk & Talk
		1.3	Data Engineering Versus Data Science	T1, T2, R1	2	Chalk & Talk
		1.4	Data Engineering Skills and Activities	T1, T2	2	Chalk & Talk
		1.5	Data Maturity, Data Maturity Model,	T1, T2	2	Chalk & Talk
		1.6	Skills of a Data Engineer, Business Responsibilities	T1, T2, R1	2	Chalk & Talk
		1.7	Technical Responsibilities,	T1, T2	2	Chalk & Talk
		1.8	Data Engineers and Other Technical Roles.	T1, T2, R1	2	Chalk & Talk
			ASSIGNMENT I EXAMINATION			
2	CO2: Analyse the stages and major considerations of the data engineering life cycle. [K4]		**Unit-2. Data Engineering Life Cycle**			
		2.1	Data Life Cycle Versus Data Engineering Life Cycle	T1, T2	2	Chalk & Talk
		2.2	Generation: Source System, Storage,	T1, T2	2	Chalk & Talk
		2.3	Ingestion, Transformation, Serving Data.	T1, T2	2	Chalk & Talk
		2.4	Major undercurrents across the Data Engineering Life Cycle: Security, Data Management	T1, T2	2	Chalk & Talk
		2.5	Datapost, Data Architecture, Orchestration,	T1, T2, R1	2	Chalk & Talk
		2.6	Software Engineering	T1, T2	2	Chalk & Talk
			MID I EXAMINATION			
3			**Unit-3. Designing Good Data Architecture**			
		3.1	Enterprise Architecture	T1, T2, R1	2	Chalk & Talk
		3.2	Data Architecture	T1, T2	2	Chalk & Talk

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	CO3: Analyze data structures and generate data from various source systems. [K4]	3.3	Principles of Good Data Architecture,	T1, T2	1	Chalk & Talk
		3.4	Major Architecture Concepts	T1, T2, R1	2	Chalk & Talk
		3.5	Data Generation in Source Systems: Sources of Data	T1, T2	3	Chalk & Talk
		3.6	Files and Unstructured Data	T1, T2, R1	2	Chalk & Talk
		3.7	APIs, Application Databases (OLTP), OLAP	T1, T2	2	Chalk & Talk
		3.8	Change Data Capture, Logs, Database Logs, CRUD, Source System Practical Details.	T1, T2	1	Chalk & Talk
	ASSIGNMENT II EXAMINATION					
4	CO4: Evaluate and implement effective data storage and ingestion strategies[K5]		**Unit-4. Storage**			
		4.1	Raw Ingredients of Data Storage, Data Storage Systems	T1, T2	1	Chalk & Talk
		4.2	Data Engineering Storage Abstractions,	T1, T2	2	Chalk & Talk
		4.3	Data warehouse, Data Lake, Data Lakehouse	T1	1	Chalk & Talk,
		4.4	Ingestion: Data Ingestion,	T1	2	Chalk & Talk,
		4.5	Key Engineering considerations for the Ingestion Phase,	T2	2	Chalk & Talk
		4.6	Batch Ingestion Considerations	T1, T2	2	Chalk & Talk,
		4.7	Message and Stream Ingestion Considerations	T1, T2	2	Chalk & Talk,
		4.8	Ways to Ingest Data	T1	1	Chalk & Talk,
5	CO5:Analyse and optimize data queries and serve data analytics for machine learning [K4]		**Unit 5: Queries, Modeling and Transformation**			
		5.1	Queries, Life of a Query, Query Optimizer	T1, T2	2	Chalk & Talk
		5.2	Queries on Streaming Data,	T1, T2	1	Chalk & Talk
		5.3	Data Modelling, Modeling Streaming Data,	T1	1	Chalk & Talk
		5.4	Transformations, Streaming Transformations and Processing.	T1	2	Chalk & Talk
		5.5	Serving Data for Analytics, Machine Learning and Reverse ETL: General Considerations for serving Data	T1, T2	1	Chalk & Talk
		5.6	Business Analytics	T1, T2	1	Chalk & Talk
		5.7	Operational Analytics, Embedded Analytics,	T1, T2	1	Chalk & Talk
		5.8	Ways to serve data for analytics and ML, Reverse ETL.	T1, T2, R1	2	Chalk & Talk
					TOTAL: 66	
	MID II EXAMINATION					
	END EXAMINATIONS					

TEXTBOOKS:

1. Joe Reis, Matt Housley, Fundamentals of Data Engineering, O'Reilly Media, Inc.,June 2022,ISBN: 9781098108304

REFERENCE BOOKS:

1. Paul Crickard , Data Engineering with Python,Packt Publishing, October 2020.
2. Ralph Kimball, Margy Ross, The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling, Wiley, 3rd Edition, 2013
3. James Densmore, Data Pipelines Pocket Reference: Moving and Processing Data for Analytics, O'Reilly Media, 1st Edition, 2021

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DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23DS2201	STASTICAL METHODS FOR DATA SCIENCE	II-II	CSE (DS)	5	A

CO221.1	Analyze data and draw conclusion about collection of data and fitting of distributions	[K4]
CO221.2	Analyzing the testing of hypothesis for Large and Small samples	[K4]
CO221.3	Applying skills in problem solving of the regression analysis	[K3]
CO221.4	Applying the significance of Time Series data in various fields	[K3]
CO221.5	Understanding the classification using Logistic Regression	[K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT – I: Data Visualization and Distributions			
1	CO-1: Analyze data and draw conclusion about collection of data and fitting of distributions [K4]	1.1	Introduction to Statistical methods	T1, T2, R1	1	Chalk & Talk, PPT
		1.2	Exploratory Data Analysis	T1, T2, R1	1	Chalk & Talk
		1.3	Charts (Line, Pie, Bar)	T1, T2, R1	1	Chalk & Talk
		1.4	Plots (Bubble, Scatter)	T1, T2, R1	1	Chalk & Talk, PPT
		1.5	Maps (Heat, Dot Distribution)	T1, T2, R1	1	Chalk & Talk
		1.6	Diagrams (Trees and Matrices)	T1, T2, R1	1	Chalk & Talk Student Seminars
		1.7	Principal Components Analysis.	T1, T2, R1, R2,R4	1	Chalk & Talk, PPT
		1.8	Introduction to Data Distributions - Probability Distributions	T1, T2, R1	1	Chalk & Talk PPT
		1.9	Discrete Binomial Distribution	T1, T2, R1	1	Chalk & Talk
		1.10	Discrete Poisson Distribution	T1, T2, R1	1	Chalk & Talk
		1.11	Continuous Distribution-Normal	T1, T2, R1, R2,R4	1	Tutorials
		1.12	Continuous Distribution-Exponential	T1, T2, R1, R2	1	Tutorials
			ASSIGNMENT-I EXAMINATION			
			UNIT – II: Hypothesis Testing			
2	CO-2: Analyzing the testing of hypothesis for Large and Small samples.[K4]	2.1	Introduction to Parametric Estimation	T1, T2,R1	1	Chalk & Talk, PPT
		2.2	Parametric Estimation	T1, T2, R1	1	Chalk & Talk
		2.3	Parametric Confidence Intervals	T1, T2, R1	1	Chalk & Talk
		2.4	Parametric Confidence Intervals	T1, T2, R1	1	Chalk & Talk
		2.5	Choosing a Statistic - Hypothesis Testing	T1, T2, R1	1	Chalk & Talk
		2.6	Hypothesis Testing	T1, T2,R1	1	PPT
		2.7	Parametric test	T1, T2, R1, R2	1	Chalk & Talk
		2.8	T-test	T1, T2, R1, R3,R4	1	Chalk & Talk, PPT

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		2.9	T-test	T1, T2, R1, R2	1	Chalk & Talk
		2.10	Applications to Hypothesis Tests	T1, T2, R1	1	Chalk & Talk Students Seminars
		2.11	Pair wise comparisons.	T1, T2,R1, R2,R4	1	Chalk & Talk, Tutorials
		2.12	Pair wise comparisons.	T1, T2, R1	1	Chalk & Talk
MID-I EXAMINATION						
		UNIT – III: Linear Regression and Multiple Regression				
3	CO-3: Applying skills in problem solving of the regression analysis [K3]	3.1	Introduction to Regression	T1, T2, R1, R2	1	Chalk & Talk, PPT.
		3.2	Linear Regression	T1, T2, R1, R2	1	Chalk & Talk
		3.3	Curvilinear Regression	T1, T2, R1, R2	1	PPT.
		3.4	Exponential Regression	T1, T2, R1, R2	1	Chalk & Talk NPTEL
		3.5	Polynomial Regression	T1, T2, R1, R2	1	Chalk & Talk
		3.6	Power Model	T1, T2, R1, R2	1	Chalk & Talk Student Seminars
		3.7	Practical Examples - The nature of the 'relationship'	T1, T2, R1, R2,R4	1	Chalk & Talk
		3.8	Multiple Linear Regression	T1, T2, R1, R2,R4	1	Chalk & Talk PPT
		3.9	Important measurements of the regression estimate	T1, T2, R1, R2	1	Chalk & Talk Tutorials
		3.10	Multiple Regression with Categorical Explanatory Variables	T1, T2, R1, R2	1	Chalk & Talk
		3.11	Inference in Multiple Regression - Variable Selection.	T1, T2, R1, R2	1	Chalk & Talk PPT
		3.12	Inference in Multiple Regression - Variable Selection.	T1, T2, R1, R2	1	Chalk & Talk Tutorials
ASSIGNMENT-II EXAMINATION						
4	CO-4: Applying the significance of Time Series data in various fields [K3]	**UNIT–IV: Time Series**				
		4.1	Introduction to Time series	T1, T2, R1	1	Chalk & Talk, PPT.
		4.2	Significance of Time series analysis	T1, T2, R1	1	Chalk & Talk
		4.3	Components of Time series	T1, T2, R1	1	Chalk & Talk Students Seminars
		4.4	Secular trend: Graphic method	T1, T2, R1	1	Chalk & Talk, Tutorials
		4.5	Semi-average method	T1, T2, R1	1	Chalk & Talk, Tutorials
		4.6	Method of moving averages	T1, T2, R1, R4	1	Chalk & Talk
		4.7	Method of least squares	T1, T2, R1, R2	1	Chalk & Talk
		4.8	straight line and non-linear trends	T1, T2, R1, R3	1	Chalk & Talk PPT
		4.9	Logarithmic methods – Exponential trends	T1, T2, R1, R3		Chalk & Talk
		4.10	Growth curves	T1, T2, R1, R4	1	Chalk & Talk NPTEL
		4.11	Seasonal Variations: Method of simple averages, Ratio-to-trend method	T1, T2, R1, R2	1	Chalk & Talk
		4.12	Ratio-to-trend method, ratio-to-moving average method, Link relative method.	T1, T2,R1, R4	1	Chalk & Talk PPT
		UNIT–V: Logistic Regression				
		5.1	Introduction to Logistic Regression	T1, T2, R1	1	Chalk & Talk PPT
		5.2	The classification problem	T1, T2, R1	1	Chalk & Talk, Tutorials
		5.3	The classification problem	T1, T2, R1		Chalk & Talk

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5	CO-5: Understanding the classification using Logistic Regression [K2]	5.4	Logistic Regression Setup	T1, T2, R1	1	Chalk & Talk
		5.5	Logistic Regression Setup	T1, T2, R1	1	Chalk & Talk
		5.6	Interpreting the Results	T1, T2,R1, R3	1	Chalk & Talk PPT
		5.7	Interpreting the Results	T1, T2,R1, R3,R4	1	Chalk & Talk
		5.8	Comparing Models	T1, T2,R1, R3	1	Chalk & Talk Student Seminars
		5.9	Comparing Models	T1, T2,R1, R2,R4	1	Chalk & Talk Student Seminars
		5.10	Classification Using Logistic Regression	T1, T2,R1, R2	1	Chalk & Talk PPT
		5.11	Classification Using Logistic Regression	T1, T2,R1, R3	1	Chalk & Talk
		5.12	Classification Using Logistic Regression	T1, T2,R1, R3	1	Chalk & Talk
			MID-II EXAMINATION			
TOTAL:60						

Text Books:

1. Elizabeth Purdom, "Statistical methods for Data science"
2. K.Murugesan, P.Gurusamy , "Probability, Statistics and Random Processes"

Refrences:

1. Manoj Kumar Srivastava and Namita Srivastava, Statistical Inference – Testing of Hypotheses, Prentice Hall of India, 2014.
2. Robert V Hogg, Elliot A Tannis and Dale L.Zimmerman, Probability and Statistical Inference,9th edition, Pearson publishers,2013.
3. Chris Chatfield, "The analysis of time series an introduction," 5th edition, Chapman & Hall/CRC.
4. Peter J. Brockwell, Richard A.Davis, "Introduction to Time series and Forecasting," Second edition, Springer

WEB SOURCE REFERENCES:

1	https://www.datacamp.com/blog/data-visualization-techniques
2	https://www.analytixlabs.co.in/blog/parametric-and-non-parametric-test/
3	https://www.youtube.com/watch?v=IWICWbhaem8
4	https://www.simplilearn.com/tutorials/statistics-tutorial/what-is-time-series-analysis
5	https://www.youtube.com/watch?v=z9XAXXGwUzM&t=560s

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DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2201	Probability and Statistics	II-II	CSE(AI-ML)	5	A,B

Course Outcomes:

After completion of this course, the students would be able to:

CO221.1	Classify the concept of data science and its importance	(K2)
CO221.2	Interpret the association of characteristics and through correlation and regression tools	(K4)
CO221.3	Apply discrete and continuous probability distributions	(K3)
CO221.4	Design the components of a classical hypothesis test	(K6)
CO221.5	Infer the statistical internal methods based on small and large sample tests	(K4)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO-1: Classify the concept of data science and its importance (K2).		**UNIT-I : Descriptive Statistics and methods for data science**			
		1.1	Introduction to Data science	T1, T2, R1	1	Chalk & Talk PPT
		1.2	Population Vs sample, collection of Data	T1, T2, R1	1	Chalk & Talk
		1.3	Types of Variables	T1, T2, R1	1	Chalk & Talk
		1.4	Data Visualization charts	T1, T2, R2	1	Chalk & Talk
		1.5	Mean, median,, mode	T1, T2, R1	1	Chalk & Talk
		1.6	Geometric mean, Harmonic mean	T1, T2, R1	1	Chalk & Talk
		1.7	Range, variance,	T1, T2, R1	1	Chalk & Talk
		1.8	Mean & deviation	T1, T2, R1	1	Chalk & Talk
		1.9	Skewness	T1, T2, R1	1	Chalk & Talk
		1.10	Skewness	T1, T2, R1	1	Chalk & Talk Student seminar
		1.11	kurtosis	T1, T2, R1	1	Chalk & Talk
		1.12	kurtosis	T1, T2, R1	1	Chalk & Talk
			ASSIGNMENT-I EXAMINATION			
2	CO-2: Interpret the association of characteristics and through correlation and regression tools (K4).		**UNIT – II: CORRELATION AND CURVE FITTING**			
		2.1	Types of correlation	T1, T2,R1	1	Chalk & Talk PPT
		2.2	Coefficient of correlation	T1, T2,R1	1	Chalk & Talk,
		2.3	Rank correlation coefficient	T1, T2,R1	1	Chalk & Talk,
		2.4	Regression Coefficient and Regression Equation	T1, T2,R1	1	Chalk & Talk NPTEL
		2.5	Fitting a straight Line-Method of least squares	T1, T2,R1	1	Chalk & Talk
		2.6	Fitting a straight Line-Method of least squares	T1, T2,R1	1	Chalk & Talk
		2.7	Fitting a Parabola	T1, T2,R1	1	Chalk & Talk
		2.8	Fitting a Parabola	T1, T2,R1	1	Chalk & Talk

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		2.9	Fitting a Exponential curve	T1, T2,R2	1	Chalk &
		2.10	Fitting a Exponential curve	T1, T2,R2	1	Chalk &
		2.11	Fitting a Power Curve	T1, T2,R1	1	Chalk & Student seminar
		2.12	Fitting a Power Curve	T1, T2,R1	1	Chalk & Talk
		MID-I EXAMINATION				
3	CO-3: Apply discrete and continuous probability distributions (K3).	**UNIT-III :Probability Distributions**				
		3.1	Introduction to Probability	T1, T2, R1	1	Chalk & Talk PPT
		3.2	Conditional Probability, baye's theorem	T1, T2, R1	1	Chalk & Talk
		3.3	Discrete Random Variables	T1, T2, R1	1	Chalk & Talk,
		3.4	Continuous Random variables	T1, T2, R3	1	Chalk & Talk,
		3.5	Distribution function	T1, T2, R1	1	Chalk & Talk
		3.6	Mathematical expectation	T1, T2, R1	1	Chalk & Talk, NPTEL
		3.7	variance	T1, T2, R1	1	Chalk & Talk
		3.8	Binomial distribution	T1, T2, R3	1	Chalk & Talk Student seminar
		3.9	Poisson and uniform distribution	T1, T2, R1	1	Chalk & Talk
		3.10	Poisson and uniform distribution	T1, T2, R1	1	Chalk & Talk
		3.11	Normal Distribution	T1, T2, R1	1	Chalk & Talk
		3.12	Normal Distribution	T1, T2, R1	1	Chalk & Talk
		ASSIGNMENT-II EXAMINATION				
4	CO-4: Design the components of a classical hypothesis test (K6).	**UNIT-IV :SAMPLING THEORY**				
		4.1	Introduction Sampling Theory	T1, T2,R1	1	Chalk & Talk, PPT
		4.2	Population Vs sample	T1, T2,R1	1	Chalk & Talk
		4.3	Sampling distribution of means, variances	T1, T2,R1	1	Chalk & Talk
		4.4	Central Limit theorem	T1, T2,R1	1	Chalk & Talk
		4.5	Introduction to t distribution	T1, T2,R1	1	Chalk & Talk
		4.6	Introduction to F Distribution	T1, T2,R1	1	Chalk & Talk
		4.7	Introduction to F Distribution	T1, T2,R1	1	Chalk & Talk
		4.8	Introduction to Chi-Square Distributions	T1, T2,R2	1	Chalk & Talk
		4.9	Introduction to Chi-Square Distributions	T1, T2,R2	1	Chalk & Talk
		4.10	Point Estimation	T1, T2,R1	1	Chalk & Talk,
		4.11	Interval Estimation	T1, T2,R1	1	Chalk & Talk Student seminar
		4.12	Maximum error of estimate	T1, T2,R1	1	Chalk & Talk
5	CO-5: Infer the statistical internal methods based on small and large sample tests (K4).	**UNIT-V : TESTING OF HYPOTHESIS**				
		5.1	Introduction to Tests of Hypothesis	T1, T2, R1	1	Chalk & Talk, PPT
		5.2	Formulation of Null Hypothesis, critical region, level of significance	T1, T2,R1	1	Chalk & Talk
		5.3	One Tail, Two tailed Tests Type-I, and Type-II errors	T1, T2,R1	1	Chalk & Talk Tutorial
		5.4	Large sample test -single mean	T1, T2,R1	1	Chalk & Talk
		5.5	Large sample test -,two means	T1, T2,R1	1	Chalk & Talk
		5.6	Large sample test -single proportion	T1, T2,R1	1	Chalk & Talk
		5.7	Large sample test -Double proportion	T1, T2,R1	1	Chalk & Talk

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5.8	Small samples-Students t Test	T1, T2,R1	1	Chalk & Talk
5.9	F-Test	T1, T2,R4	1	Chalk & Talk, web resources
5.10	F-Test	T1, T2,R4	1	Chalk & Talk, web resources
5.11	Chi Square Test	T1, T2,R1	1	Chalk & Talk Student seminar
5.12	Chi Square Test	T1, T2,R1	1	Chalk & Talk
	MID-II EXAMINATION			
				TOTAL:60

Text Books:

1. Miller and Freund's, "Probability and Statistics for Engineers",7/e, Pearson, 2008.
2. S. C. Gupta and V.K. Kapoor, "Fundamentals of Mathematical Statistics", 11/e, Sultan Chand & Sons Publications, 2012.

References:

1.Shron L. Myers, Keying Ye, Ronald E Walpole, Probability and Statistics Engineers and the Scientists,8th Edition, Pearson 2007.
2. Jay l. Devore, Probability and Statistics for Engineering and the Sciences, 8 th Edition, cengage.
3. Sheldon M. Ross, "Introduction to probability and statistics Engineers and the Scientists", 4 th Edition, Academic Foundation, 2011.
4.Johannes Ledolter and Robert V. Hogg, "Applied statistics for Engineers and Physical Scientists", 3 rd Edition, Pearson, 2010.

WEB SOURCE REFERENCES:

1	https://archive.nptel.ac.in/courses/111/105/111105090/
2	https://onlinecourses.nptel.ac.in/noc21_ma74/preview
3	https://archive.nptel.ac.in/courses/111/106/111106112/
4	https://archive.org/details/NPTEL-Math-Probability_and_Statistics
5	https://onlinecourses.nptel.ac.in/noc22_ma81/preview

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DEPARTMENT OF CSE (AIML), CSE (CS), CSE (DS), AIML
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC22MC	ENVIRONMENTAL STUDIES (R23)	II- II	CSE (DS)	2	A

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO:1 Understand multi-disciplinary nature of environmental studies and Analyze the natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources.(K2)	**Unit-1. Multidisciplinary nature of Environmental Studies**				
		1.1	Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.	T1, T2, R1	1	Chalk& Talk
		1.2	Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems	T1, T2, R1	1	Chalk& Talk
		1.3	Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction	T1, T2, R1	2	Active learning & PPT
		1.4	Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems	T1	2	PPT
		1.5	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.	T1, T2, R1	1	Active learning & PPT
2	CO2: Explain the concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web. Explain the biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity. (K2)	**Unit-2. Ecosystems**				
		2.1	Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession mining, dams and effects on forest and tribal people.	T1, T2, R3	2	Active learning & PPT
		2.2	Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:	T1, T2, R3	2	PPT & Case Study
		2.3	a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem	T1, T2, R3	1	Chalk& Talk
		2.4	d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) Biodiversity and Its Conservation : Introduction and Definition: genetic, species and ecosystem diversity.	T1, T2, R3	1	Chalk& Talk

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		2.5	Bio-geographical classification of India Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values	T1	1	Chalk
		2.6	Biodiversity at global, National and local levels – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts	T1, T2, R1	1	Chalk& Talk
3	CO3: Distinguish various attributes of the pollution, their impacts and measures to reduce or control the pollution along with waste management(K2)	**Unit-3. Environmental Pollution:**				
		3.1	Environmental Pollution: Definition, Cause, effects and control measures of: a. Air Pollution.	T1, T2, R1	1	Chalk& Talk
		3.2	Definition, Cause, effects and control measures of: b.Water pollution c.Soil pollution	T1, T2, R1	1	Chalk& Talk
		3.3	d.Marine pollution e.Noise pollution	T1, T2, R1	1	Active learning & PPT
		3.4	Solid Waste Management: Causes, effects and control measures of urban and industrial wastes	T1, T2, R1	1	PPT
		3.5	Role of an individual in prevention of pollution – Pollution case studies	T1, T2, R1	1	Tutorial
		3.6	Disaster management: floods, earthquake, cyclone and landslides.	T1, T2, R1	1	Tutorial & PPT
4	CO4: Understand the rainwater harvesting, watershed management, and ozone layer depletion and waste land reclamation. (K2))	**Unit-4.** Social Issues and the Environment:				
		4.1	Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershedmanagement	T1, T2, R3	2	Chalk& Talk, Industrial Visit
		4.2	Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies	T1, T2, R3	2	PPT
		4.3	Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act	T1, T2, R3	2	Chalk& Talk, Case Study
		4.4	Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.	T1, T2, R3	1	Tutorial, PPT
5	CO 5: Illustrate the causes of population explosion, value education and welfare programmes. (K3).	**Unit 5.** Human Population And The Environment:				
		5.1	Population growth, variation among nations. Population explosion	T1, T2, R3	1	PPT, Chalk& Talk
		5.2	Family Welfare Programmes. – Environment and human health	T1, T2, R3 T1	1	PPT Active learning & PPT
		5.3	Human Rights – Value Education – HIV/AIDS	T1, T2, R3	1	Case Study & PPT
		5.4	Women and Child Welfare	T1, T2, R1	1	Chalk& Talk
		5.5	Role of information Technology in Environment and human health – Case studies	T1, T2, R1	1	Chalk& Talk

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			3/8th rule			PPT
2	numerical integral techniques to different Engineering problems. Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations (K3).	2.2	Trapezoidal rule, Simpson's 1/3rd and 3/8th rule	T1, T2, R1	1	Chalk & Talk
		2.3	Solution of initial value problems by Taylor's series	T1, T2, R1	1	Chalk & Talk
		2.4	Solution of initial value problems by Taylor's series	T1, T2, R1	1	Chalk & Talk
		2.5	Picard's method of successive approximations	T1, T2, R1	1	Chalk & Talk
		2.6	Picard's method of successive approximations	T1, T2,R1	1	PPT
		2.7	Euler's method	T1, T2, R1, R2	1	Chalk & Talk
		2.8	Euler's method	T1, T2, R1. R3	1	Chalk & Talk, PPT
		2.9	Runge - Kutta method (second and fourth order)	T1, T2, R1, R2	1	Chalk & Talk
		2.10	Runge - Kutta method (second and fourth order)	T1, T2, R1	1	Chalk & Talk Students Seminars
		2.11	Milne's Predictor and Corrector Method	T1, T2, R1, R3	1	Chalk & Talk, Tutorials
		2.12	Milne's Predictor and Corrector Method	T1, T2, R1	1	Chalk & Talk
			MID-I EXAMINATION			
3	**CO3:** Apply the Laplace transform for solving differential equations (K3).		**UNIT – III: LAPLACE TRANSFORMS**			
		3.1	Definition of Laplace transform	T1, T2, R1, R3	1	Chalk & Talk, PPT.
		3.2	Laplace transforms of standard functions	T1, T2, R1, R2	1	Chalk & Talk
		3.3	Properties of Laplace Transforms	T1, T2, R1, R2	1	PPT.
		3.4	Shifting theorems	T1, T2, R1, R3	1	Chalk & Talk
		3.5	Transforms of derivatives and integrals	T1, T2, R1	1	Chalk & Talk
		3.6	Unit step function, Dirac's delta function	T1, T2, R1, R2	1	Chalk & Talk
		3.7	Inverse Laplace transforms	T1, T2, R1	1	Chalk & Talk
		3.8	Inverse Laplace transforms	T1, T2, R1	1	Chalk & Talk PPT
		3.9	Convolution theorem (without proof)	T1, T2, R1, R3	1	Chalk & Talk Tutorials
		3.10	Convolution theorem (without proof)	T1, T2, R1, R3	1	Chalk & Talk
		3.11	Applications: Solving ordinary differential equations (initial value problems) and integral differential equations using Laplace transforms.	T1, T2, R1, R3	1	Chalk & Talk PPT
		3.12	Applications: Solving ordinary differential equations (initial value problems) and integral differential equations using Laplace transforms.	T1, T2, R1, R2	1	Chalk & Talk
4			**UNIT–IV: FOURIER SERIES**			

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Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2110	NUMERICAL METHODS & TRANSFORM TECHNIQUES	II-I	ME	5	-

CO1: Evaluate the approximate roots of polynomial and transcendental equations by different algorithms. Apply Newton's forward and backward and Lagrange's formulae for equal and unequal intervals (K3).
CO2: Apply numerical integral techniques to different Engineering problems. Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations (K3).
CO3: Apply the Laplace transform for solving differential equations (K3).
CO4: Find or compute the Fourier series of periodic signals (K3).
CO5: Know and be able to apply integral expressions for the forwards and inverse Fourier transform to a ge of non-periodic waveforms (K3).

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT – I: ITERATIVE METHODS			
1	**CO1**: Evaluate the approximate roots of polynomial and transcendental equations by different algorithms. Apply Newton's forward and backward and Lagrange's formulae for equal and unequal intervals (K3).	1.1	Introduction	T1, T2, R1	1	Chalk & Talk, PPT
		1.2	Solutions of algebraic and transcendental equations: Bisection method	T1, T2, R1	1	Chalk & Talk
		1.3	Secant method	T1, T2, R1	1	Chalk & Talk
		1.4	Method of false position	T1, T2, R1	1	Chalk & Talk, PPT
		1.5	Method of false position	T1, T2, R1	1	Chalk & Talk
		1.6	General Iteration method	T1, T2, R1	1	Chalk & Talk
		1.7	General Iteration method	T1, T2, R1, R2	1	Chalk & Talk, PPT
		1.8	Newton-Raphson method (Simultaneous Equations)	T1, T2, R1	1	Chalk & Talk PPT
		1.9	Newton-Raphson method (Simultaneous Equations)	T1, T2, R1	1	Chalk & Talk
		1.10	Interpolation: Newton's forward and backward formulae for interpolation with unequal intervals,	T1, T2, R1	1	Chalk & Talk
		1.11	Lagrange's interpolation formula.	T1, T2, R1, R2	1	Tutorials
		1.12	Lagrange's interpolation formula.	T1, T2, R3	1	Chalk & Talk
			ASSIGNMENT-I EXAMINATION			
			UNIT – II: NUMERICAL INTEGRATION & SOLUTIONS OF O.D.E.			
	CO2: Apply	2.1	Trapezoidal rule, Simpson's 1/3rd and	T1, T2,R1	1	Chalk & Talk,

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	CO4: Find or compute the Fourier series of periodic signals (K3).	4.1	Introduction	T1, T2, R1	1	Chalk & Talk, PPT.
		4.2	Periodic functions	T1, T2, R1	1	Chalk & Talk
		4.3	Fourier series of periodic function	T1, T2, R1	1	Chalk & Talk Students Seminars
		4.4	Fourier series of periodic function	T1, T2, R1, R4	1	Chalk & Talk, Tutorials
		4.5	Dirichlet's conditions	T1, T2, R1	1	Chalk & Talk, Tutorials
		4.6	Even and odd functions	T1, T2, R1, R4	1	Chalk & Talk
		4.7	Even and odd functions	T1, T2, R1, R2	1	Chalk & Talk
		4.8	Change of interval	T1, T2, R1, R4	1	Chalk & Talk PPT
		4.9	Change of interval	T1, T2, R1, R2	1	Chalk & Talk
		4.10	Half-range sine and cosine series	T1, T2, R1, R2	1	Chalk & Talk
		4.11	Half-range sine and cosine series	T1, T2,R1, R3	1	Chalk & Talk PPT
		4.12	Half-range sine and cosine series	T1, T2,R1, R3	1	Chalk & Talk PPT
	ASSIGNMENT-II EXAMINATION					
		UNIT – V: FOURIER TRANSFORMS				
5	**CO5:** Know and be able to apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms (K3).	5.1	Fourier integral theorem (without proof)	T1, T2, R1	1	Chalk & Talk PPT
		5.2	Fourier sine and cosine integrals	T1, T2, R1	1	Chalk & Talk, Tutorials
		5.3	Fourier sine and cosine integrals	T1, T2, R1	1	Chalk & Talk
		5.4	Infinite Fourier transforms	T1, T2, R1	1	Chalk & Talk
		5.5	Infinite Fourier transforms	T1, T2, R1	1	Chalk & Talk
		5.6	Sine and cosine transforms	T1, T2,R1, R3	1	Chalk & Talk PPT
		5.7	Properties	T1, T2,R1, R3	1	Chalk & Talk
		5.8	Inverse transforms	T1, T2,R1, R4	1	Chalk & Talk
		5.9	Convolution theorem (without proof)	T1, T2,R1, R2	1	Chalk & Talk
		5.10	Convolution theorem (without proof)	T1, T2,R1, R2	1	Chalk & Talk PPT
		5.11	Finite Fourier transforms	T1, T2,R1, R4	1	Chalk & Talk
		5.12	Finite Fourier transforms	T1, T2,R1, R4	1	Chalk & Talk
			MID-II EXAMINATION			
						TOTAL:60

Text Books:

1. B. S. Grewal, Higher Engineering Mathematics, 44th Edition, Khanna Publishers.
2. B. V. Ramana,Higher Engineering Mathematics, 2007 Edition, Tata Mc. Graw Hill Education.

Refrences:

1. Erwin Kreyszig,Advanced Engineering Mathematics, 10th Edition, Wiley-India.
2. Steven C. Chapra, Applied Numerical Methods with MATLAB for Engineering and

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Science,Tata Mc. Graw Hill Education.
3. M. K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Publications.
4. Lawrence Turyn,Advanced Engineering Mathematics, CRC Press.

WEB SOURCE REFERENCES:

1	https://nptel.ac.in/courses/111107056/module2/lecture6/lecture6.pdf
2	https://nptel.ac.in/courses/122101003/downloads/Lecture-27.pdf https://nptel.ac.in/courses/115103036/module6/lec39.pdf https://nptel.ac.in/courses/111107056/module6/lecture5/lecture5.pdf https://nptel.ac.in/courses/115103036/module6/lec38.pdf
3	https://www.digimat.in/nptel/courses/video/111107105/L01.html
4	https://nptel.ac.in/courses/122/102/122102009/
5	http://www.nptelvideos.in/2012/11/numerical-methods-and-computation.html

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DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23ME2103	THEMODYNAMICS	II-I	Mechanical Engineering	6	A

SNO	Course Outcome Statement
CO1	**Explain** the importance of thermodynamic properties related to conversion of heat energy into work.
CO2	**Apply** the Zeroth and First Law of Thermodynamics.
CO3	**Analyze** the Second Law of Thermodynamics.
CO4	**Analyze** the Mollier charts, T-S and h-s diagrams, Steam calorimetry, Phase Transformations
CO5	**Evaluate** the COP of refrigerating systems and properties, processes of psychrometry and sensible and latent heat loads.

Unit No	Outcome		Topics/Activity	Ref. Text book	Periods	Delivery Method
1	CO1 **Explain** the importance of thermodynamic properties related to conversion of heat energy into work.		**UNIT-1: BASIC CONCEPTS AND DEFINITIONS**			
		1.1	Thermodynamic fundamentals and Introduction	T1, T2&R2	2	Chalk & Talk PPT
		1.2	Types of Systems, Macroscopic and Microscopic viewpoints	T1, T2&R2	2	Chalk & Talk
		1.3	Concept of Continuum, Thermodynamic Equilibrium,	T1, T2&R2	2	Chalk & Talk
		1.4	State, Property, Process, Cycle ,Reversibility	T1, T2&R2	2	Chalk & Talk
		1.5	Quasi static Process, Irreversible Process, Causes of Irreversibility	T1, T2&R2	2	PPT
		1.6	Problems on work done	T1, T2&R2	2	Chalk & Talk
2	CO2. **Apply** the Zeroth and First Law of Thermodynamics.		**UNIT 2: FIRST LAW OF TD**			
		2.1	Energy in State and in Transition, Types, Work and Heat, Point and Path function	T1, T2&R2	2	Chalk & Talk
		2.2	Zeroth Law of Thermodynamics – PMM-I, Joule's Experiment	T1, T2&R2	2	Chalk & Talk
		2.3	First law of Thermodynamics and applications. Limitations of the First Law	T1, T2&R2	2	Chalk & Talk
		2.4	First law for flow systems - Steady flow energy equation – Enthalpy	T1, T2&R2	2	Chalk & Talk
		2.5	Problems on Internal energy and Enthalpy	T1, T2&R2	2	Chalk & Talk
		2.6	Thermal Reservoir, Heat Engine, Heat pump, Parameters of performance	T1, T2&R2	2	Chalk & Talk
	CO 3.		**UNIT 3: SECOND LAW OF THERMODYNAMICS**			
		3.1	Second Law of Thermodynamics, Kelvin-Planck and Clausius Statements and their Equivalence / Corollaries, PMM-II	T1, T2&R2	1	Chalk & Talk, PPT
		3.2	Carnot's principle, Carnot cycle and its specialties, Thermodynamic scale of Temperature	T1, T2&R2	1	Chalk & Talk, PPT
		3.3	Problems on Carnot Engines, Entropy	T1, T2&R2	2	Chalk & Talk

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3	**Analyze** the Second Law of Thermo dynamics.		problems			
		3.4	Clausius Inequality, Entropy, Principle of Entropy Increase – Energy Equation	T1, T2&R2	2	Chalk & Talk, PPT
		3.5	Availability and Irreversibility – Thermodynamic Potentials	T1, T2&R2	2	Chalk & Talk
		3.6	Gibbs and Helmholtz Functions, Maxwell Relations	T1, T2&R2	2	Chalk & Talk
		3.7	Elementary Treatment of the Third Law of Thermodynamics	T1, T2&R2	2	Chalk & Talk
MID I EXAMINATION DURING SEVENTH WEEK						
		UNIT-4: PURE SUBSTANCES				
4	CO 4. **Analyze** the Mollier charts, T-S and h-s diagrams, Steam calorimetry, Phase Transformations	4.1	vapour-liquid-solid phase equilibrium in a pure substance Pure Substances, P-V-T-surfaces, T-S and h-s diagrams	T1, T2&R2	2	Chalk & Talk
		4.2	Mollier Charts, Phase Transformations – Triple point at critical state properties during change of phase	T1, T2&R2	2	Chalk & Talk
		4.3	Dryness Fraction – Clausius – Clapeyron Equation Property tables	T1, T2&R2	2	Chalk & Talk
		4.4	Tables of thermodynamic properties, thermodynamic surfaces	T1, T2&R2	2	Chalk & Talk, PPT
		4.5	Mollier charts – Various Thermodynamic processes and energy Transfer	T1, T2&R2	2	Chalk & Talk
		4.6	Steam Calorimetry.	T1, T2&R2	2	Chalk & Talk
		UNIT 5: POWER CYCLES				
5	CO 5. **Evaluate** the COP of refrigerating systems and properties, processes of psychrometry and sensible and latent heat loads	5.1	Introduction to Refrigeration: working of Air, Vapor Compression	T1, T2&R2	2	Chalk & Talk, PPT
		5.2	VCR system Components, COP Refrigerants.	T1, T2&R2	2	Chalk & Talk
		5.3	Introduction to Air Conditioning: Psychrometric properties & processes	T1, T2&R2	2	Chalk & Talk
		5.4	characterization of sensible and latent heat loads – load concepts of SHF	T1, T2&R2	2	Chalk & Talk
		5.5	Requirements of human comfort and concept of effective temperature- comfort chart	T1, T2&R2	2	Chalk & Talk, PPT
		5.6	comfort air conditioning, and load calculations.	T1, T2&R2	2	Chalk & Talk
				Total	**60**	
MID II EXAMINATION DURING FOURTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS	
T1	P.K. Nag, Engineering Thermodynamics, 6/e, Tata McGraw Hill, 2017.
T2	Claus Borgnakke Richard E. Sonntag, Fundamentals of Thermodynamics, 10/e, Wiley, 2020.
REFERENCE BOOKS	
R1	J.B. Jones, and R.E. Dugan, Engineering Thermodynamics, 1/e, Prentice Hall, 1995.
R2	Y.A. Cengel & M.A. Boles, Thermodynamics – An Engineering Approach, 7/e, McGraw Hill, 2010.
R3	P. Chattopadhyay, Engineering Thermodynamics, 1/e, Oxford University Press, 2011.
R4	CP Arora, Refrigeration and Air-conditioning, 4/e, McGraw Hill, 2021.

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DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/ Week	Sections
R23ME2105	Material Science and Metallurgy	II-I	ME	4	A

COURSE OUTCOMES: Students are able to

S. No.	Course Outcome Statement
CO1	**Analyze** the crystalline structure of different metals and study the stability of phases in different alloy systems.
CO2	**Identify** the behavior of ferrous and non-ferrous metals and alloys and their application in different domains.
CO3	**Analyze** the effect of heat treatment, addition of alloying elements on properties of ferrous metals.
CO4	**Analyze** the methods of making of metal powders and applications of powder metallurgy.
CO5	**Inspect** the properties and applications of ceramic, composites and other advanced methods.

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1: **Analyze** the crystalline structure of different metals and study the stability of phases in different alloy systems.		**Unit-1 STRUCTURE OF METALS AND CONSTITUTION OF ALLOYS**			
		1.1	Ionic, Covalent and Metallic bonds; Amorphous and Crystalline solids. Crystallization of metals	T1, R1	2	Chalk & Talk
		1.2	Crystal structure - BCC, FCC, HCP, Packing Factor - SC, BCC, FCC& HCP-line density, plane density	T1, T2, R2	2	PPT
		1.3	Grain and grain boundaries, effect of grain boundaries-determination of grain size.	T1, R2	2	Chalk & Talk,Quiz
		1.4	Imperfections, Slip and Twinning, Necessity of alloying, types of solid solutions	T1, T2, R1	2	Chalk & Talk
		1.5	Hume Rothery's rules, intermediate alloy phases, and electron compounds.	T1, R1	2	PPT
		1.6	**EQUILIBRIUM DIAGRAMS:** Experimental methods of construction of equilibrium diagrams, Isomorphous alloy systems, equilibrium cooling and heating of alloys	T1, T2, R1	2	Chalk & Talk, Web Resources
		1.7	Lever rule, Gibbs Phase rule, coring miscibility gaps, eutectic systems, congruent melting intermediate phases, peritectic reaction.	T1, R1	2	Chalk & Talk

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		1.8	Transformations in the solid state – allotropy, eutectoid, peritectoid reactions, phase rule, relationship between equilibrium diagrams and properties of alloys.	T2, R1	2	Chalk & Talk
		1.9	Study of binary phase diagrams such as Cu-Ni and Fe-Fe_3C.	T1, R3	2	PPT
2	CO2: **Identify** the behavior of ferrous and non-ferrous metals and alloys and their application in different domains.	**Unit-2 FERROUS METALS AND ALLOYS**				
		2.1	Structure and properties of White Cast iron, Malleable Cast iron,	T1, T2, R1	2	PPT
		2.2	Structure and properties of grey cast-iron, Spheroidal graphite cast-iron	T1, T2, R1	2	PPT
		2.3	Alloy cast-iron	T2, R2	2	Chalk & Talk
		2.4	Classification of steels, structure and properties of plain carbon steels, Low alloy steels	T2, R2	2	PPT, Quiz
		2.5	Hadfield manganese steels, tool and die steels	T2, R2	2	Chalk & Talk
		2.6	NON-FERROUS METALS AND ALLOYS: Structure and properties of Copper and its alloys,	T1, T2, R1	2	Chalk & Talk, Web Resources
		2.7	Aluminum and its alloys, Titanium and its alloys, Magnesium and its alloys, Super alloys.	T1,T2,R2	2	Chalk & Talk, Quiz
		MID I EXAMINATIONS				
		Unit-3 HEAT TREATMENT OF ALLOYS				
3	**CO3: Analyze** the effect of heat treatment, addition of alloying elements on properties of ferrous metals.	3.1	Effect of alloying elements on Fe-Fe3C system	T1, T2, R2	2	Chalk & Talk, Student Seminars
		3.2	annealing, normalizing, hardening,	T1, R2	2	PPT
		3.3	TTT diagrams, tempering, hardenability	T1, T2, R2	3	Chalk & Talk, Case study
		3.4	surface - hardening methods,	T1,T2,R2	2	Chalk & Talk
		3.5	Age hardening treatment, Cryogenic treatment.	T1,R2	2	Chalk & Talk
4	**CO4: Analyze** the methods of making of metal powders and applications of powder metallurgy.	**Unit-4 POWDER METALLURGY**				
		4.1	Basic processes- Methods of producing metal powders-	T1, R1	2	Chalk & Talk
		4.2	Milling atomization, Granulation-Reduction-	T1, T2, R1	3	Chalk & Talk
		4.3	Electrolytic Deposition Compacting methods –	T1, R1	3	Chalk & Talk, Quiz
		4.4	Sintering - Methods of manufacturing sintered parts.	T1, T2, R1	3	PPT
		4.5	Secondary operations, Applications of powder metallurgical products.	T1, T2, R4	2	Chalk & Talk
5	CO5: **Inspect** the properties	**Unit-5 CERAMIC AND ADVANCED MATERIALS**				
		5.1	Crystalline ceramics, glasses, cermets,	T1, T2,	2	Chalk &

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	and applications of ceramic, composites and other advanced methods		abrasive materials	R2		Talk, Students Seminars
		5.2	Classification of composites, manufacturing methods,	T1, T2, R2	3	Chalk & Talk
		5.3	particle reinforced composites, fiber reinforced composites	T1, R2	2	PPT
		5.4	fiber reinforced composites, PMC, MMC, CMC and CCCs.	T1, R2	2	Chalk & Talk, Quiz
		5.5	Introduction to Nano materials and smart materials.	T1, T2, R2	3	Chalk & Talk, NPTEL
				Total	**68**	
MID II EXAMINATIONS						
END EXAMINATIONS						

NPTEL Links:
https://archive.nptel.ac.in/courses/113/102/113102080/
https://www.digimat.in/nptel/courses/video/113102080/L01.html
https://www.digimat.in/nptel/courses/video/113107078/L01.html
MOOCS Links:
https://www.my-mooc.com/en/mooc/materials-science-and-engineering/
https://www.classcentral.com/course/edx-materials-science-and-engineering-8150
Multiple Choice Questions:
https://www.sanfoundry.com/1000-materials-science-questions-answers/
PPT Links:
https://slideplayer.com/slide/17365672/
https://www.slideserve.com/erling/materials-science-metallurgy

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	S.H.Avner, Introduction to Physical Metallurgy, 3/e, Tata McGraw- Hill, 2017.
T2	Donald R.Askeland, Essentials of Materials science and Engineering, 4/e, CL Engineering publications, 2018.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Dr. V.D.kodgire, Material Science and Metallurgy, 39/e, Everest Publishing House, 2017.
R2	V.Raghavan, Material Science and Engineering, 5/e, Prentice Hall of India, 2004.
R3	William D. Callister Jr, Materials Science and Engineering: An Introduction, 8/e, John Wiley and Sons, 2009.
R4	George E.Dieter, Mechanical Metallurgy, 3/e, McGraw-Hill, 2013.

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DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
-	UHV-2(R23)	II-I	MEC	3	

COURSE OUTCOMES: Student is able to

CO1: : Define the terms like Natural Acceptance, Happiness and Prosperity (K1)

CO2: Identify one's self, and one's surroundings (family, society nature) (K4)

CO3: Apply what they have learnt to their own self in different day-to-day settings in real life (K3)

CO4: Relate human values with human relationship and human society. (K6)

CO5: Justify the need for universal human values and harmonious existence (K5)

CO6: Develop as socially and ecologically responsible engineers(K6)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Define the terms like Natural Acceptance, Happiness and Prosperity		**Unit-1. Introduction to Value Education**			
		1.1	Right Understanding, Relationship and Physical Facility	T1,R1	1	Chalk & Talk
		1.2	Understanding Value Education	T1R1	1	Chalk & Talk,PPT
		1.3	Practice Session PS1 Sharing about Oneself (PS1)	T1, R1	1	Presentation by student
		1.4	Self-exploration as the Process for Value Education	T1,R1	1	Chalk & Talk
		1.5	Continuous Happiness and Prosperity – the Basic Human Aspirations	T1,R1	1	Chalk & Talk,PPT
		1.6	Practice Session PS2 Exploring Human Consciousness(PS2)	T1,R1	1	Presentation by student
		1.7	Happiness and Prosperity – Current Scenario	T1,R1	1	Chalk & Talk,PPT
		1.8	Method to Fulfill the Basic Human Aspirations	T1,R1	1	Chalk & Talk,PPT
		1.9	Practice Session PS3 Exploring Natural Acceptance(PS3)	T1,R1	1	Presentation by student
2	CO2: Identify one's self, and one's surroundings (family, society nature)		**Unit-2. Harmony in the Human Being**			
		2.1	Understanding Human being as the Co-existence of the self and the body.	T1, R1	1	Chalk & Talk
		2.2	Distinguishing between the Needs of the self and the body	T1, R1	1	Chalk & Talk

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		2.3	Practice Session PS4 Exploring the difference of Needs of self and body.(PS4)	T1, R1	1	Chalk & Talk,PPT
		2.4	The body as an Instrument of the self	T1, R1	1	Chalk & Talk
		2.5	Practice Session PS5 Exploring Sources of Imagination in the self (PS5)	T1, R1	1	Presentation by student
		2.6	Harmony of the self with the body	T1, R1	1	Chalk & Talk
		2.7	Programme to ensure self-regulation and Health	T1, R1	1	Chalk & Talk
		2.8	Session PS6 Exploring Harmony of self with the body	T1, R1	1	Presentation by student
3	CO3: Apply what they have learnt to their own self in different day-to-day settings in real life.		**Unit-3. Harmony in the Family and Society**			
		3.1	Harmony in the Family – the Basic Unit of Human Interaction	T1, R1	1	Chalk & Talk
		3.2	Trust' – the Foundational Value in Relationship	T1, R1	1	Chalk & Talk,PPT
		3.3	Practice Session PS7 Exploring the Feeling of Trust	T1, R1	1	Presentation by student
		3.4	Respect – as the Right Evaluation	T1, R1	1	Chalk & Talk
		3.5	Practice Session PS8 Exploring the Feeling of Respect	T1, R1	1	Presentation by student
		3.6	Other Feelings, Justice in Human-to-Human Relationship	T1, R1	1	Chalk & Talk
		3.7	Understanding Harmony in the Society	T1, R1	1	Chalk & Talk
		3.8	Vision for the Universal Human Order	T1, R1	1	Chalk & Talk
		3.9	Practice Session PS9 Exploring Systems to fulfil Human Goal	T1, R1	1	Presentation by student

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	5.6	Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain - Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.	T1, T2, R1	1	Chalk& Talk, Active Learning
			Total	**34**	

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Erach Bharucha,Textbook of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
T2	Palaniswamy, Environmental Studies, 2/e, Pearson education, 2014.
T3	S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.
T4	K.Raghavan Nambiar, "Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e,Cengage Publications, 2012.
R2	M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BSPublication, 2014.
R3	J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering,Prentice Hall of India Private limited, 1988.
R4	G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House,2018.
R5	Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineeringand Science, 1/e, Prentice Hall of India Private limited, 1991

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Narasaraopeta Engineering College
(Autonomous)
Yellamanda(Post), Narasaraopet- 522601

DEPARTMENT OF CSE (AIML), CSE (CS), CSE (DS), AIML
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC22MC	ENVIRONMENTAL STUDIES (R23)	II- II	CSE (AIML)	2	A,B

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO:1 Understand multi-disciplinary nature of environmental studies and Analyze the natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources.(K2)		**Unit-1. Multidisciplinary nature of Environmental Studies**			
		1.1	Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.	T1, T2, R1	1	Chalk& Talk
		1.2	Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems	T1, T2, R1	1	Chalk& Talk
		1.3	Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction	T1, T2, R1	2	Active learning & PPT
		1.4	Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems	T1	2	PPT
		1.5	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.	T1, T2, R1	1	Active learning & PPT
2	CO2: Explain the concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web. Explain the biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity. (K2)		**Unit-2. Ecosystems**			
		2.1	Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession mining, dams and effects on forest and tribal people.	T1, T2, R3	2	Active learning & PPT
		2.2	Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:	T1, T2, R3	2	PPT & Case Study
		2.3	a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem	T1, T2, R3	1	Chalk& Talk
		2.4	d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) Biodiversity and Its Conservation : Introduction and Definition: genetic, species and ecosystem diversity.	T1, T2, R3	1	Chalk& Talk

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		2.5	Bio-geographical classification of India Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values	T1	1	Chalk&
		2.6	Biodiversity at global, National and local levels – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts	T1, T2, R1	1	Chalk& Tal
3	CO3: Distinguish various attributes of the pollution, their impacts and measures to reduce or control the pollution along with waste management(K2)	**Unit-3. Environmental Pollution:**				
		3.1	Environmental Pollution: Definition, Cause, effects and control measures of: a. Air Pollution.	T1, T2, R1	1	Chalk& Talk
		3.2	Definition, Cause, effects and control measures of: b.Water pollution c.Soil pollution	T1, T2, R1	1	Chalk& Talk
		3.3	d.Marine pollution e.Noise pollution	T1, T2, R1	1	Active learning & PPT
		3.4	Solid Waste Management: Causes, effects and control measures of urban and industrial wastes	T1, T2, R1	1	PPT
		3.5	Role of an individual in prevention of pollution – Pollution case studies	T1, T2, R1	1	Tutorial
		3.6	Disaster management: floods, earthquake, cyclone and landslides.	T1, T2, R1	1	Tutorial & PPT
4	CO4: Understand the rainwater harvesting, watershed management, and ozone layer depletion and waste land reclamation. (K2))	**Unit-4.** Social Issues and the Environment:				
		4.1	Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershedmanagement	T1, T2, R3	2	Chalk& Talk, Industrial Visit
		4.2	Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies	T1, T2, R3	2	PPT
		4.3	Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act	T1, T2, R3	2	Chalk& Talk, Case Study
		4.4	Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.	T1, T2, R3	1	Tutorial, PPT
5	CO 5: Illustrate the causes of population explosion, value education and welfare programmes. (K3).	**Unit 5.** Human Population And The Environment:				
		5.1	Population growth, variation among nations. Population explosion	T1, T2, R3	1	PPT, Chalk& Talk
		5.2	Family Welfare Programmes. – Environment and human health	T1, T2, R3 T1	1	PPT Active learning & PPT
		5.3	Human Rights – Value Education – HIV/AIDS	T1, T2, R3	1	Case Study & PPT
		5.4	Women and Child Welfare	T1, T2, R1	1	Chalk& Talk
		5.5	Role of information Technology in Environment and human health – Case studies.	T1, T2, R1	1	Chalk& Talk

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		5.6	Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.	T1, T2, R1	1	Chalk& Talk, Active Learning
				Total	34	

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Erach Bharucha,Textbook of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
T2	Palaniswamy, Environmental Studies, 2/e, Pearson education, 2014.
T3	S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.
T4	K.Raghavan Nambiar, "Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010. .

REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e,Cengage Publications, 2012.
R2	M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BSPublication, 2014.
R3	J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering,Prentice Hall of India Private limited, 1988.
R4	G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House,2018.
R5	Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineeringand Science, 1/e, Prentice Hall of India Private limited, 1991

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NARASARAOPETA ENGINEERING COLLEGE
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DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2201	Probability and Statistics	II-II	AIML	5	A

Course Outcomes:

After completion of this course, the students would be able to:

CO221.1	Classify the concept of data science and its importance	(K2)
CO221.2	Interpret the association of characteristics and through correlation and regression tools	(K4)
CO221.3	Apply discrete and continuous probability distributions	(K3)
CO221.4	Design the components of a classical hypothesis test	(K6)
CO221.5	Infer the statistical internal methods based on small and large sample tests	(K4)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT-I : Descriptive Statistics and methods for data science			
1	CO-1: Classify the concept of data science and its importance (K2).	1.1	Introduction to Data science	T1, T2, R1	1	Chalk & Talk PPT
		1.2	Population Vs sample, collection of Data	T1, T2, R1	1	Chalk & Talk
		1.3	Types of Variables	T1, T2, R1	1	Chalk & Talk
		1.4	Data Visualization charts	T1, T2, R2	1	Chalk & Talk
		1.5	Mean, median,, mode	T1, T2, R1	1	Chalk & Talk
		1.6	Geometric mean, Harmonic mean	T1, T2, R1	1	Chalk & Talk
		1.7	Range, variance,	T1, T2, R1	1	Chalk & Talk
		1.8	Mean & deviation	T1, T2, R1	1	Chalk & Talk
		1.9	Skewness	T1, T2, R1	1	Chalk & Talk
		1.10	Skewness	T1, T2, R1	1	Chalk & Talk Student seminar
		1.11	kurtosis	T1, T2, R1	1	Chalk & Talk
		1.12	kurtosis	T1, T2, R1	1	Chalk & Talk
			ASSIGNMENT-I EXAMINATION			
2	CO-2: Interpret the association of characteristics and through correlation and regression tools (K4).		**UNIT – II: CORRELATION AND CURVE FITTING**			
		2.1	Types of correlation	T1, T2,R1	1	Chalk & Talk PPT
		2.2	Coefficient of correlation	T1, T2,R1	1	Chalk & Talk,
		2.3	Rank correlation coefficient	T1, T2,R1	1	Chalk & Talk,
		2.4	Regression Coefficient and Regression Equation	T1, T2,R1	1	Chalk & Talk NPTEL
		2.5	Fitting a straight Line-Method of least squares	T1, T2,R1	1	Chalk & Talk
		2.6	Fitting a straight Line-Method of least squares	T1, T2,R1	1	Chalk & Talk
		2.7	Fitting a Parabola	T1, T2,R1	1	Chalk & Talk

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		2.8	Fitting a Parabola	T1, T2,R1	1	Chalk & Ta
		2.9	Fitting a Exponential curve	T1, T2,R2	1	Chalk & Talk
		2.10	Fitting a Exponential curve	T1, T2,R2	1	Chalk & Talk,
		2.11	Fitting a Power Curve	T1, T2,R1	1	Chalk & Talk Student seminar
		2.12	Fitting a Power Curve	T1, T2,R1	1	Chalk & Talk
		MID-I EXAMINATION				
		UNIT-III :Probability Distributions				
3	CO-3: Apply discrete and continuous probability distributions (K3).	3.1	Introduction to Probability	T1, T2, R1	1	Chalk & Talk PPT
		3.2	Conditional Probability, baye's theorem	T1, T2, R1	1	Chalk & Talk
		3.3	Discrete Random Variables	T1, T2, R1	1	Chalk & Talk,
		3.4	Continuous Random variables	T1, T2, R3	1	Chalk & Talk,
		3.5	Distribution function	T1, T2, R1	1	Chalk & Talk
		3.6	Mathematical expectation	T1, T2, R1	1	Chalk & Talk,
		3.7	variance	T1, T2, R1	1	Chalk & Talk
		3.8	Binomial distribution	T1, T2, R3	1	Chalk & Talk Student seminar
		3.9	Poisson and uniform distribution	T1, T2, R1	1	Chalk & Talk
		3.10	Poisson and uniform distribution	T1, T2, R1	1	Chalk & Talk
		3.11	Normal Distribution	T1, T2, R1	1	Chalk & Talk
		3.12	Normal Distribution	T1, T2, R1	1	Chalk & Talk
		ASSIGNMENT-II EXAMINATION				
		UNIT-IV :SAMPLING THEORY				
4	CO-4: Design the components of a classical hypothesis test (K6).	4.1	Introduction Sampling Theory	T1, T2,R1	1	Chalk & Talk, PPT
		4.2	Population Vs sample	T1, T2,R1	1	Chalk & Talk
		4.3	Sampling distribution of means, variances	T1, T2,R1	1	Chalk & Talk
		4.4	Central Limit theorem	T1, T2,R1	1	Chalk & Talk
		4.5	Introduction to t distribution	T1, T2,R1	1	Chalk & Talk
		4.6	Introduction to F Distribution	T1, T2,R1	1	Chalk & Talk
		4.7	Introduction to F Distribution	T1, T2,R1	1	Chalk & Talk
		4.8	Introduction to Chi-Square Distributions	T1, T2,R2	1	Chalk & Talk
		4.9	Introduction to Chi-Square Distributions	T1, T2,R2	1	Chalk & Talk
		4.10	Point Estimation	T1, T2,R1	1	Chalk & Talk,
		4.11	Interval Estimation	T1, T2,R1	1	Chalk & Talk Student seminar
		4.12	Maximum error of estimate	T1, T2,R1	1	Chalk & Talk
		UNIT-V : TESTING OF HYPOTHESIS				
5	CO-5: Infer the statistical internal methods based on small and large sample tests (K4).	5.1	Introduction to Tests of Hypothesis	T1, T2, R1	1	Chalk & Talk, PPT
		5.2	Formulation of Null Hypothesis, critical region, level of significance	T1, T2,R1	1	Chalk & Talk
		5.3	One Tail, Two tailed Tests Type-I, and Type-II errors	T1, T2,R1	1	Chalk & Talk Tutorial
		5.4	Large sample test -single mean	T1, T2,R1	1	Chalk & Talk
		5.5	Large sample test - two means	T1, T2,R1	1	Chalk & Talk
		5.6	Large sample test -single proportion	T1, T2,R1	1	Chalk & Talk

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		5.7	Large sample test -Double proportion	T1, T2,R1	1	Chalk & Talk
		5.8	Small samples-Students t Test	T1, T2,R1	1	Chalk & Talk
		5.9	F-Test	T1, T2,R4	1	Chalk & Talk, web resources
		5.10	F-Test	T1, T2,R4	1	Chalk & Talk, web resources
		5.11	Chi Square Test	T1, T2,R1	1	Chalk & Talk Student seminar
		5.12	Chi Square Test	T1, T2,R1	1	Chalk & Talk
		MID-II EXAMINATION				
TOTAL:60						

Text Books:

1. Miller and Freund's, "Probability and Statistics for Engineers",7/e, Pearson, 2008.
2. S. C. Gupta and V.K. Kapoor, "Fundamentals of Mathematical Statistics", 11/e, Sultan Chand & Sons Publications, 2012.

References:

1. Shron L. Myers, Keying Ye, Ronald E Walpole, Probability and Statistics Engineers and the Scientists, 8th Edition, Pearson 2007.
2. Jay l. Devore, Probability and Statistics for Engineering and the Sciences, 8 th Edition, cengage.
3. Sheldon M. Ross, "Introduction to probability and statistics Engineers and the Scientists", 4 th Edition, Academic Foundation, 2011.
4. Johannes Ledolter and Robert V. Hogg, "Applied statistics for Engineers and Physical Scientists", 3 rd Edition, Pearson, 2010.

WEB SOURCE REFERENCES:

1	https://archive.nptel.ac.in/courses/111/105/111105090/
2	https://onlinecourses.nptel.ac.in/noc21_ma74/preview
3	https://archive.nptel.ac.in/courses/111/106/111106112/
4	https://archive.org/details/NPTEL-Math-Probability_and_Statistics
5	https://onlinecourses.nptel.ac.in/noc22_ma81/preview

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Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2208	OPTIMIZATION TECHNIQUES	IV	AI&ML	4	-

COURSE OUTCOMES: Students are able to

SNO	Course Outcome Statement
CO1	**Formulate** the optimization problem, without and with constraints, by using design variables from an engineering design problem **(K6)**
CO2	**Apply** classical optimization techniques to minimize or maximize a multi-variable Objective function, without or with constraints, and arrive at an optimal solution. **(K3)**
CO3	**Apply** and Solve transportation and assignment problem by using Linear programming Simplex method. **(K3)**
CO4	**Apply** gradient and non-gradient methods to nonlinear optimization problems and use Interior or exterior penalty functions for the constraints to derive the optimal solutions. **(K3)**
CO5	**Formulate** Dynamic programming technique to inventory control, production planning, Engineering design problems etc. to reach a final optimal solution from the current optimal solution. **(K6)**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: **Formulate** the optimization problem, without and with constraints, by using design variables from an engineering design problem (K6)		**UNIT– I**			
		1.1	Statement of an Optimization problem	T1, T2, R1	2	Chalk, Talk & PPT
		1.2	design vector, design constraints, constraint surface	T1, T2, R1	2	Chalk & Talk
		1.3	objective function, objective function surfaces, classification of Optimization problems	T1, T2, R1	2	Chalk & Talk
		1.4	Single variable Optimization, multivariable Optimization without constraints	T1, R1	2	Chalk & Talk
		1.5	necessary and sufficient conditions for minimum/maximum,multivariable Optimization with equality constraints	T1, T2, R1	2	Chalk & Talk
		1.6	Solution by method of Lagrange multipliers, multivariable Optimization with inequality constraints, Kuhn – Tucker conditions	T1, T2, R1	2	Chalk & Talk
2	CO2: **Apply** classical optimization techniques to minimize or maximize a multi-variable Objective function, without or with constraints, and arrive at an optimal solution. (K3)		**UNIT-II**			
		2.1	Standard form of a linear programming problem, geometry of linear programming problems	T1, R1	2	Chalk & Talk
		2.2	geometry of linear programming problems, definitions and theorems,	T1, R1	2	Chalk & Talk
		2.3	solution of a system of linear simultaneous equations, pivotal reduction of a general system of equations,	T1, R1	4	Chalk & Talk
		2.4	Motivation to the simplex method, simplex algorithm.	T1, T2, R2	4	Chalk & Talk
			MID I EXAMINATION			

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3	CO3 Apply and Solve transportation and assignment problem by using Linear programming Simplex method. (K3)	UNIT-III				
		3.1	Finding initial basic feasible solution by north – west corner rule	T1,R2	2	Chalk, Talk
		3.2	least cost method and Vogel's approximation method	T1,R2	2	Chalk, Talk
		3.3	testing for optimality of balanced transportation problems	T1,R2	4	Chalk & Talk
		3.4	Special cases in transportation problem.	T1, R2	4	Chalk & Talk
4	CO4 Apply gradient and non-gradient methods to nonlinear optimization problems and use Interior or exterior penalty functions for the constraints to derive the optimal solutions. (K3)	UNIT-IV				
		4.1	Unconstrained cases, One – dimensional minimization methods:	T1, T2,R2	2	Chalk & Talk
		4.2	Classification, Fibonacci method, Univariate method, steepest descent method. Constrained cases	T1, T2,R2	4	Chalk & Talk
		4.3	Characteristics of a constrained problem,	T1, R2	2	Chalk & Talk
		4.4	Classification, Basic approach of Penalty Function method,	T1, R2	2	Chalk & Talk
		4.5	Basic approaches of Interior and Exterior penalty function methods	T1, R2	2	Chalk & Talk
5	CO5 Formulate Dynamic programming technique to inventory control, production planning, Engineering design problems etc. to reach a final optimal solution from the current optimal solution. (K6)	UNIT V				
		5.1	Dynamic programming multistage decision processes, types	T1, R3	2	Chalk & Talk
		5.2	concept of sub optimization and the principle of optimality	T1, R3	2	Chalk & Talk
		5.3	computational procedure in dynamic programming	T1, R3	2	Chalk & Talk
		5.4	Examples illustrating the calculus method of solution	T1, R3	4	Chalk & Talk
		5.5	Examples illustrating the tabular method of solution.	T1, R3	2	Chalk & Talk
TOTAL					60	
MID II EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS	
T	BOOK TITLE/AUTHORS/PUBLISHER
T1	Engineering optimization: Theory and practice", Singiresu. S.Rao, New Age International (P) Limited, 3rd enlarged edition, 2013
T2	"Introductory Operations Research", H.S. Kasene& K.D. Kumar, Springer (India), Pvt.LTd.
REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	"Optimization Methods in Operations Research and systems Analysis", by K.V. Mital and C. Mohan, New Age International (P) Limited, Publishers, 3rd edition, 1996.
R2	Operations Research, Dr.S.D.Sharma, Kedarnath, Ramnath& Co.

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		1.14	sub classes, super class, inheritance	T1	1	Chalk & Talk
		1.15	specialization, generalization using ER Diagrams.	T1	1	Chalk & Talk
			FIRST ASSIGNMENT			
2	**CO 2:**Analyzing relational database designing. [K4]		**Unit-2. Relational Model**			
		2.1	Introduction to relational model	T1	1	Chalk & Talk
		2.2	concepts of domain, attribute, tuple, relation	T1	2	Chalk & Talk
		2.3	importance of null values, constraints	T1	1	Chalk & Talk
		2.4	Domain, Key constraints, integrity constraints	T1	1	Chalk & Talk
		2.5	Relational Algebra	T1	2	Chalk & Talk
		2.6	Relational Calculus	T1	2	Chalk & Talk
		2.7	BASIC SQL:Simple Database schema, data types, table definitions (create, alter)	T1	2	Chalk & Talk
		2.8	Different DML operations (insert, delete, update).	T1	2	Chalk & Talk
			FIRST MID EXAMINATION			
3	**CO3:**Developing queries in DBMS [K3]		**Unit-3. : SQL**			
		3.1	Basic SQL querying (select and project) using where clause	T1	2	Chalk & Talk
		3.2	arithmetic & logical operations	T1	2	Chalk & Talk
		3.3	SQL functions(Date and Time, Numeric, String conversion	T1	3	Chalk & Talk
		3.4	Creating tables with relationship	T1	1	Chalk & Talk
		3.5	implementation of key and integrity constraints	T1	2	Chalk & Talk
		3.6	nested queries, sub queries, grouping, aggregation	T1	2	Chalk & Talk
		3.7	different types of joins	T1	2	Chalk & Talk
		3.8	view(updatable and non-updatable)	T1	1	Chalk & Talk
		3.9	Relational set operations.	T1	1	Chalk & Talk
			SECOND ASSIGNMENT			
	CO 4: Analyzing database design methodology and normalization process [K4].		**Unit-4. Schema Refinement**			
		4.1	Purpose of Normalization or schema refinement	T1	1	Chalk & Talk
		4.2	concept of functional dependency	T1	1	Chalk & Talk
		4.3	normal forms based on functional dependency	T1	2	Chalk & Talk
		4.4	Lossless join and dependency preserving decomposition	T1	1	Chalk & Talk

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4		4.5	1NF, 2NF and 3 NF	T2	1	Chalk &Talk
		4.6	concept of surrogate key, Boyce-Codd normal form(BCNF)	T1	2	Chalk &Talk
		4.7	MVD, Fourth normal form(4NF), Fifth Normal Form (5NF).	T1	2	Chalk &Talk
5	**CO5:** Analyze transaction concepts and File indexing. [K2]	**Unit 5. Transaction Concept**				
		5.1	Transaction State, ACID properties	T1	1	Chalk &Talk
		5.2	Concurrent Executions, Serializability, Recoverability	T1	2	Chalk &Talk
		5.3	Implementation of Isolation	T1	1	Chalk &Talk
		5.4	Testing for Serializability	T1	1	Chalk &Talk
		5.5	lock based, time stamp based, optimistic	T1	1	Chalk &Talk
		5.6	concurrency protocols	T1	1	Chalk &Talk
		5.7	Deadlocks	T2	1	Chalk &Talk
		5.8	Failure Classification	T2	1	Chalk &Talk
		5.9	Storage, Recovery and Atomicity	T1	1	Chalk &Talk
		5.10	Recovery algorithm	T1	1	Chalk &Talk
		5.11	Introduction to Indexing Techniques: B+ Trees	T1	1	Chalk &Talk
		5.12	operations on B+Trees	T1	1	Chalk &Talk
		5.13	Hash Based Indexing	T2	1	Chalk &Talk
TOTAL NUMBER OF HOURS: 68						
SECOND MID EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS:

1. Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
2. Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)

REFERENCE BOOKS:

1. Introduction to Database Systems, 8thedition, C J Date, Pearson.
2. Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson
3. Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

WEB-RESOURCES:

1. https://nptel.ac.in/courses/106/105/106105175/
2. https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_0127580666728202 2456_shared/overview

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DEPARTMENT OF CSE (AIML), CSE (CS), CSE (DS)
LESSON PLAN

Course Code	Course Title (Regulation)	Year-Sem	Branch	Contact Periods/Week	Sections
R23CC2204	Database Management Systems (R23)	II-II	CSE (CS)	6	A

After completion of this course, the students would be able to:

COURSE OUTCOMES:

CO224.1	Interpret the fundamentals of DBMS. [K2]	[K2]
CO224.2	Analyzing relational database designing. [K4]	[K4]
CO224.3	Developing queries in DBMS [K3]	[K3]
CO224.4	Analyzing database design methodology and normalization process [K4].	[K4]
CO224.5	Analyze transaction concepts and File indexing. [K2]	[K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	DeliveryMethod
			Unit-1. Introduction			
1	**CO 1: Interpret** the fundamentals of DBMS. [K2]	1.1	Database system	T1	1	Chalk &Talk
		1.2	Characteristics (Database Vs File System)	T1	1	Chalk &Talk
		1.3	Database Users	T1	1	Chalk &Talk
		1.4	Advantages of Database systems	T1	1	Chalk &Talk
		1.5	Database applications	T1	1	Chalk &Talk
		1.6	Brief introduction of different Data Models	T1	1	Chalk &Talk
		1.7	Concepts of Schema, Instance and data independence	T1	1	Chalk &Talk
		1.8	Three tier schema architecture for data independence	T2	1	Chalk &Talk
		1.9	Database system structure, environment	T1	1	Chalk &Talk
		1.10	Centralized and Client Server architecture for the database	T2	1	Chalk &Talk
		1.11	**Entity Relationship Model:** Introduction	T1	1	Chalk &Talk
		1.12	Representation of entities, attributes	T2	1	Chalk &Talk
		1.13	entity set, relationship, relationship set, constraints		1	Chalk &Talk

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		1.14	sub classes, super class, inheritance	T1	1	Chalk &Talk
		1.15	specialization,generalization using ER Diagrams.	T1	1	Chalk &Talk
FIRST ASSIGNMENT						
		Unit-2. Relational Model				
2	**CO 2:**Analyzing relational database designing. [K4]	2.1	Introduction to relational model	T1	1	Chalk &Talk
		2.2	concepts of domain, attribute, tuple, relation	T1	2	Chalk &Talk
		2.3	importance of null values, constraints	T1	1	Chalk &Talk
		2.4	Domain, Key constraints, integrity constraints	T1	1	Chalk &Talk
		2.5	Relational Algebra	T1	2	Chalk &Talk
		2.6	Relational Calculus	T1	2	Chalk &Talk
		2.7	BASIC SQL:Simple Database schema, data types, table definitions (create, alter)	T1	2	Chalk &Talk
		2.8	different DML operations (insert, delete, update).	T1	2	Chalk &Talk
FIRST Mid EXAMINATION						
		Unit-3. : SQL				
3	**CO3:**Developing queries in DBMS [K3]	3.1	Basic SQL querying (select and project) using where clause	T1	2	Chalk &Talk
		3.2	arithmetic & logical operations	T1	2	Chalk &Talk
		3.3	SQL functions(Date and Time, Numeric, String conversion	T1	3	Chalk &Talk
		3.4	Creating tables with relationship	T1	1	Chalk &Talk
		3.5	implementation of key and integrity constraints	T1	2	Chalk &Talk
		3.6	nested queries, sub queries, grouping, aggregation	T1	2	Chalk &Talk
		3.7	different types of joins	T1	2	Chalk &Talk
		3.8	view(updatable and non-updatable)	T1	1	Chalk &Talk
		3.9	relational set operations.	T1	1	Chalk &Talk
SECOND ASSIGNMENT						
	CO 4: Analyzing database design methodology and normalization process [K4].	**Unit-4. Schema Refinement**				
		4.1	Purpose of Normalization or schema refinement	T1	1	Chalk &Talk
		4.2	concept of functional dependency	T1	1	Chalk &Talk
		4.3	normal forms based on functional dependency	T1	2	Chalk &Talk

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DEPARTMENT OF CSE (AIML), CSE (CS), CSE (DS), AIML
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC22MC	ENVIRONMENTAL STUDIES (R23)	II- II	CSE (CS)	2	A

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO:1 Understand multi-disciplinary nature of environmental studies and Analyze the natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources.(K2)		**Unit-1. Multidisciplinary nature of Environmental Studies**			
		1.1	Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.	T1, T2, R1	1	Chalk& Talk
		1.2	Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems	T1, T2, R1	1	Chalk& Talk
		1.3	Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction	T1, T2, R1	2	Active learning & PPT
		1.4	Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems	T1	2	PPT
		1.5	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.	T1, T2, R1	1	Active learning & PPT
2	CO2: Explain the concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web. Explain the biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity. (K2)		**Unit-2. Ecosystems**			
		2.1	Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession mining, dams and effects on forest and tribal people.	T1, T2, R3	2	Active learning & PPT
		2.2	Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:	T1, T2, R3	2	PPT & Case Study
		2.3	a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem	T1, T2, R3	1	Chalk& Talk
		2.4	d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) Biodiversity and Its Conservation : Introduction and Definition: genetic, species and ecosystem diversity.	T1, T2, R3	1	Chalk& Talk

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		2.5	Bio-geographical classification of India Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values	T1	1	Chalk&
		2.6	Biodiversity at global, National and local levels – Hot-sports of biodiversity Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts	T1, T2, R1	1	Chalk& Tal
3	CO3: Distinguish various attributes of the pollution, their impacts and measures to reduce or control the pollution along with waste management(K2)	**Unit-3. Environmental Pollution:**				
		3.1	Environmental Pollution: Definition, Cause, effects and control measures of: a. Air Pollution.	T1, T2, R1	1	Chalk& Talk
		3.2	Definition, Cause, effects and control measures of: b.Water pollution c.Soil pollution	T1, T2, R1	1	Chalk& Talk
		3.3	d.Marine pollution e.Noise pollution	T1, T2, R1	1	Active learning & PPT
		3.4	Solid Waste Management: Causes, effects and control measures of urban and industrial wastes	T1, T2, R1	1	PPT
		3.5	Role of an individual in prevention of pollution – Pollution case studies	T1, T2, R1	1	Tutorial
		3.6	Disaster management: floods, earthquake, cyclone and landslides.	T1, T2, R1	1	Tutorial & PPT
4	CO4: Understand the rainwater harvesting, watershed management, and ozone layer depletion and waste land reclamation. (K2))	**Unit-4.** Social Issues and the Environment:				
		4.1	Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershedmanagement	T1, T2, R3	2	Chalk& Talk, Industrial Visit
		4.2	Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies	T1, T2, R3	2	PPT
		4.3	Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act	T1, T2, R3	2	Chalk& Talk, Case Study
		4.4	Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.	T1, T2, R3	1	Tutorial, PPT
5	CO 5: Illustrate the causes of population explosion, value education and welfare programmes. (K3).	**Unit 5.** Human Population And The Environment:				
		5.1	Population growth, variation among nations. Population explosion	T1, T2, R3	1	PPT, Chalk& Talk
		5.2	Family Welfare Programmes. – Environment and human health	T1, T2, R3 T1	1	PPT Active learning & PPT
		5.3	Human Rights – Value Education – HIV/AIDS	T1, T2, R3	1	Case Study & PPT
		5.4	Women and Child Welfare	T1, T2, R1	1	Chalk& Talk
		5.5	Role of information Technology in Environment and human health – Case studies.	T1, T2, R1	1	Chalk& Talk

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4	CO4:Relate human values with human relationship and human society, Justify the need for universal human values and harmonious existence	**Unit-4 Harmony in the Nature/Existence**				
		4.1	Understanding Harmony in the Nature	T1,R1	1	Chalk & Talk
		4.2	Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature	T1,R1	1	Chalk & Talk
		4.3	Practice Session PS10 Exploring the Four Orders of Nature	T1,R1	1	Presentation by student
		4.4	Realizing Existence as Co-existence at All Levels	T1,R1	1	Chalk & Talk
		4.5	The Holistic Perception of Harmony in Existence	T1,R1	1	Chalk & Talk
		4.6	Practice Session PS11 Exploring Co-existence in Existence	T1,R1	1	Presentation by student
5	CO5: Justify the need for universal human values and harmonious existence, Develop as socially and ecologically responsible engineers	**Unit 5. Implications of the Holistic Understanding – a Look at Professional Ethics**				
		5.1	Natural Acceptance of Human Values	T1,R1	1	Chalk & Talk
		5.2	Definitiveness of (Ethical) Human Conduct	T1,R1	1	Chalk & Talk
		5.3	Practice Session PS12 Exploring Ethical Human Conduct	T1,R1	1	Presentation by student
		5.4	A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order	T1,R1	1	Chalk & Talk
		5.5	Competence in Professional Ethics	T1,R1	1	Chalk & Talk
		5.6	Practice Session PS13 Exploring Humanistic Models in Education	T1,R1	1	Presentation by student
		5.7	Holistic Technologies, Production Systems and Management Models-Typical Case Studies	T1,R1	1	Chalk & Talk
		5.8	Strategies for Transition towards Value-based Life and Profession	T1,R1	1	Chalk & Talk
		5.9	Practice Session PS14 Exploring Steps of Transition towards Universal Human Order	T1,R1	1	Presentation by student
				Total	42	

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		5.6	Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.	T1, T2, R1	1	Chalk& Talk, Active Learning
				Total	34	

TEXT BOOKS	
T	BOOK TITLE/AUTHORS/PUBLISHER
T1	Erach Bharucha.Textbook of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
T2	Palaniswamy, Environmental Studies, 2/e. Pearson education, 2014.
T3	S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.
T4	K.Raghavan Nambiar, "Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010. .

REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e,Cengage Publications, 2012.
R2	M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BSPublication, 2014.
R3	J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering,Prentice Hall of India Private limited, 1988.
R4	G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House,2018.
R5	Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineeringand Science, 1/e, Prentice Hall of India Private limited, 1991

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DEPARTMENT OF CSE (AIML), CSE (CS), CSE (DS), AIML
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC22MC	ENVIRONMENTAL STUDIES (R23)	II- II	AIML	2	A

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO:1 Understand multi-disciplinary nature of environmental studies and Analyze the natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources.(K2)	**Unit-1. Multidisciplinary nature of Environmental Studies**				
		1.1	Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.	T1, T2, R1	1	Chalk& Talk
		1.2	Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems	T1, T2, R1	1	Chalk& Talk
		1.3	Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction	T1, T2, R1	2	Active learning & PPT
		1.4	Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems	T1	2	PPT
		1.5	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.	T1, T2, R1	1	Active learning & PPT
2	CO2: Explain the concepts of the ecosystem and its function in the environment. The need for protecting the producers and consumers in various ecosystems and their role in the food web. Explain the biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity. (K2)	**Unit-2. Ecosystems**				
		2.1	Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in the ecosystem – Ecological succession mining, dams and effects on forest and tribal people.	T1, T2, R3	2	Active learning & PPT
		2.2	Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:	T1, T2, R3	2	PPT & Case Study
		2.3	a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem	T1, T2, R3	1	Chalk& Talk
		2.4	d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) Biodiversity and Its Conservation : Introduction and Definition: genetic, species and ecosystem diversity.	T1, T2, R3	1	Chalk& Talk

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		2.5	Bio-geographical classification of India Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values	T1	1	Chalk.
		2.6	Biodiversity at global, National and local levels – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts	T1, T2, R1	1	Chalk& Ta.
3	CO3: Distinguish various attributes of the pollution, their impacts and measures to reduce or control the pollution along with waste management(K2)	**Unit-3. Environmental Pollution:**				
		3.1	Environmental Pollution: Definition, Cause, effects and control measures of: a. Air Pollution.	T1, T2, R1	1	Chalk& Talk
		3.2	Definition, Cause, effects and control measures of: b. Water pollution c. Soil pollution	T1, T2, R1	1	Chalk& Talk
		3.3	d. Marine pollution e. Noise pollution	T1, T2, R1	1	Active learning & PPT
		3.4	Solid Waste Management: Causes, effects and control measures of urban and industrial wastes	T1, T2, R1	1	PPT
		3.5	Role of an individual in prevention of pollution – Pollution case studies	T1, T2, R1	1	Tutorial
		3.6	Disaster management: floods, earthquake, cyclone and landslides.	T1, T2, R1	1	Tutorial & PPT
4	CO4: Understand the rainwater harvesting, watershed management, and ozone layer depletion and waste land reclamation. (K2))	**Unit-4.** Social Issues and the Environment:				
		4.1	Social Issues and the Environment: From Unsustainable to Sustainable development = Urban problems related to energy – Water conservation, rain water harvesting, watershedmanagement	T1, T2, R3	2	Chalk& Talk, Industrial Visit
		4.2	Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies	T1, T2, R3	2	PPT
		4.3	Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act	T1, T2, R3	2	Chalk& Talk, Case Study
		4.4	Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.	T1, T2, R3	1	Tutorial, PPT
5	CO 5: Illustrate the causes of population explosion, value education and welfare programmes. (K3).	**Unit 5.** Human Population And The Environment:				
		5.1	Population growth, variation among nations. Population explosion	T1, T2, R3	1	PPT, Chalk& Talk
		5.2	Family Welfare Programmes. – Environment and human health	T1, T2, R3 T1	1	PPT Active learning & PPT
		5.3	Human Rights – Value Education – HIV/AIDS	T1, T2, R3	1	Case Study & PPT
		5.4	Women and Child Welfare	T1, T2, R1	1	Chalk& Talk
		5.5	Role of information Technology in Environment and human health – Case studies.	T1, T2, R1	1	Chalk& Talk

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DEPARTMENT OF CSE (AIML), CSE (CS), CSE (DS)
LESSON PLAN

Course Code	Course Title (Regulation)	Year-Sem	Branch	Contact Periods/Week	Sections
R23CC2204	Database Management Systems (R23)	II-II	CSE (AIML)	6	A, B

After completion of this course, the students would be able to:

COURSE OUTCOMES:

CO224.1	Interpret the fundamentals of DBMS. [K2]	[K2]
CO224.2	Analyzing relational database designing. [K4]	[K4]
CO224.3	Developing queries in DBMS [K3]	[K3]
CO224.4	Analyzing database design methodology and normalization process [K4].	[K4]
CO224.5	Analyze transaction concepts and File indexing. [K2]	[K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			Unit-1. Introduction			
1	**CO 1: Interpret** the fundamentals of DBMS. [K2]	1.1	Database system	T1	1	Chalk &Talk
		1.2	Characteristics (Database Vs File System)	T1	1	Chalk &Talk
		1.3	Database Users	T1	1	Chalk &Talk
		1.4	Advantages of Database systems	T1	1	Chalk &Talk
		1.5	Database applications	T1	1	Chalk &Talk
		1.6	Brief introduction of different Data Models	T1	1	Chalk &Talk
		1.7	Concepts of Schema, Instance and data independence	T1	1	Chalk &Talk
		1.8	Three tier schema architecture for data independence	T2	1	Chalk &Talk
		1.9	Database system structure, environment	T1	1	Chalk &Talk
		1.10	Centralized and Client Server architecture for the database	T2	1	Chalk &Talk
		1.11	**Entity Relationship Model:** Introduction	T1	1	Chalk &Talk
		1.12	Representation of entities, attributes	T2	1	Chalk &Talk
		1.13	entity set, relationship, relationship set, constraints	T2	1	Chalk &Talk

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		1.14	sub classes, super class, inheritance	T1	1	Chalk &Talk
		1.15	specialization, generalization using ER Diagrams.	T1	1	Chalk &Talk
FIRST ASSIGNMENT						
2	**CO 2:** Analyzing relational database designing. [K4]	**Unit-2. Relational Model**				
		2.1	Introduction to relational model	T1	1	Chalk &Talk
		2.2	concepts of domain, attribute, tuple, relation	T1	2	Chalk &Talk
		2.3	importance of null values, constraints	T1	1	Chalk &Talk
		2.4	Domain, Key constraints, integrity constraints	T1	1	Chalk &Talk
		2.5	Relational Algebra	T1	2	Chalk &Talk
		2.6	Relational Calculus	T1	2	Chalk &Talk
		2.7	BASIC SQL:Simple Database schema, data types, table definitions (create, alter)	T1	2	Chalk &Talk
		2.8	Different DML operations (insert, delete, update).	T1	2	Chalk &Talk
FIRST Mid EXAMINATION						
3	**CO3:**Developing queries in DBMS [K3]	**Unit-3. : SQL**				
		3.1	Basic SQL querying (select and project) using where clause	T1	2	Chalk &Talk
		3.2	arithmetic & logical operations	T1	2	Chalk &Talk
		3.3	SQL functions(Date and Time, Numeric, String conversion	T1	3	Chalk &Talk
		3.4	Creating tables with relationship	T1	1	Chalk &Talk
		3.5	implementation of key and integrity constraints	T1	2	Chalk &Talk
		3.6	nested queries, sub queries, grouping, aggregation	T1	2	Chalk &Talk
		3.7	different types of joins	T1	2	Chalk &Talk
		3.8	view(updatable and non-updatable)	T1	1	Chalk &Talk
		3.9	Relational set operations.	T1	1	Chalk &Talk
SECOND ASSIGNMENT						
4	**CO 4:** Analyzing database design methodology and normalization process [K4].	**Unit-4. Schema Refinement**				
		4.1	Purpose of Normalization or schema refinement	T1	1	Chalk &Talk
		4.2	concept of functional dependency	T1	1	Chalk &Talk
		4.3	normal forms based on functional dependency	T1	2	Chalk &Talk
		4.4	Lossless join and dependency preserving decomposition	T1	1	Chalk &Talk

5.6	Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.	T1, T2, R1	1	Chalk& Talk, Active Learning
		Total	**34**	

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Erach Bharucha,Textbook of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
T2	Palaniswamy, Environmental Studies, 2/e, Pearson education, 2014.
T3	S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.
T4	K.Raghavan Nambiar, "Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e,Cengage Publications, 2012.
R2	M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BSPublication, 2014.
R3	J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering,Prentice Hall of India Private limited, 1988.
R4	G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House,2018.
R5	Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineeringand Science, 1/e, Prentice Hall of India Private limited, 1991

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NARASARAOPET - 522 601, Palnadu (Dist.), A.P.

Narasaraopeta Engineering College
(Autonomous)
Yallmanda (Post), Narasaraopet- 522601

DEPARTMENT OF CSE (Cyber Security)
LESSON PLAN

02/85*Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC2203	OPERATING SYSTEMS	II-II	CSE (CS)	6	A

After completion of this course, the students would be able to:

CO223.1	Classify various operating system generations, functions and services	[K2]
CO223.2	Analyze process scheduling, management and synchronization	[K4]
CO223.3	Analyze deadlock prevention, detection, avoidance and recovery techniques	[K4]
CO223.4	Analyze various memory management and storage management techniques	[K4]
CO223.5	Analyze the concepts of file system	[K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Classify various operating system generations, functions and services. [K2].		**UNIT-1 Operating System Overview:**			
		1.1	Introduction, Operating system functions	T1	2	Chalk & Talk
		1.2	Operating systems operations, Computing environments	T1	2	Chalk & Talk
		1.3	Free and Open-Source Operating Systems System Structures: Operating System Services	T1	2	Chalk & Talk
		1.4	User and Operating-System Interface, system calls, Types of System Calls	T1	2	Chalk & Talk
		1.5	system programs, Operating system Design and Implementation, Operating system structure	T1	2	Chalk & Talk
		1.6	Building and Booting an Operating System, Operating system debugging	T1	2	Chalk & Talk
FIRST ASSIGNMENT						
2	CO2: Analyze process scheduling, management and synchronization. [K4].		**UNIT-2. PROCESS**			
		2.1	Process Concept, Process scheduling, Operations on processes	T1	2	Chalk & Talk
		2.2	Inter-process communication	T1	2	Chalk & Talk
		2.3	Threads and Concurrency: Multithreading models	T1, R1	2	Chalk & Talk
		2.4	Thread libraries, Threading issues.	T1, R1	2	Chalk & Talk
		2.5	CPU Scheduling: Basic concepts, Scheduling criteria	T1, R1	2	Chalk & Talk
		2.6	Scheduling algorithms, Multiple processor scheduling	T1, R2	2	Chalk & Talk
FIRST MID EXAMINATION						
3	CO3: Analyze deadlock prevention,		**UNIT-3. Synchronization Tools**			
		3.1	The Critical Section Problem, Peterson's Solution	T1, R3	2	Chalk & Talk
		3.2	Mutex Locks, Semaphores	T1, R3		Chalk & Talk

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	detection, avoidance and recovery techniques [K4]	3.3	Monitors, Classic problems of Synchronization	T1, R3	2	Chalk & Talk
		3.4	Deadlocks: system Model, Deadlock characterization	T1, R3	2	Chalk & Talk
		3.5	Methods for handling Deadlocks, Deadlock prevention	T1,, R1	2	Chalk & Talk
		3.6	Deadlock avoidance, Deadlock detection, Recovery from Deadlock	T1, R1	2	Chalk & Talk
SECOND ASSIGNMENT						
4	CO 4: Analyze various memory management and storage management techniques [K4].	**UNIT 4. Memory-Management Strategies**				
		4.1	Introduction, Contiguous memory allocation	T1,R1	2	Chalk &Talk
		4.2	Paging, Structure of the Page Table, Swapping	T1,T2	2	Chalk & Talk
		4.3	Virtual Memory Management: Introduction, Demand paging	T1,R1	2	Chalk & Talk
		4.4	Copy-on-write, Page replacement	T1, R1	2	Chalk & Talk
		4.5	Allocation of frames, Thrashing	T1, R1	2	Chalk & Talk
5	CO 5: Analyze the concepts of file system [K2]	**UNIT 5. Storage Management**				
		5.1	Overview of Mass Storage Structure, HDD Scheduling	T2, R1	2	Chalk & Talk
		5.2	File System: File System Interface: File concept	T2, R1	2	Chalk & Talk
		5.3	Access methods, Directory Structure;	T2, R1	2	Chalk & Talk
		5.4	File system Implementation: File-system structure, File-system Operations, Directory implementation	T2, R1	2	Chalk & Talk
		5.5	Allocation method, Free space management	T2	2	Chalk & Talk
		5.6	File-System Internals: File System Mounting, Partitions and Mounting	T2	2	Chalk & Talk
		5.7	File Sharing. Protection: Goals of protection, Principles of protection, Protection Rings, Domain of protection, Access matrix	T2	2	Chalk & Talk
				Total	60	
MID II EXAMINATION						
END EXAMINATIONS						

T	TEXT BOOK
T1	Operating System Concepts, Silberschatz A, Galvin P B, Gagne G, 10th Edition, Wiley, 2018
T2	Modern Operating Systems, Tanenbaum A S, 4th Edition, Pearson , 2016

REFERENCE BOOKS

R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Operating Systems -Internals and Design Principles, Stallings W, 9th edition, Pearson, 2018
R2	Operating Systems: A Concept Based Approach, D.M Dhamdhere, 3rd Edition, McGraw- Hill, 2013

WEB REFERENCES:

1. https://nptel.ac.in/courses/106/106/106106144/
2. http://peterindia.net/OperatingSystems.html

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4		4.4	Lossless join and dependency preserving decomposition	T1	1	Chalk &Talk
		4.5	1NF, 2NF and 3 NF	T2	1	Chalk &Talk
		4.6	concept of surrogate key, Boyce-Codd normal form(BCNF)	T1	2	Chalk &Talk
		4.7	MVD, Fourth normal form(4NF), Fifth Normal Form (5NF).	T1	2	Chalk &Talk
			Unit 5. Transaction Concept			
5	**CO5:** Analyze transaction concepts and File indexing. [K2]	5.1	Transaction State, ACID properties	T1	1	Chalk &Talk
		5.2	Concurrent Executions, Serializability, Recoverability	T1	2	Chalk &Talk
		5.3	Implementation of Isolation	T1	1	Chalk &Talk
		5.4	Testing for Serializability	T1	1	Chalk &Talk
		5.5	lock based, time stamp based, optimistic	T1	1	Chalk &Talk
		5.6	concurrency protocols	T1	1	Chalk &Talk
		5.7	Deadlocks	T2	1	Chalk &Talk
		5.8	Failure Classification	T2	1	Chalk &Talk
		5.9	Storage, Recovery and Atomicity	T1	1	Chalk &Talk
		5.10	Recovery algorithm	T1	1	Chalk &Talk
		5.11	Introduction to Indexing Techniques: B+ Trees	T1	1	Chalk &Talk
		5.12	operations on B+Trees	T1	1	Chalk &Talk
		5.13	Hash Based Indexing	T2	1	Chalk &Talk
					TOTAL NUMBER OF HOURS: 68	
			SECOND MID EXAMINATION			
			END EXAMINATIONS			

TEXT BOOKS:

1. Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
2. Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)

REFERENCE BOOKS:

1. Introduction to Database Systems, 8thedition, C J Date, Pearson.
2. Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson
3. Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

WEB-RESOURCES:

1. https://nptel.ac.in/courses/106/105/106105175/
2. https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_0127580666728202456_shared/overview

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Yallmanda (Post), Narasaraopet- 522601

DEPARTMENT OF CSE (AIML), CSE (CS), CSE (DS)
LESSON PLAN

Course Code	Course Title (Regulation)	Year-Sem	Branch	Contact Periods/Week	Sections
R23CC2204	Database Management Systems (R23)	II-II	CSE (CS)	6	A

After completion of this course, the students would be able to:

COURSE OUTCOMES:

CO224.1	Interpret the fundamentals of DBMS. [K2]	[K2]
CO224.2	Analyzing relational database designing. [K4]	[K4]
CO224.3	Developing queries in DBMS [K3]	[K3]
CO224.4	Analyzing database design methodology and normalization process [K4].	[K4]
CO224.5	Analyze transaction concepts and File indexing. [K2]	[K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	DeliveryMethod
			Unit-1. Introduction			
1	**CO 1: Interpret** the fundamentals of DBMS. [K2]	1.1	Database system	T1	1	Chalk &Talk
		1.2	Characteristics (Database Vs File System)	T1	1	Chalk &Talk
		1.3	Database Users	T1	1	Chalk &Talk
		1.4	Advantages of Database systems	T1	1	Chalk &Talk
		1.5	Database applications	T1	1	Chalk &Talk
		1.6	Brief introduction of different Data Models	T1	1	Chalk &Talk
		1.7	Concepts of Schema, Instance and data independence	T1	1	Chalk &Talk
		1.8	Three tier schema architecture for data independence	T2	1	Chalk &Talk
		1.9	Database system structure, environment	T1	1	Chalk &Talk
		1.10	Centralized and Client Server architecture for the database	T2	1	Chalk &Talk
		1.11	**Entity Relationship Model:** Introduction	T1	1	Chalk & Talk
		1.12	Representation of entities, attributes	T2	1	Chalk & Talk
		1.13	entity set, relationship, relationship set, constraints	T2	1	Chalk & Talk

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		1.14	sub classes, super class, inheritance	T1	1	Chalk &Talk
		1.15	specialization,generalization using ER Diagrams.	T1	1	Chalk &Talk
	FIRST ASSIGNMENT					
			Unit-2. Relational Model			
2	**CO 2:**Analyzing relational database designing. [K4]	2.1	Introduction to relational model	T1	1	Chalk &Talk
		2.2	concepts of domain, attribute, tuple, relation	T1	2	Chalk &Talk
		2.3	importance of null values, constraints	T1	1	Chalk &Talk
		2.4	Domain, Key constraints, integrity constraints	T1	1	Chalk &Talk
		2.5	Relational Algebra	T1	2	Chalk &Talk
		2.6	Relational Calculus	T1	2	Chalk &Talk
		2.7	BASIC SQL:Simple Database schema, data types, table definitions (create, alter)	T1	2	Chalk &Talk
		2.8	different DML operations (insert, delete, update).	T1	2	Chalk &Talk
	FIRST Mid EXAMINATION					
			Unit-3. : SQL			
3	**CO3:**Developing queries in DBMS [K3]	3.1	Basic SQL querying (select and project) using where clause	T1	2	Chalk &Talk
		3.2	arithmetic & logical operations	T1	2	Chalk &Talk
		3.3	SQL functions(Date and Time, Numeric, String conversion	T1	3	Chalk &Talk
		3.4	Creating tables with relationship	T1	1	Chalk &Talk
		3.5	implementation of key and integrity constraints	T1	2	Chalk &Talk
		3.6	nested queries, sub queries, grouping, aggregation	T1	2	Chalk &Talk
		3.7	different types of joins	T1	2	Chalk &Talk
		3.8	view(updatable and non-updatable)	T1	1	Chalk &Talk
		3.9	relational set operations.	T1	1	Chalk &Talk
	SECOND ASSIGNMENT					
			Unit-4. Schema Refinement			
	CO 4: Analyzing database design methodology and normalization process [K4].	4.1	Purpose of Normalization or schema refinement	T1	1	Chalk &Talk
		4.2	concept of functional dependency	T1	1	Chalk &Talk
		4.3	normal forms based on functional dependency	T1	2	Chalk &Talk

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4		4.5	1NF, 2NF and 3 NF	T2	1	Chalk &Talk
		4.6	concept of surrogate key, Boyce-Codd normal form(BCNF)	T1	2	Chalk &Talk
		4.7	MVD, Fourth normal form(4NF), Fifth Normal Form (5NF).	T1	2	Chalk &Talk
5	**CO5:** Analyze transaction concepts and File indexing. [K2]	**Unit 5. Transaction Concept**				
		5.1	Transaction State, ACID properties	T1	1	Chalk &Talk
		5.2	Concurrent Executions, Serializability, Recoverability	T1	2	Chalk &Talk
		5.3	Implementation of Isolation	T1	1	Chalk &Talk
		5.4	Testing for Serializability	T1	1	Chalk &Talk
		5.5	lock based, time stamp based, optimistic	T1	1	Chalk &Talk
		5.6	concurrency protocols	T1	1	Chalk &Talk
		5.7	Deadlocks	T2	1	Chalk &Talk
		5.8	Failure Classification	T2	1	Chalk &Talk
		5.9	Storage, Recovery and Atomicity	T1	1	Chalk &Talk
		5.10	Recovery algorithm	T1	1	Chalk &Talk
		5.11	Introduction to Indexing Techniques: B+ Trees	T1	1	Chalk &Talk
		5.12	operations on B+Trees	T1	1	Chalk &Talk
		5.13	Hash Based Indexing	T2	1	Chalk &Talk
TOTAL NUMBER OF HOURS: 68						
SECOND MID EXAMINATION						
END EXAMINATIONS						

TEXT BOOKS:

1. Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
2. Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)

REFERENCE BOOKS:

1. Introduction to Database Systems, 8thedition, C J Date, Pearson.
2. Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson
3. Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

WEB-RESOURCES:

1. https://nptel.ac.in/courses/106/105/106105175/
2. https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_0127580666728202 2456_shared/overview

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DEPARTMENT OF CSE (AIML), CSE (CS), CSE (DS)
LESSON PLAN

Course Code	Course Title (Regulation)	Year-Sem	Branch	Contact Periods/Week	Sections
R23CC2204	Database Management Systems (R23)	II-II	CSE (DS)	6	A

After completion of this course, the students would be able to:

COURSE OUTCOMES:

CO224.1	Interpret the fundamentals of DBMS. [K2]	[K2]
CO224.2	Analyzing relational database designing. [K4]	[K4]
CO224.3	Developing queries in DBMS [K3]	[K3]
CO224.4	Analyzing database design methodology and normalization process [K4].	[K4]
CO224.5	Analyze transaction concepts and File indexing. [K2]	[K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			Unit-1. Introduction			
1	**CO 1: Interpret** the fundamentals of DBMS. [K2]	1.1	Database system	T1	1	Chalk &Talk
		1.2	Characteristics (Database Vs File System)	T1	1	Chalk &Talk
		1.3	Database Users	T1	1	Chalk &Talk
		1.4	Advantages of Database systems	T1	1	Chalk &Talk
		1.5	Database applications	T1	1	Chalk &Talk
		1.6	Brief introduction of different Data Models	T1	1	Chalk &Talk
		1.7	Concepts of Schema, Instance and data independence	T1	1	Chalk &Talk
		1.8	Three tier schema architecture for data independence	T2	1	Chalk &Talk
		1.9	Database system structure, environment	T1	1	Chalk &Talk
		1.10	Centralized and Client Server architecture for the database	T2	1	Chalk &Talk
		1.11	**Entity Relationship Model:** Introduction	T1	1	Chalk &Talk
		1.12	Representation of entities, attributes	T2	1	Chalk &Talk
		1.13	entity set, relationship, relationship set, constraints	T2	1	Chalk &Talk

		1.14	sub classes, super class, inheritance	T1	1	Chalk & Talk
		1.15	specialization, generalization using ER Diagrams.	T1	1	Chalk & Talk
	FIRST ASSIGNMENT					
2	**CO 2:**Analyzing relational database designing. [K4]	**Unit-2. Relational Model**				
		2.1	Introduction to relational model	T1	1	Chalk & Talk
		2.2	concepts of domain, attribute, tuple, relation	T1	2	Chalk & Talk
		2.3	importance of null values, constraints	T1	1	Chalk & Talk
		2.4	Domain, Key constraints, integrity constraints	T1	1	Chalk & Talk
		2.5	Relational Algebra	T1	2	Chalk & Talk
		2.6	Relational Calculus	T1	2	Chalk & Talk
		2.7	BASIC SQL:Simple Database schema, data types, table definitions (create, alter)	T1	2	Chalk & Talk
		2.8	Different DML operations (insert, delete, update).	T1	2	Chalk & Talk
	FIRST MID EXAMINATION					
3	**CO3:**Developing queries in DBMS [K3]	**Unit-3. : SQL**				
		3.1	Basic SQL querying (select and project) using where clause	T1	2	Chalk & Talk
		3.2	arithmetic & logical operations	T1	2	Chalk & Talk
		3.3	SQL functions(Date and Time, Numeric, String conversion	T1	3	Chalk & Talk
		3.4	Creating tables with relationship	T1	1	Chalk & Talk
		3.5	implementation of key and integrity constraints	T1	2	Chalk & Talk
		3.6	nested queries, sub queries, grouping, aggregation	T1	2	Chalk & Talk
		3.7	different types of joins	T1	2	Chalk & Talk
		3.8	view(updatable and non-updatable)	T1	1	Chalk & Talk
		3.9	Relational set operations.	T1	1	Chalk & Talk
	SECOND ASSIGNMENT					
	CO 4: Analyzing database design methodology and normalization process [K4].	**Unit-4. Schema Refinement**				
		4.1	Purpose of Normalization or schema refinement	T1	1	Chalk & Talk
		4.2	concept of functional dependency	T1	1	Chalk & Talk
		4.3	normal forms based on functional dependency	T1	2	Chalk & Talk
		4.4	Lossless join and dependency preserving decomposition	T1	2	Chalk & Talk

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		4.5	1NF, 2NF and 3 NF	T2	1	Chalk &Talk
		4.6	concept of surrogate key, Boyce-Codd normal form(BCNF)	T1	2	Chalk &Talk
		4.7	MVD, Fourth normal form(4NF), Fifth Normal Form (5NF).	T1	2	Chalk &Talk
		Unit 5. Transaction Concept				
5	**CO5:** Analyze transaction concepts and File indexing. [K2]	5.1	Transaction State, ACID properties	T1	1	Chalk &Talk
		5.2	Concurrent Executions, Serializability, Recoverability	T1	2	Chalk &Talk
		5.3	Implementation of Isolation	T1	1	Chalk &Talk
		5.4	Testing for Serializability	T1	1	Chalk &Talk
		5.5	lock based, time stamp based, optimistic	T1	1	Chalk &Talk
		5.6	concurrency protocols	T1	1	Chalk &Talk
		5.7	Deadlocks	T2	1	Chalk &Talk
		5.8	Failure Classification	T2	1	Chalk &Talk
		5.9	Storage, Recovery and Atomicity	T1	1	Chalk &Talk
		5.10	Recovery algorithm	T1	1	Chalk &Talk
		5.11	Introduction to Indexing Techniques: B+ Trees	T1	1	Chalk &Talk
		5.12	operations on B+Trees	T1	1	Chalk &Talk
		5.13	Hash Based Indexing	T2	1	Chalk &Talk
						TOTAL NUMBER OF HOURS: 68
			SECOND MID EXAMINATION			
			END EXAMINATIONS			

TEXT BOOKS:

1. Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
2. Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan,TMH (For Chapter 1 and Chapter 5)

REFERENCE BOOKS:

1. Introduction to Database Systems, 8thedition, C J Date, Pearson.
2. Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson
3. Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

WEB-RESOURCES:

1. https://nptel.ac.in/courses/106/105/106105175/
2. https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_0127580666728202456_shared/overview

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DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN(Academic year 2024-25)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20ME3102	Heat Power Engineering (R20)	1	Mechanical Engineering	6	

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO1: Illustrate the various types of efficiency improvements of Rankine cycle (K2)
CO2: Describe the various boilers, mountings and accessories. (K2)
CO3: Identify different types of nozzles used in steam turbines. (K3)
CO4: Classify different turbines based on utility and applications. (K4)
CO5: Discuss gas turbines, jet propulsion and rocket propulsion. (K3)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Interpret the steam power plant cycles [K2]		**Unit-1 STEAM POWER PLANT**			
		1.1	Schematic layout	T1, T2, R1	1	Chalk & Talk
		1.2	Thermodynamic analysis	T1, T2, R1	2	Chalk & Talk
		1.3	Methods to improve cycle performance	T1, T2, R1	2	Chalk & Talk, Tutorial
		1.4	Regeneration & reheating.	T1	3	Chalk & Talk, Tutorial
			COMBUSTION			
		1.5	Fuels and combustion	T2,R3	1	Chalk & Talk
		1.6	Concepts of heat reaction	T2,R3	1	Chalk & Talk, Tutorial
		1.7	Adiabatic flame temperature, flue gas analysis.	T2,R3	2	Chalk & Talk, PPT
2	CO2:Demonstrate the basics of combustion [K2]		**Unit-2. BOILERS**			
		2.1	Classification, working principles of L.P & H.P boilers	T1, T2, R3	2	Chalk & Talk
		2.2	Mountings and accessories	T1, T2, R3	2	Chalk & Talk
		2.3	Working principles, boiler horsepower, equivalent evaporation, efficiency.	T1, T2, R3	2	Chalk & Talk, Case Study
			DRAUGHT			

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		2.4	Classification, Natural and Artificial draught, induced and forced draught	T1, T2, R3	2	Chalk & Talk, PPT
		2.5	Height of chimney for given draught and discharge	T1, T2, R3	2	Chalk & Talk
		2.6	Condition for maximum discharge, efficiency of chimney.	T1, T2, R3	2	Chalk & Talk, Case Study
3	CO3: Identify different types of nozzles used in steam turbines [K3]	**Unit-3. STEAM NOZZLES**				
		3.1	Function of a nozzle, applications, types, flow through nozzles	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial
		3.2	Thermodynamic analysis, assumptions, velocity of fluid at nozzle exit	T1, T2, R1	3	Chalk & Talk, Tutorial
		3.3	Ideal and actual expansion in a nozzle, velocity coefficient, condition for maximum discharge	T1, T2, R1	3	Chalk & Talk, Case Study
MID I EXAMINATION						
3	CO3: Identify different types of nozzles used in steam turbines [K3]	3.4	Critical pressure ratio, nozzle design, Super saturated flow, its effects	T1, T2, R1	3	Chalk & Talk, Case Study
		3.5	Degree of super saturation and degree of under cooling, Wilson line.	T1	3	Chalk & Talk, PPT
4	CO4: Classify different turbines based on utility and applications[K2]	**Unit-4. STEAM TURBINES**				
		4.1	Construction & working of steam turbines	T1, T2, R3	2	Chalk & Talk, PPT
		4.2	Impulse & reaction principles	T1, T2, R3	2	Chalk & Talk, PPT
		4.3	Inlet & outlet velocity diagrams. Work output & efficiencies	T1, T2, R3	3	Chalk & Talk, Case Study
		4.4	Pressure & velocity compounding	T1, T2, R3	2	Chalk & Talk, Case Study
		4.5	Regenerative feed water heating, reheat cycles	T1, T2, R3	3	Chalk & Talk, Case Study
		4.6	Reheat factor, governing of turbine, back pressure & pass out turbine.	T1, T2, R3	2	Chalk & Talk, Tutorial
5	CO5: Report different features of gas turbines and jet engines[K2]	**Unit 5. GAS TURBINES & JET PROPULSION**				
		5.1	Simple gas turbine plant, ideal cycle	T1, T2, R1	2	Chalk & Talk, PPT
		5.2	Essential components, parameters of performance, actual cycle	T1, T2, R1	2	Chalk & Talk, Tutorial
		5.3	Regeneration, inter-cooling and reheating	T1, T2, R1	3	Chalk & Talk, Case Study

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		5.4	Closed and semi-closed cycles, merits and demerits and types of combustion chambers.	T1, T2, R1	2	Chalk & Talk, PPT
			JET PROPULSION			
		5.5	Working principle, thrust power	T1	2	Chalk & Talk
		5.6	propulsive force and efficiency	T1	2	Chalk & Talk
				Total	65	
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

T1 Thermodynamics and Heat Engines, Volume 2, R.Yadav, Centralbook depot.

T2 Heat Engineering, V.P Vasandani and D.S Kumar, MetropolitanBook Company, New Delhi

Reference Books:

R1 Gas Turbines and Propulsive Systems, P.Khajuria&S.P.Dubey, Dhanpatrai

R2 Gas Turbines, Cohen, Rogers and SaravanaMuttoo, Addison Wesley, Longman, John wiley& sons

R3 Thermal Engineering, R.S Khurmi, JS Gupta, S.Chand, Mechanical Engineering

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	representation and symbolic reasoning using different rules. [K2]	3.3	**Python for Machine Learning: :** Python data Types, Control Structure	T1, T2, R1	2	PPT
		3.4	Data manipulation using Numpy, Pandas and Matplotlib.	T1, T2, R1	2	PPT
		3.5	Pre-processing steps of Machine Learning-Data quality assessment, Data cleaning	T1, T2, R1	2	PPT
		3.6	Data transformation and Data reduction.	T1	2	PPT
4	**CO4: Apply the basic knowledge on learning and reinforcement learning. [K3]**		**Unit-4. Machine Learning**			
		4.1	Definition, Evaluation	T1, T2, R2	2	PPT
		4.2	Need, types, Applications	T1, T2, R2	2	PPT
		4.3	Supervised Learning, Classification, Regression	T1, T2, R2	2	PPT
		4.4	Un-supervised Learning, Clustering	T1, T2, R2	2	PPT
		4.5	Density Estimation, Dimensionality reduction.	T1	2	PPT
5	**CO5: Explore different machine learning algorithms [K3]**		**Unit 5. Machine Learning Algorithms**			
		5.1	Classification, Regression	T1, T2, R2	2	PPT
		5.2	KNN, K Means	T1, T2, R1	2	PPT
		5.3	Logistic, Regression	T1, T2, R2	2	PPT
		5.4	Support, Vector Machines (SVM),	T1, T2, R1	2	PPT
		5.5	Decision Tree, Naïve Bayes, Ensemble Methods	T1, T2, R1	2	PPT
		5.6	Random Forest algorithms.	T1	2	PPT
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Elaine Rich & Kevin Knight, Artificial Intelligence, Tata McGraw Hill Publishers
T2	Machine Learning Tom M. Mitchell, Tata McGraw Hill Edition Publishers
T3	Machine Learning with Python, Abhiskek Vijayvargia, BPB Publications
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Artificial Intelligence- Saroj Kaushik, CENGAGE Learning,
R2	Applications of Machine Learning, Chandra Bansal, Kusum Deep, Springer Publications

WEB SOURCE REFERENCES:

1	https://www.coursera.org/learn/machine-learning
2	https://www.simplilearn.com/big-data-and-analytics/machine-learning
3	https://www.appliedaicourse.com/course/applied-ai-course-online
4	https://www.ibm.com/cloud/learn/machine-learning
5	http://nptel.ac.in/courses/106105152

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20ME3101	ARTIFICIAL INTELLIGENCE & MACHINE LEARNING	V	Mechanical Engineering	5	A

COURSE OUTCOMES: Students are able to

SNO	Course Outcome Statements
CO1	Summarize the characteristics of AI that make it useful to real-world problems. [K2]
CO2	Analyze different search techniques and predicate logic in artificial Intelligence. [K3]
CO3	Interpret knowledge representation and symbolic reasoning using different rules. [K2]
CO4	Apply the basic knowledge on learning and reinforcement learning. [K3]
CO5	Explore different machine learning algorithms [K3]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1: Summarize the characteristics of AI that make it useful to real-world problems. [K2]**		**Unit-1: Introduction to Artificial Intelligence**			
		1.1	AI problems, foundation of AI and history	T1, T2, R1	2	PPT
		1.2	AI intelligent agents	T1, T2, R1	2	PPT
		1.3	Agents and Environments	T1, T2, R1	2	PPT
		1.4	concept of rationality, the nature of environments, structure of agents	T1, T2, R1	3	PPT
		1.5	Problem solving agents, problem formulation.	T1	3	PPT
2	**CO2: Analyze different search techniques and predicate logic in artificial Intelligence. [K3]**		**Unit-2. Search Algorithms**			
		2.1	Uninformed(Blind) type- Breadth-first search	T1, T2, R2	2	Chalk & Talk, PPT
		2.2	Uniform cost search, Depth-first search	T1, T2, R2	2	Chalk & Talk, PPT
		2.3	Informed Search; Informed type-Greedy Search	T1, T2, R2	2	PPT
		2.4	A* Search	T1, T2, R2	3	Chalk & Talk, PPT
		2.5	Graph Search.	T1	3	PPT
MID I EXAMINATION DURING SIXTH WEEK						
3	**CO3: Interpret knowledge**		**Unit-3. Knowledge Representation in AI**			
		3.1	Procedural Vs declarative knowledge	T1, T2, R1	2	PPT
		3.2	logic programming, forward Vs backward programming	T1, T2, R1	2	PPT

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	secondary forces by analytical and graphical methods	5.4	Variation of Tractive force, Swaying Couple, Hammer Blow,	T1, T2, R1,R3	2	Chalk, Talk, PPT,
		5.5	Balancing of V-engines.	T1, T2, R1,R3	2	Chalk, Talk, PPT,
				Total	66	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Theory of Machines, Thomas Bevan, Pearson education publications.
T2	Theory of machines, SS Rattan, Tata McGraw Hill publications.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Theory of Machines, W.G.Green, Blackie publications.
R2	Mechanism and Machine Theory / JS Rao and RV Dukkipati / New Age
R3	Theory of Machines / Shigley / MGH2.

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	transmission in clutches and Brakes					Seminar,
		2.3	Cone clutch, Centrifugal clutch.	T1, T2, R1,R3	2	Chalk, Talk, PPT, Model Demonstration
		2.4	Types of Brakes.	T1, T2, R1,R3	2	Chalk, Talk, PPT
		2.5	Single Block or Shoe Brake, Simple Band Brakes.	T1, T2, R1,R3	4	Chalk, Talk, PPT
		2.6	Differential Band Brake, Internal Expanding Brakes	T1, T2, R1,R3	2	Chalk, Talk, PPT, Model Demonstration
3	CO 3. **Analyse** the stability of different types of governors under dynamic analysis and study the difference between governor and flywheel	**UNIT-3: GOVERNERS AND FLYWHEELS:**				
		3.1	Types of Governors, Terms used in governors.	T1, T2, R1,R3	2	Chalk, Talk, PPT
		3.2	Watt governor, Porter governor,	T1, T2, R1,R3	2	Chalk, Talk, PPT
		3.3	Proell governor, Hartnell governor, Hartung governor, Sensitiveness of governors.	T1, T2, R1,R3	4	Chalk, Talk, PPT, Virtual Lab
		3.4	Functions, Differences between flywheel and governor.	T1, T2, R1,R3	2	Chalk, Talk, PPT, Model Demonstration
		3.5	Turning moment diagrams, flywheel analysis for I-C Engines and presses	T1, T2, R1,R3	2	Chalk, Talk, PPT, Model Demonstration
MID I EXAMINATION DURING SIXTH WEEK						
4	CO 4. **Analyse** balancing of rotating masses for forces by analytical and graphical methods	**UNIT 4: BALANCING OF ROTATING MASSES**				
		4.1	Static balancing, Dynamic balancing.	T1, T2, R1,R3	2	Chalk, Talk, PPT, Virtual Labs
		4.2	Balancing of a single rotating mass by a single mass rotating in the same plane.	T1, T2, R1,R3	2	Chalk, Talk, PPT, Virtual Labs
		4.3	Balancing of a single rotating mass by two masses rotating in different planes..	T1, T2, R1,R3	2	Chalk, Talk, PPT, Virtual Labs
		4.4	Balancing of several masses rotating in the same plane by analytical and graphical methods.	T1, T2, R1,R3	2	Chalk, Talk, Quiz, Virtual Labs
		4.5	Balancing of several rotating in different planes	T1, T2, R1,R3	4	Chalk, Talk, PPT, Virtual Labs
5	CO 5. **Analyse** balancing of reciprocating masses for primary and	**UNIT 5. BALANCING OF RECIPROCATING MASSES**				
		5.1	Unbalanced force, Primary and Secondary unbalanced forces of reciprocating masses,	T1, T2, R1,R3	4	Chalk, Talk, PPT,
		5.2	Partial Balancing of unbalanced Primary force in a reciprocating engine.	T1, T2, R1,R3	3	Chalk, Talk, PPT,
		5.3	Partial balancing of Locomotives,	T1, T2, R1,R3	3	Chalk, Talk, PPT,

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DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week
R20ME203	DYNAMICS OF MACHINERY (R20)	VI	Mechanical Engineering	5

S.NO	COURSE OUTCOME STATEMENT
CO1	**Analyse** the effect of precession motion on the stability of motor cycles, aero planes and ships, under gyroscope.
CO2	**Compute** the frictional losses and transmission in clutches and Brakes
CO3	**Analyse** the stability of different types of governors under dynamic analysis and study the difference between governor and flywheel
CO4	**Analyse** balancing of rotating masses for forces by analytical and graphical methods
CO5	**Analyse** balancing of reciprocating masses for primary and secondary forces by analytical and graphical methods

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1. **Analyse** the effect of precession motion on the stability of motor cycles, aero planes and ships, under gyroscope	**UNIT-1: GYROSCOPE AND GYROSCOPIC EFFECTS**				
		1.1	Introduction to Dynamics	T1, T2, R1,R3	2	Chalk, Talk, PPT
		1.2	Precessional Angular Motion, Gyroscopic Couple	T1, T2, R1,R3	2	Chalk, Talk, PPT
		1.3	Effect of precession motion on the stability of Aero plane taking a Turn.	T1, T2, R1,R3	3	Chalk, Talk, PPT, Web Resources
		1.4	Effect of precession motion on the stability of Naval ship taking a Turn.	T1, T2, R1,R3	3	Chalk, Talk, PPT, Web Resources
		1.5	Effect of precession motion on the stability of Four wheel vehicle moving in a curved path.	T1, T2, R1,R3	2	Chalk, Talk, Case Study,
		1.6	Effect of precession motion on the stability of Two wheel vehicle Taking a Turn.	T1, T2, R1,R3	2	Chalk, Talk, PPT, Case Study,
2	CO 2. **Compute** the frictional losses and	**UNIT-2: FRICTION CLUTCHES AND BRAKES**				
		2.1	Introduction to Friction clutches .	T1, T2, R1,R3	2	Chalk, Talk, PPT,
		2.2	Single disc or plate clutch and Multiple disc clutch.	T1, T2, R1,R3	2	Chalk, Talk, PPT, Students

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	design thinking techniques for solving problems in various sectors.	3.2	Creativity to Innovation. Teams for innovation, Measuring the impact and value of creativity.	T1, R1	1	Chalk & Talk, PPT, Web Resources
		3.3	Activity: Debate on innovation and creativity, Flow and planning from idea to innovation	T2, R4	1	Chalk & Talk, PPT
		3.4	Activity: Debate on value-based innovation.	T1, R2	1	Chalk & Talk, PPT
4	CO 4. **Analyse** to work in a multidisciplinary environment.	**Unit-4. PRODUCT DESIGN**				
		4.1	Problem formation, introduction to product design, Product strategies, Product value	T2, R1	1	Chalk & Talk, PPT, Web Resources
		4.2	Product planning, product specifications. Innovation towards product design Case studies.	T1, R3	1	Chalk & Talk, PPT, Web Resources
		4.3	Activity: Importance of modelling, how to set specifications	T1, R1	1	Chalk & Talk, PPT
		4.4	Activity: Explaining their own product design.	T2, R4	1	Chalk & Talk, PPT
5	CO 5. **Evaluate** the value of creativity.	**Unit 5. DESIGN THINKING IN BUSINESS PROCESSES**				
		5.1	Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business	T2, R2	1	Chalk & Talk, PPT, Web Resources
		5.2	Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extreme competition, Standardization	T21, R1	1	Chalk & Talk, PPT, Web Resources
		5.3	Design thinking to meet corporate needs. Design thinking for Start-ups. Defining and testing Business Models and Business Cases. Developing & testing prototypes.	T1, R1	1	Chalk & Talk, PPT
		5.4	Activity: How to market our own product, about maintenance, Reliability and plan for start-up.	T1, R1	1	Chalk & Talk, PPT
				TOTAL	**20**	
LAB INTERNAL EXAMINATIONS						
END EXAMINATIONS						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Tim Brown, Change by design, 1/e, Harper Bollins, 2009.
T2	Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media, 2014.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
R2	Shrrutin N Shetty, Design the Future, 1/e, Norton Press, 2018.
R3	William lidwell, Kritinaholden, &Jill butter, Universal principles of design, 2/e, Rockport Publishers, 2010.
R4	Chesbrough.H, The era of open innovation, 2003.

WEB SOURCE REFERENCES:

1	https://nptel.ac.in/courses/110/106/110106124/
2	https://nptel.ac.in/courses/109/104/109104109/
3	https://swayam.gov.in/nd1_noc19_mg60/preview
4	https://onlinecourses.nptel.ac.in/noc22_de16/preview

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DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R23CC22L3	DESIGN THINKING & INNOVATION	II/II	Mechanical Engineering	2	A

Course Name: DESIGN THINKING & INNOVATION		Course Code: C226
CO	**After successful completion of this course, the students will be able to:**	
C226.1	**Explain** the concepts related to design thinking	
C226.2	**Explain** the fundamentals of Design Thinking and innovation	
C226.3	**Apply** the design thinking techniques for solving problems in various sectors.	
C226.4	**Analyse** to work in a multidisciplinary environment.	
C226.5	**Evaluate** the value of creativity.	

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1. **Explain** the concepts related to design thinking		**Unit-1. INTRODUCTION TO DESIGN THINKING**			
		1.1	Introduction to elements and principles of design	T1,R1	1	Chalk & Talk, PPT, Web Resources
		1.2	basics of design-dot, line, shape, form as fundamental design components	T2, R1	1	Chalk & Talk, PPT, Web Resources
		1.3	Introduction to design thinking, history of Design Thinking, New materials in Industry.	T1, R1	1	Chalk & Talk, PPT, Web Resources
2	CO2. **Explain** the fundamentals of Design Thinking and innovation.		**Unit-2. DESIGN THINKING PROCESS**			
		2.1	Design thinking process (empathize, analyze, idea & prototype), Implementing the process in driving inventions,	T1, R1	1	Chalk & Talk, PPT, Web Resources
		2.2	Design thinking in social innovations.	T1, R1	1	Chalk & Talk, PPT, Web Resources
		2.3	Tools of design thinking - person, costumer, journey map, brainstorming, product development.	T1, R2	1	Chalk & Talk, PPT, Web Resources
		2.4	Activity: Every student presents their idea in three minutes, every student can present design process in the form of flow diagram or flow chart etc.	T2, R1	1	Chalk & Talk, PPT
		2.5	Activity: Every student should explain about product development.	T1, R1	1	Chalk & Talk, PPT
3	CO 3. **Apply** the		**Unit-3. INNOVATION**			
		3.1	Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations.	T1, R3	1	Chalk & Talk, PPT, Web Resources

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TEXT BOOKS	
T1	S.S.Rattan, Theory of Machines, 4/e, Tata Mc-Graw Hill, 2014.
T2	P.L.Ballaney, Theory of Machines & Mechanisms, 25/e, Khanna Publishers, Delhi, 2003.
REFERENCE BOOKS	
R1	F. Haidery, Dynamics of Machines, 5/e, NiraliPrakashan, Pune, 2003.
R2	J.E. Shigley, Theory of Machines and Mechanisms, 4/e, Oxford, 2014.
R3	G.K. Groover, Mechanical Vibrations, 8/e, Nemchand Bros, 2009.
R4	Norton, R.L., Design of Machinery – An Introduction to Synthesis and Analysis of Mechanisms and Machines, 2/e, McGraw Hill, New York, 2000.
R5	William T. Thomson, Theory of vibration with applications, 4/e, Englewood Cliffs, N.J.: Prentice Hall, 1993.

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3	**CO 3.: Apply** effects of gyroscopic couple in ships, aero planes and road vehicles and **Evaluate** the unbalanced mass in rotating machines using analytical and graphical methods.	**UNIT 3: GYROSCOPE & BALANCING OF ROTATING MASSES**				
		3.1	Principle of gyroscope	T1, T2&R2	2	Chalk, Talk, PPT & Web Resources
		3.2	Gyroscopic effect in an aero plane, ship, car and two wheeler	T1, T2&R2	6	Chalk & Talk
		3.3	Need for balancing, balancing of single mass	T1, T2&R2	2	Chalk, Talk, PPT
		3.4	Balancing of several masses in different planes, using analytical methods.	T1, T2&R2	2	Chalk & Talk
		3.5	Balancing of several masses in different planes, using graphical methods.	T1, T2&R2	2	Chalk & Talk
4	**CO 4: Design** different types of Cam and Gear Profiles.	**UNIT 4: CAMS & GEAR PROFILE**				
		4.1	Classification of cams and followers- Terminology and definitions	T1, T2&R1	2	Chalk, Talk, PPT & Case Study
		4.2	Displacement diagrams –Uniform velocity, parabolic, simple harmonic and cycloidal motions	T1, T2&R1	2	Chalk & Talk, PPT
		4.3	Derivatives of follower motions- specified contour cams- circular and tangent cams –pressure angle and undercutting.	T1, T2&R1	4	Chalk & Talk
		4.4	Involute and cycloidal gear profiles, gear parameters,	T1, T2&R1	2	Chalk & Talk, PPT
		4.5	fundamental law of gearing and conjugate action, spur gear contact ratio and interference / undercutting	T1, T2&R1	2	Chalk, Talk, PPT & Web Resources
		4.6	Helical, bevel, worm, rack & pinion gears, epicyclic and regular gear train kinematics	T1, T2&R1	4	Chalk, Talk, PPT & Seminar
5	**CO 5: Analyze** free and forced vibrations of single degree freedom systems.	**UNIT 5: VIBRATIONS & TURNING MOMENT DIAGRAMS**				
		5.1	Introduction, degree of freedom, types of vibrations, free natural vibrations,	T1, T2&R3	2	Chalk & Talk, PPT
		5.2	Newton method and energy method for single degree of freedom.	T1, T2&R3	2	Chalk & Talk
		5.3	Damped vibrations- under damped, critically damped; and over damped systems	T1, T2&R3	2	Chalk & Talk
		5.4	Forced vibrations without damping in single degree of freedom, Vibration isolation and transmissibility.	T1, T2&R3	2	Chalk & Talk
		5.5	Turning moment diagrams for steam engine, I.C engine and Multi Cylinder Engine.	T1, T2&R3	2	Chalk & Talk, PPT
		5.6	Crank effort – coefficient of fluctuation of energy, coefficient of fluctuation of speed.	T1, T2&R3	2	Chalk & Talk, PPT
					Total	68
		MID II EXAMINATIONS				
		END EXAMINATIONS				

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DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23ME2205	THEORY OF MACHINES	II-II	Mechanical Engineering	5	A

SNO	Course Outcome Statement: After successful completion of this course, the students will be able to:
CO1	**Analyze** different mechanisms and inversions of four bar chain and slider crank chains.
CO2	**Evaluate** displacement, velocity and acceleration of different links in a mechanism.
CO3	**Apply** effects of gyroscopic couple in ships, aero planes and road vehicles and **Evaluate** the unbalanced mass in rotating machines using analytical and graphical methods.
CO4	**Design** different types of Cam and Gear Profiles.
CO5	**Analyze** free and forced vibrations of single degree freedom systems.

Unit No	Outcome		Topics/Activity	Ref. Text book	Periods	Delivery Method
			UNIT-1: SIMPLE MECHANISMS			
1	**CO1: Analyze** different mechanisms and inversions of four bar chain and slider crank chains.	1.1	Classification of mechanisms – Basic kinematic concepts,	T1, T2&R1	2	Chalk & Talk
		1.2	Definitions – Degree of freedom, mobility – Grashof's law, Grubler's Criteria,	T1, T2&R1	2	Chalk, Talk & PPT
		1.3	Kinematic inversions of four bar chain and slider crank chains	T1, T2&R1	4	Chalk & Talk
		1.4	Limit positions – Mechanical advantage- Transmission angle	T1, T2&R1	2	Chalk, Talk & PPT
		1.5	Description of some common mechanisms- Quick return mechanism, straight line mechanisms.	T1, T2&R1	2	Chalk, Talk, PPT & Seminar
		1.6	Universal Joint.	T1, T2&R1	2	Chalk, Talk & PPT
			UNIT 2: PLANE AND MOTION ANALYSIS			
2	**CO2: Evaluate** displacement, velocity and acceleration of different links in a mechanism.	2.1	Displacement, velocity and acceleration analysis of simple mechanisms	T1, T2&R4	2	Chalk, Talk & PPT
		2.2	Velocity analysis of simple mechanisms	T1, T2&R4	2	Chalk & Talk
		2.3	Acceleration analysis of simple mechanisms	T1, T2&R4	2	Chalk & Talk
		2.4	Graphical velocity analysis using instantaneous centers, velocity and acceleration analysis	T1, T2&R4	2	Chalk, Talk, PPT & Seminar
		2.5	Kinematic analysis of simple mechanisms	T1, T2&R4	2	Chalk & Talk
		2.6	Slider crank mechanism dynamics.	T1, T2&R4	2	Chalk & Talk

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	CO 5. **Evaluate** the performance of hydraulic pumps and turbines.	5.1	Geometric similarity, Unit and specific quantities, characteristic curves, governing of turbines, selection of type of turbine,	T2, R2	3	Chalk & Talk, NPTEL
		5.2	cavitation, surge tank, water hammer. Hydraulic systems- hydraulic ram, hydraulic lift, hydraulic coupling. Advantages, limitations and applications.	T21, R1	3	Chalk & Talk, Web Resources
		5.3	classification, working, work done manometric head- losses and efficiencies	T1, R1	2	Chalk & Talk, PPT
		5.4	specific speed-performance characteristic curves, cavitation & NPSH.	T1, R1	3	Chalk & Talk, PPT
		5.5	Working, Discharge, slip, indicator diagrams.	T2, R1	2	Chalk & Talk, PPT
II-MID EXAMINATION				**TOTAL**	**74**	
END EXAMINATIONS						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	RK Bansal, Fluid Mechanics and Hydraulic Machines, 10/e, Laxmi Publications (P)Ltd, 2019.
T2	Dixon, Fluid Mechanics and Thermodynamics of Turbo machinery, 7/e, Elsevier Publishers, 2014.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	P N Modi and S M Seth, Hydraulics & Fluid Mechanics including Hydraulics Machines, Standard Book House, 2017.
R2	Y.A. Cengel, J.M.Cimbala, Fluid Mechanics, Fundamentals and Applications, McGraw Hill Publications, 2019.
R3	Rajput, Fluid Mechanics and Hydraulic Machines, S Chand & Company, 2016.
R4	D.S. Kumar, Fluid Mechanics and Fluid Power Engineering, S K Kataria &Sons, 2013.

WEB SOURCE REFERENCES:

1	https://archive.nptel.ac.in/courses/112/105/112105206/
2	https://archive.nptel.ac.in/courses/112/104/112104118/
3	https://www.edx.org/learn/fluid-mechanics
4	https://onlinecourses.nptel.ac.in/noc20_ce30/previewnptel.ac.in
5	www.coursera.org/learn/fluid-powerera

M. Venkai
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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601**

DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Year/ Sem	Branch	Contact Periods/Week	Sections
R23ME2204	**FLUID MECHANICS AND HYDRAULIC MACHINERY**	II/II	Mechanical Engineering	6	-

Course Name: FLUID MECHANICS AND HYDRAULIC MACHINERY	**Course Code: C224**
CO	**After successful completion of this course, the students will be able to:**
C224.1	**Analyze** the basic concepts of fluid properties and Calculation of metacentre height. Stability analysis and applications
C224.2	**Estimate** the mechanics of fluids in static and dynamic conditions.
C224.3	**Apply** the Boundary layer theory, flow separation and dimensional analysis.
C224.4	**Estimate** the hydro dynamic forces of jet on vanes indifferent positions.
C224.5	**Evaluate** the performance of hydraulic pumps and turbines.

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1. **Analyze** the basic concepts of fluid properties and Calculation of metacenter height. Stability analysis and applications		**Unit-1. FLUID STATICS & BUOYANCY AND FLOATATION**			
		1.1	Dimensions and units: physical properties of fluids.	T1,R1	2	Chalk & Talk
		1.2	specific gravity, viscosity and its significance, surface tension, capillarity, vapor pressure	T2, R1	3	Chalk & Talk
		1.3	Atmospheric, gauge and vacuum pressure, Measurement of pressure	T1, R1	2	Chalk & Talk, Web Resources
		1.4	Manometers - Piezometer, U-tube, inverted and differential manometers. Pascal's & hydrostatic laws.	T2, R2	3	Chalk & Talk
		1.5	Meta center, stability of floating body. Submerged bodies. Calculation of metacenter height.	T1, R4	2	Chalk & Talk, PPT
		1.6	Stability analysis and applications	T2, R3	2	Chalk & Talk, PPT
	I- ASSIGNMENT EXAMINATION					
2	CO2.		**Unit-2. FLUID KINEMATICS , FLUID DYNAMICS& CLOSED CONDUIT FLOW**			

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	Estimate the mechanics of fluids in static and dynamic conditions.	2.1	Introduction, flow types. Equation of continuity for one dimensional flow, circulation and vorticity,	T1, R1	3	Chalk & Talk, PPT
		2.2	Stream line, path line and streak lines and stream tube. Stream function and velocity potential function.	T1, R1	3	Chalk & Talk, Web Resources
		2.3	differences and relation between them. Condition for ir rotational flow, flow net, source and sink, doublet and vortex flow.	T1, R2	2	Chalk & Talk, NPTEL
		2.4	surface and body forces –Euler's and Bernoulli's equations for flow along a streamline,	T2, R1	3	Chalk & Talk, PPT
		2.5	momentum equation and its applications, force on pipe bend.	T1, R1	2	Chalk & Talk
		2.6	Reynolds's experiment- Darcy Weisbach equation-	T1, R3	2	Chalk & Talk
		2.7	Minor losses in pipes- pipes in series and pipes in parallel total energy line hydraulic gradient line.	T2, R1	3	Chalk & Talk, PPT
I-MID EXAMINATION						
3	CO 3. **Apply** the Boundary layer theory, flow separation and dimensional analysis.	**Unit-3. BOUNDARY LAYER THEORY & DIMENSIONAL ANALYSIS**				
		3.1	Introduction, momentum integral equation, displacement, momentum and energy thickness	T1, R3	3	Chalk & Talk ,Web Resources
		3.2	separation of boundary layer, control of flow separation, Stream lined body,	T1, R1	3	Chalk & Talk, PPT
		3.3	Bluff body and its applications, basic concepts of velocity profiles.	T2, R4	2	Chalk & Talk, Web Resources
		3.4	Dimensions and Units, Dimensional Homogeneity, Non dimensionalization of equations	T1, R2	3	Chalk & Talk, NPTEL
		3.5	Method of repeating variables and Buckingham Pi Theorem.	T2, R1	2	Chalk & Talk, PPT
II- ASSIGNMENT EXAMINATION						
4	CO 4. **Estimate** the hydro dynamic forces of jet on vanes indifferent positions	**Unit-4. BASICS OF TURBO MACHINERY & HYDRAULIC TURBINES**				
		4.1	hydrodynamic force of jets on stationary and moving flat, inclined, and curved vanes,	T2, R1	3	Chalk & Talk, PPT
		4.2	jet striking centrally and at tip, velocity diagrams,	T1, R3	3	Chalk & Talk ,Web Resources
		4.3	work done and efficiency, flow over radial vanes.	T1, R1	2	Chalk & Talk, PPT
		4.4	classification of turbines, impulse and reaction turbines	T2, R4	2	Chalk & Talk, PPT, NPTEL
		4.5	Pelton wheel, Francis turbine and Kaplan turbine-working proportions, work done, efficiencies	T1, R2	4	Chalk & Talk, PPT
		4.6	Hydraulic design –draft tube-theory-functions and efficiency.	T1, R1	3	Chalk & Talk, Web Resources
5		**Unit 5. PERFORMANCE OF HYDRAULIC TURBINES, CENTRIFUGAL PUMPS & RECIPROCATING PUMPS**				

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		UNIT–IV: SAMPLING THEORY				
4	**CO4:** Design the components of a classical hypothesis test (K6).	4.1	Introduction	T1, T2, R1	1	Chalk & Talk, PPT.
		4.2	Population and Samples	T1, T2, R1	1	Chalk & Talk
		4.3	Sampling distribution of Means and Variance (definition only)	T1, T2, R1	1	Chalk & Talk Students Seminars
		4.4	Sampling distribution of Means and Variance (definition only)	T1, T2, R1, R4	1	Chalk & Talk, Tutorials
		4.5	Point and Interval estimations	T1, T2, R1	1	Chalk & Talk, Tutorials
		4.6	Point and Interval estimations	T1, T2, R1, R5	1	Chalk & Talk
		4.7	Maximum error of estimate	T1, T2, R1, R2	1	Chalk & Talk
		4.8	Central limit theorem (without proof)	T1, T2, R1, R5	1	Chalk & Talk PPT
		4.9	Central limit theorem (without proof)	T1, T2, R1, R2	1	Chalk & Talk
		4.10	Estimation using t- test	T1, T2, R1, R2	1	Chalk & Talk
		4.11	Estimation using t- test	T1, T2, R1, R2	1	Chalk & Talk
		4.12	Estimation using t- test	T1, T2,R1, R3	1	Chalk & Talk PPT
			ASSIGNMENT-II EXAMINATION			
		UNIT – V: TESTS OF HYPOTHESIS				
5	**CO5:** Infer the statistical inferential methods based on small and large sampling tests (K4).	5.1	Introduction of Hypothesis	T1, T2, R1	1	Chalk & Talk PPT
		5.2	Null and Alternative Hypothesis	T1, T2, R1	1	Chalk & Talk, Tutorials
		5.3	Type I and Type II errors	T1, T2, R1	1	Chalk & Talk
		5.4	Level of significance	T1, T2, R1	1	Chalk & Talk
		5.5	One tail and two-tail tests	T1, T2, R1	1	Chalk & Talk
		5.6	Test of significance for large samples and Small Samples: Single and difference means	T1, T2,R1, R3	1	Chalk & Talk PPT
		5.7	Test of significance for large samples and Small Samples: Single and difference means	T1, T2,R1, R3	1	Chalk & Talk
		5.8	Single and two proportions	T1, T2,R1, R4	1	Chalk & Talk
		5.9	Student's t- test	T1, T2,R1, R2	1	Chalk & Talk
		5.10	F-test	T1, T2,R1, R2	1	Chalk & Talk PPT
		5.11	chi-square test	T1, T2,R1, R4	1	Chalk & Talk
		5.12	chi-square test	T1, T2,R1, R4	1	Chalk & Talk
			MID-II EXAMINATION			
						TOTAL:60

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Text Books:

1. B.S. Grewal, Higher Engineering Mathematics, 44/e, Khanna Publishers.
2. Miller and Freund's, Probability and Statistics for Engineers,7/e,Pearson,2008.

Reference Books:

1. J. W. Brown and R. V. Churchill, Complex Variables and Applications, 9/e, Mc-GrawHill,2013.
2. S.C.Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics,11/e, Sultan Chand&Sons Publications,2012.
3. Jay l. Devore, Probability and Statistics for Engineering and the Sciences, 8/e, Cengagepublishers.
4. ShronL. Myers, KeyingYe, Ronald E Walpole, Probability and Statistics Engineers and theScientists,8/e, Pearson publishers, 2007.
5. Sheldon, M.Ross, Introduction to probability and statistics Engineers and the Scientists, 4/e,Academic Foundation,2011.

WEB SOURCE REFERENCES

1	https://nptel.ac.in/courses/111107056/module2/lecture6/lecture6.pdf
2	https://nptel.ac.in/courses/122101003/downloads/Lecture-27.pdf https://nptel.ac.in/courses/115103036/module6/lec39.pdf https://nptel.ac.in/courses/111107056/module6/lecture5/lecture5.pdf https://nptel.ac.in/courses/115103036/module6/lec38.pdf
3	https://nptel.ac.in/downloads/111104032/ https://nptel.ac.in/courses/111104032/module5/lecture20.pdf
4	https://nptel.ac.in/courses/105105138/M7L35.pdf https://nptel.ac.in/courses/105108128/pdf/Mod4/Basics_M4.pdf
5	http://nptel.ac.in/courses/111105041/ http://nptel.ac.in/courses/111105035/ http://nptel.ac.in/noc/individual_course.php?id=noc16-ma03

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DEPARTMENT OF BASIC SCIENCES & HUMANITIES (MATHEMATICS)
LESSON PLAN
ACADEMIC YEAR: 2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23ME2202	COMPLEX VARIABLES, PROBABILITY AND STATISTICS	II-II	ME	6	-

CO 1. Apply Cauchy-Riemann equations to complex functions in order to determine whether a given continuous function is analytic (K3).

CO 2. Make use of the Cauchy residue theorem to evaluate certain integrals(K3).

CO 3. Apply discrete and continuous probability distributions (K3).

CO 4. Design the components of a classical hypothesis test (K6).

CO 5. Infer the statistical inferential methods based on small and large sampling tests (K4).

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT – I: FUNCTIONS OF A COMPLEX VARIABLE & COMPLEX INTEGRATION			
1	**CO1:** Apply Cauchy-Riemann equations to complex functions in order to determine whether a given continuous function is analytic (K3).	3.1	Introduction: Continuity, Differentiability, Analyticity	T1, T2, R1, R3	1	Chalk & Talk, PPT.
		3.2	Cauchy-Riemann equations in Cartesian and polar coordinates	T1, T2, R1, R2	1	Chalk & Talk
		3.3	Cauchy-Riemann equations in Cartesian and polar coordinates	T1, T2, R1, R2	1	PPT.
		3.4	Harmonic and conjugate harmonic functions	T1, T2, R1, R3	1	Chalk & Talk
		3.5	Harmonic and conjugate harmonic functions	T1, T2, R1	1	Chalk & Talk
		3.6	Milne –Thompson method	T1, T2, R1, R2	1	Chalk & Talk
		3.7	Milne –Thompson method	T1, T2, R1	1	Chalk & Talk
		3.8	Complex integration: Line integral	T1, T2, R1	1	Chalk & Talk PPT
		3.9	Cauchy's integral theorem	T1, T2, R1, R3	1	Chalk & Talk Tutorials
		3.10	Cauchy's integral formula	T1, T2, R1, R3	1	Chalk & Talk
		3.11	Cauchy's integral formula	T1, T2, R1, R3	1	Chalk & Talk PPT
		3.12	Generalized integral formula	T1, T2, R1, R2	1	Chalk & Talk

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			ASSIGNMENT-I EXAMINATION			
2	CO2:Make use of the Cauchy residue theorem to evaluate certain integrals(K3).		**UNIT–II: SERIES EXPANSIONS & RESIDUE THEOREM**			
		4.1	Radius of convergence	T1, T2, R1	1	Chalk & Talk, PPT.
		4.2	Expansion of function in Taylor's series	T1, T2, R1	1	Chalk & Talk
		4.3	Expansion of function in Taylor's series	T1, T2, R1	1	Chalk & Talk Students Seminars
		4.4	Maclaurin's series and Laurent series	T1, T2, R14	1	Chalk & Talk, Tutorials
		4.5	Maclaurin's series and Laurent series	T1, T2, R1	1	Chalk & Talk, Tutorials
		4.6	Types of Singularities: Isolated, Essential singularities, Pole of order m, Residues	T1, T2, R1, R5	1	Chalk & Talk
		4.7	Residue theorem (without proof)	T1, T2, R1, R2	1	Chalk & Talk
		4.8	Residue theorem (without proof)	T1, T2, R1, R2	1	Chalk & Talk
		4.9	Evaluation of real integral of the types $\int_{-\infty}^{\infty} f(x)dx$	T1, T2, R1, R5	1	Chalk & PPT
		4.10	Evaluation of real integral of the types $\int_{-\infty}^{\infty} f(x)dx$	T1, T2, R1, R2	1	Chalk & Talk
		4.11	Evaluation of real integral of the types $\int_{c}^{c+2\pi} f(cos\theta, sin\theta)d\theta$	T1, T2, R1, R2	1	Chalk & Talk
		4.12	Evaluation of real integral of the types $\int_{c}^{c+2\pi} f(cos\theta, sin\theta)d\theta$	T1, T2,R1, R3	1	Chalk & Talk PPT
			MID-I EXAMINATION			
3	CO3: Apply discrete and continuous probability distributions (K3).		**UNIT – III: PROBABILITY AND DISTRIBUTIONS**			
		3.1	Introduction of probability	T1, T2, R1, R3	1	Chalk & Talk, PPT.
		3.2	Baye's theorem	T1, T2, R1, R2	1	Chalk & Talk
		3.3	Random variables	T1, T2, R1, R2	1	PPT.
		3.4	Discrete and Continuous random variables	T1, T2, R1, R3	1	Chalk &
		3.5	Distribution functions: Probability mass function	T1, T2, R1	1	Chalk & Talk
		3.6	Probability density function and Cumulative distribution functions	T1, T2, R1, R2	1	Chalk & Talk
		3.7	Mathematical Expectation and Variance	T1, T2, R1	1	Chalk & Talk
		3.8	Binomial distribution	T1, T2, R1	1	Chalk & Talk PPT
		3.9	Poisson distribution	T1, T2, R1, R3	1	Chalk & Talk
		3.10	Uniform distribution	T1, T2, R1, R3	1	Chalk & Talk PPT
		3.11	Normal distribution	T1, T2, R1, R2	1	Chalk & Talk
		3.12	Normal distribution	T1, T2, R1, R2	1	Chalk & Talk Tutorials

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	management methods (K2)		management and industrial relations			
		5.2	functions of personnel management, Job- evaluation, its importance and types	T1, T2, R1,R2	2	Chalk & Talk
		5.3	Merit rating, quantitative methods, wage incentive plans, and types.	T1, T2, R1,R6	2	Chalk & Talk
		5.4	Value analysis: Value engineering, implementation procedure	T1, T2, R1,R2	2	Chalk & Talk
		5.5	Enterprise resource planning and supply chain management.	T1, T2, R1,R3	2	Chalk, Talk & PPT
					Total hours:	**54**
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

TEXTBOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	O.P Khanna, Industrial Engineering and Management, Dhanpat Rai Publications (P) Ltd, 2018.
T2	Mart and Telsang, Industrial Engineering and Production Management, S.Chand&Company Ltd. NewDelhi, 2006
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Bhattacharya DK, Industrial Management,S.Chand, publishers, 2010.
R2	J.G Monks, Operations Management,3/e, McGraw Hill Publishers1987.
R3	T.R. Banga, S.C.Sharma, N. K. Agarwal, Industrial Engineering and Management Science, Khanna Publishers, 2008.
R4	KoontzO' Donnell, Principles of Management, 4/e, McGraw Hill Publishers, 1968.
R5	R.C. Gupta, Statistical Quality Control, Khanna Publishers, 1998.
R6	NVS Raju, Industrial Engineering and Management,1/e, Cengage India Private Limited, 2013.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda (Post), Narasaraopet- 522601

DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week
R23ME2201	INDUSTRIAL MANAGEMENT	II-II	Mechanical Engineering	5

COURSE OUTCOMES: Students are able to

S. No.	Course Outcome Statement
CO1	**Explain** how to design the optimal layout (K2)
CO2	**Demonstrate** work study methods (K2)
CO3	**Explain** Quality Control techniques (K4)
CO4	**Discuss** the financial management aspects (K6)
CO5	**Interpret** human resource management methods (K2)

Unit No	Outcome	Topics/Activity		Ref Textbook	Total Periods	Delivery Method
1	CO 1: **Explain** how to design the optimal layout (K2)	**UNIT-1: INTRODUCTION**				
		1.1	Definition of industrial engineering (I.E), development, applications, role of an industrial engineer	T1, T2, R1,R3	1	Chalk & Talk
		1.2	Differences between production management and industrial engineering, quantitative tools of IE and productivity measurement. concepts of management, importance	T2, R1,R3	2	Chalk & Talk
		1.3	Plant Layout: functions of management, scientific management, Taylor's principles, theory X and theory Y, Fayol's principles of management.	T1, T2, R1,R5	3	Chalk & Talk
		1.4	Factors governing plant location, types of production layouts, advantages and disadvantages of process layout and product layout	T1, T2, R2,R4	2	Chalk & Talk
		1.5	Applications, quantitative techniques for optimal design of layouts, plant maintenance, preventive and breakdown maintenance	T1, T2, R1,R3	2	Chalk, Talk & PPT

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2	CO 2: **Demonstrate** work study methods (K2)	**UNIT-2: WORK STUDY**				
		2.1	Importance, types of production, applications	T1, T2, R1,R3	2	Chalk, Talk, PPT
		2.2	Work study, method study and time study	T1, T2, R1,R4	2	Chalk & Talk
		2.3	Work sampling, PMTS, micro-motion study	T1, T2, R1,R3	2	Chalk, Talk, PPT
		2.4	Rating techniques, MTM, work factor system, principles of Ergonomics	T1, T2, R2,R6	2	Chalk & Talk
		2.5	Flow process charts, string diagrams and Therbligs	T1, T2, R1,R3	2	Chalk, Talk & PPT
3	CO 3: **Explain** Quality Control techniques (K4)	**UNIT-3. STATISTICAL QUALITY CONTROL**				
		3.1	Quality control, Queuing assurance and its importance, SQC, attribute sampling inspection with single and double sampling	T1, T2, R5	3	Chalk & Talk
		3.2	Control charts X and R – charts X and S charts and their applications, numerical examples	T1, T2, R5	3	Chalk & Talk
MID I EXAMINATION DURING SIXTH WEEK						
		3.3	Total quality management: zero defect concept, quality circles, implementation, applications	T1, T2, R1,R5	3	Chalk & Talk
		3.4	ISO quality systems. Six Sigma–definition, basic concepts	T1, T2, R1,R5	3	Chalk, Talk & PPT
4	CO 4: **Discuss** the financial management aspects (K6)	**UNIT – 4: FINANCIAL MANAGEMENT**				
		4.1	Scope and nature of financial management, Sources of finance	T1, T2, R1,R3	2	Chalk & Talk
		4.2	Concept of Capital, Working Capital cycle, Fixed Capital V/s Working Capital, Management of working capital	T1, T2, R1,R6	3	Chalk & Talk
		4.3	Estimation of working capital requirements, Capital budgeting	T1, T2, R1,R3	2	Chalk & Talk
		4.4	Nature of Investment Decisions – Investment Evaluation criteria- NPV, IRR	T1, T2, R1,R4	2	Chalk & Talk
		4.5	PI, Payback Period, and ARR, numerical problems.	T1, T2, R1,R3	2	Chalk, Talk & PPT
5	CO 5: **Interpret** human resource	**UNIT - 5: HUMAN RESOURCE MANAGEMENT**				
		5.1	Concept of human resource management, personnel	T1, T2,	3	Chalk & Talk

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MID II EXAMINATION DURING SIXTEENTH WEEK

END EXAMINATIONS

Textbook:

1.R R Gaur, R Asthana, G P Bagaria, a Foundation Course in Human Values and Professional s, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1.

Reference:

1. JeevanVidya: EkParichaya, A Nagaraj, JeevanVidya Prakashan, Amarkantak, 1999.

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NEC

Narasaraopeta Engineering College
(Autonomous)
Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20ME4116	Electric & Hybrid Vehicles (R20)	VII	Mechanical Engineering	6	A

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO1: Tabulate different kinds HEVs (K1)
CO2: Summarize the working of different components of HEV (K2)
CO3: Demonstrate the components of Electric Drive Train (K2)
CO4: Identify the functions and requirements of storage systems (K3)
CO5: Illustrate the modelling aspects of HEVs (K2)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Tabulate different kinds HEVs (K1)	**Unit-1 INTRODUCTION TO ELECTRIC VEHICLE**				
		1.1	History of Electric Vehicles, Development towards 21st Century	T1, T2, R1	1	Chalk & Talk
		1.2	Types of Electric Vehicles in use today – Battery Electric Vehicle	T1, T2, R1	2	Chalk & Talk, Quiz
		1.3	Hybrid (ICE & others), Fuel Cell EV	T1, T2, R1	2	Chalk & Talk, Tutorial
		1.4	Solar Powered Vehicles	T1	3	Chalk & Talk, PPT
		MOTION AND DYNAMIC EQUATIONS OF THE ELECTRIC VEHICLES				
		1.5	various forces acting on the vehicle	T2,R3	1	Chalk & Talk, Quiz
		1.6	various forces acting on the vehicle in static conditions	T2,R3	1	Chalk & Talk, Tutorial
		1.7	various forces acting on the vehicle in dynamic conditions	T2,R3	2	Chalk & Talk, NPTEL
2	CO2: Summarize the working of different components of HEV (K2)	**Unit-2. INDUCTION TO HYBRID ELECTRIC VEHICLE**				
		2.1	Social and environmental importance of hybrid vehicles	T1, T2, R3	2	Chalk & Talk, NPTEL
		2.2	Social and environmental importance of electric vehicles	T1, T2, R3	2	Chalk & Talk, PPT

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TEXT BOOKS	
T	BOOK TITLE/AUTHORS/PUBLISHER
T1	Introduction to Finite Elements in Engineering, Chandraputla, Ashok and Belegundu, Prentice Hall.
T2	The Finite Element Method in Engineering by S.S.Rao, Elsevier.
REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Finite Element Procedures by Bathe, K. J. 2nd ed. Klaus-Jürgen Bathe, 2014.
R2	Textbook of Finite Element Analysis by P Seshu; PHI publisher.

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DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/ Week	Sections
R20ME4107	FINITE ELEMENT METHODS (R20)	VII	Mechanical Engineering	6	A

S.NO	COURSE OUTCOME STATEMENT
CO1	**Apply** the knowledge of Differential calculus to solve problems related to structural Engineering by approximate methods.
CO2	**Apply** finite element method to solve problems in one dimensional bar element problems
CO3	**Apply** finite element method for trusses and beams
CO4	**Apply** finite element method for 2-D CST element, numerical integration.
CO5	**Evaluate** the rate of heat transfer and temperature distribution in thin plates and fin the longitudinal and transverse vibrations by eigen values and eigen vectors.

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1. Apply the knowledge of Differential calculus to solve problems related to structural Engineering by approximate methods.		**UNIT-1: FUNDAMENTAL CONCEPTS**			
		1.1	Stress and equilibrium, Strain-displacement relations	T1, T2, R1,R3	2	Chalk, Talk, PPT
		1.2	stress-strain relations in three dimensional elasticity	T1, T2, R1,R3	2	Chalk, Talk, PPT
		1.3	Plane stress and Plane strain conditions	T1, T2, R1,R3	2	Chalk, Talk, PPT, Web Resources
		1.4	Discretization, Interpolation functions	T1, T2, R1,R3	2	Chalk, Talk, PPT, Web Resources
		1.5	Local and Global coordinates, Steps in Finite Element Method	T1, T2, R1,R3	2	Chalk, Talk, Case Study,
		1.6	Applications of Finite Element Method.	T1, T2, R1,R3	2	Chalk, Talk, PPT, Students Seminars,
2	CO 2. Apply finite element method to solve problems in one dimensional bar element problems		**UNIT-2: ONE DIMENSIONAL BAR PROBLEMS**			
		2.1	Concept of Potential Energy, shape functions	T1, T2, R1,R3	2	Chalk, Talk, PPT,
		2.2	Element stiffness matrix	T1, T2, R1,R3	2	Chalk, Talk, PPT, Students Seminar,
		2.3	Variational method, Rayleigh-Ritz method,	T1, T2, R1,R3	2	Chalk, Talk, PPT, Simulation
		2.4	Weighted Residual method	T1, T2, R1,R3	2	Chalk, Talk, PPT

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		2.5	Treatment of boundary conditions	T1, T2, R1,R3	2	Chalk, Talk, PPT
		2.6	One dimensional bar element problems.	T1, T2, R1,R3	2	Chalk, Talk, PPT, Simulation
		UNIT-3: ANALYSIS OF TRUSSES & BEAMS				
3	CO 3. **Apply** finite element method for trusses and beams	3.1	Truss element, element Stiffness matrices	T1, T2, R1,R3	2	Chalk, Talk, PPT
		3.2	Simple problems on trusses	T1, T2, R1,R3	2	Chalk, Talk, PPT
		3.3	Beam Element, Shape functions and Element stiffness matrix	T1, T2, R1,R3	4	Chalk, Talk, PPT, MOOCS
		3.4	load vector for Concentrated and Uniformly Distributed Load	T1, T2, R1,R3	2	Chalk, Talk, PPT, Flipped Learning
		3.5	Simple problems on beams.	T1, T2, R1,R3	2	Chalk, Talk, PPT, Flipped Learning
MID I EXAMINATION DURING SIXTH WEEK						
		UNIT 4: TWO DIMENSIONAL PROBLEMS				
4	CO 4. **Analyse** balancing of rotating masses for forces by analytical and graphical methods	4.1	Finite element modelling of two dimensional Problems	T1, T2, R1,R3	2	Chalk, Talk, PPT, Virtual Labs
		4.2	Constant Strain Triangle element	T1, T2, R1,R3	2	Chalk, Talk, PPT, Virtual Labs
		4.3	Treatment of boundary conditions	T1, T2, R1,R3	2	Chalk, Talk, PPT, Virtual Labs
		4.4	2-D four nodded isoparametric element	T1, T2, R1,R3	2	Chalk, Talk, Quiz, Virtual Labs
		4.5	Numerical integration Gaussian quadrature approach.	T1, T2, R1,R3	4	Chalk, Talk, PPT, Virtual Labs
		UNIT 5. STEADY STATE HEAT TRANSFER & DYNAMIC ANALYSIS				
5	CO 5. **Analyse** balancing of reciprocating masses for primary and secondary forces by analytical and graphical methods	5.1	1-D Thermal analysis of thin plane wall,	T1, T2, R1,R3	4	Chalk, Talk, PPT, Web Resources
		5.2	Analysis of a fin	T1, T2, R1,R3	2	Chalk, Talk, PPT, Web Resources
		5.3	Free vibrations, longitudinal vibrations and Transverse vibrations	T1, T2, R1,R3	2	Chalk, Talk, PPT, Virtual Labs
		5.4	Formulation of finite element model, Mass matrices	T1, T2, R1,R3	2	Chalk, Talk, PPT, Simulation
		5.5	Evaluation of Eigen values and Eigen vectors for a Stepped bar.	T1, T2, R1,R3	2	Chalk, Talk, PPT, Simulation
				Total	60	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

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Text Books:

T1 Smart Manufacturing Innovation and Transformation: Interconnection and Intelligence by Zongwei Luo, IGI Global, 2014.

T2 Industry 4.0: The Industrial Internet of Things by A Gilchrist; Apress; 1st edition 2016

Reference Books:

R1 Smart Manufacturing by Shoukat Ali; LAP LAMBERT Academic Publishing, 2016.

R2 Smart Manufacturing: Concepts and Methods by Masoud Soroush, Michael Baldea, Thomas F. Edgar, Elsevier, 2020

R2 3. CAD / CAM / CAE, E.Zimmers & M.Groover, Pearson Education

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		2.4	Hardwareand Software	T1, T2, R1,R2	2	Chalk, Talk
		2.5	Agile manufacturing systems.	T1, T2, R1,R2	3	PPT & Tutorial
		2.6	Industrial internet of things (IIoT)	T1, T2, R1,R2	2	PPT & Tutorial
3	CO 3. Analyze implemented automated manufacturing systems. [K4]		**UNIT-3. PISTON AND CYLINDER**			
		3.1	Basics of Communication Technologies for smart manufacturing systems	T1, T2, R1,R2	3	Chalk, Talk,
		3.2	Cyber Physical Systems,	T1, T2, R1,R2	3	PPT & Tutorial
MID I EXAMINATION DURING SIXTH WEEK						
3	Analyze implemented automated manufacturing systems. [K4]	3.3	Big Data analytics and Cloud computing	T1, T2, R1,R2	3	Chalk, Talk,
		3.4	Industrial Artificial Intelligence – Intelligent Analytics Services.	T1, T2, R1,R2	3	PPT & Tutorial, Quiz
4	CO 4. Compare different concepts for multi-machine systems. [K4]		**UNIT – 4: SMART MANUFACTURING ENABLED TECHNOLOGIES**			
		4.1	Smart design and Modelling, Monitoring	T1, T2, R1,R2	2	Chalk, Talk,
		4.2	Intelligent Control of Machining/Manufacturing	T1, T2, R1,R2	2	PPT & Tutorial
		4.3	Logistics/Supply Chain Processes.,	T1, T2, R1,R2	2	Chalk, Talk, & Tutorial
		4.4	Numerical Control (NC) machine tools	T1, T2, R1,R3	2	PPT Chalk, Talk
		4.5	NC Tooling and Automatic Tool Changers	T1, T2, R1,R3	2	Chalk, Talk
		4.6	CNC types, CNC Part Programming	T1, T2, R1,R3	2	Chalk, Talk
		4.7	fundamentals, manual part programming methods, Computer Aided Part Programming	T1, T2, R1,R3	2	Chalk, Talk Quiz
5	CO 5. Choose the opportunities, challenges brought about by Industry 4.0[K5]		**UNIT - 5: INDUSTRIAL ENGINEERS AND INTELLIGENT MACHINES**			
		5.1	Sizing the Gaps, Man, Machines and Product Flow,	T1, T2, R1,R3	2	Chalk, Talk, & Tutorial
		5.2	The Global Manufacturing Business and the Measure of Productivity	T1, T2, R1,R3	2	Chalk, Talk, & NPTEL
		5.3	People, Machines and the Workplace	T1, T2, R1,R3	2	Chalk, Talk, & NPTEL
		5.4	Globalization, Improving Information Capture/Traceability	T1, T2, R1,R3	2	Chalk, Talk, & NPTEL
		5.5	Improving Intelligent Decision Making under uncertainty Production	T1, T2, R1,R3	2	Chalk, Talk, & NPTEL

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DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

IV B.TECHI SEMESTER Professional Elective-III	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	0	0	30	70	100	3
Code: R20ME4102	DIGITAL MANUFACTURING						

COURSE OUTCOMES: Students are able to

CO1: Illustrate the concepts and learn the tenets of smart manufacturing. [K2]

CO2: Interpret agile manufacturing systems and smart manufacturing standards [K2]

CO3: Analyze implemented automated manufacturing systems. [K4]

CO4: Compare different concepts for multi-machine systems. [K4]

CO5: Choose the opportunities, challenges brought about by Industry 4.0[K5]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1. Illustrate the concepts and learn the tenets of smart manufacturing. [K2]		**UNIT-1 INTRODUCTION**			
		1.1	Basics of Smart manufacturing	T1, T2, R1,R2	2	PPT Chalk, Talk
		1.2	Smart Manufacturing difference from conventional/legacy manufacturing,	T1, T2, R1,R2	2	Chalk, Talk, PPT
		1.3	Role of Industry 4.0	T1, T2, R1,R2	2	Chalk, Talk, PPT
		1.4	nine pillars of smart manufacturing (Industry 4.0).	T1, T2, R1,R2	2	PPT & Tutorial
		1.5	Smart Manufacturing Processes	T1, T2, R1,R2	2	Chalk, Talk, PPT & Tutorial
		1.6	manufacturing concerns with compliances	T1, T2, R1,R2	2	Chalk, Talk, PPT & Tutorial
		1.7	skill gap, energy monitoring, and standards,.	T1, T2, R1,R2	2	PPT Chalk, Talk
2	CO:2 Interpret agile manufacturing systems and smart manufacturing standards [K2]		**UNIT-2: SMART FACTORIES AND PROCESS IMPLEMENTATION**			
		2.1	Introduction of smart factories, challenges	T1, T2, R1,R2	2	Chalk, Talk, PPT
		2.2	smart-predictable manufacturing	T1, T2, R1,R2	3	PPT & Tutorial
		2.3	Benefits of Smart Factory Implementation	T1, T2, R1,R2	2	PPT, Chalk, Talk

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		Unit-4. Spread of Indian Culture Abroad				
4	CO4: Know the spread of cultural exchange in abroad [K4].	4.1	Causes, Significance and Modes of Cultural Exchange	T2, R2	3	Web Resources
		4.2	Through Traders, Teachers, Emissaries, Missionaries and Gypsies	T2, R2	1	Chalk & Talk
		4.3	India, Central Asia through ages	T2, R2	1	Chalk & Talk
		4.4	India, Western World through ages	T2, R2	1	PPT
		Unit 5. Education System in India				
5	CO5: Know the contributions of scientists in different eras [K4].	5.1	Education in ancient, medieval and modern India	T2, R2	1	Web Resources
		5.2	aims of education, Science of ancient India	T2, R2	1	PPT
		5.3	aims of education, Science of Modern India	T2, R2	1	Chalk & Talk
		5.4	Scientists of ancient India,	T2, R2	1	Chalk & Talk
		5.5	Scientists of Modern India	T2, R2	1	Chalk & Talk
				Total	28	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Kapil Kapoor, "Text and Interpretation: The indian tradition" ISBN: 81246033375, 2005
T2	" Science in Samskrit", Samskrita Bharti Publisher , ISBN 13 : 978- 8187276333,2007
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	NCERT , "Position Paper On Arts ,Music, Dance Theatre", ISBN 81-7450 494-X,200
R2	The indian tradition by PM Bakshi, Universal law publishing co

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DEPARTMENT OF MECHANICAL
LESSON PLAN (A.Y-2024-2025)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC32MC01	EITK (R20)	III/II	MECHANICAL	2	A

COURSE OUTCOMES:

After successful completion of the course students will be able to

- Understand the philosophy of Indian Culture [K2].
- Know the Indian languages, Epics Ramayana and Mahabharata [K2].
- Acquire the information about Indian arts and architecture [K4].
- Know the spread of cultural exchange in abroad [K4].
- Know the contributions of scientists in different eras [K4].

U No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
		Unit-1. Indian Culture: An Introduction				
1	CO1: Understand the philosophy of Indian Culture [K2].	1.1	Characteristics, Significance and Geography of Indian culture	T1, R1	3	Web Resources
		1.2	Society in India through ages- Ancient period	T1, R1	1	Chalk & Talk
		1.3	Varna and jati, family and marriage in India	T1, R1	1	Chalk & Talk
		1.4	Position of women in ancient India	T1,R1	1	PPT
		1.5	Contemporary period; caste system and communalism	T1,R1	1	Chalk & Talk
		Unit-2. Indian Languages and Literature				
2	CO2: Know the Indian languages, Epics Ramayana and Mahabharata [K2].	2.1	Evolution of script and languages in India: Harappan Script and Brahmi Script	T1, R1	1	Web Resources
		2.2	Short History of the Sanskrit literature: The Vedas, The Brahmanas	T1, R1	1	Chalk & Talk
		2.3	Short History of the Sanskrit literature: Upanishads & Sutras	T1, R1	1	Chalk & Talk
		2.4	Epics: Ramayana	T1, R1	1	PPT
		2.5	Epics: Mahabharata	T1, R1	1	Chalk & Talk
		Unit-3. Indian Arts and Architecture				
	CO3: Acquire the information about Indian arts and architecture [K4].	3.1	Indian Art & Architecture: Hindu Temple Architecture	T1, R1	1	Web Resources
		3.2	Indian Art & Architecture: Buddhist Architecture	T1, R1	1	Chalk & Talk
		3.3	Indian Art & Architecture: Medieval Architecture	T1, R1	1	Chalk & Talk
		MID I EXAMINATION				
		3.4	Rise of modern theatre	T1, R1	1	Chalk & Talk
		3.5	Rise of Indian cinema	T1, R1	1	PPT

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		5.4	Measurement of Digital Media: Analyzing Digital Media Performance	T1, T2, R1,R3	2	PPT
		5.5	Analyzing Website Performance, Analyzing Advertising Performance.	T1, T2, R1,R3	2	PPT
					Total hours:	**54**
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Dave Evans., Susan Bratton, [2008]. Social Media Marketing: An Hour a Day. ,2nd edition, Wiley
T2	Dave Evans., Susan Bratton, [2010]. Social Media Marketing: The Next Generation of Business Engagement. Wiley
T3	Your Google Game Plan for Success: Increasing Your Web Presence with Google AdWords, Analytics and Website Optimizer, Joe Teixeira, Wiley 2010
T4	Michael Miller, B2B Digital Marketing, 1e, Pearson, 2014.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	1. Vandana Ahuja, Digital marketing, Oxford University Press 2015.
R2	2. Michael R Solomon, Tracy Tuten, Social Media Marketing, Pearson, 1e, 2015.
R3	3. Judy Strauss & Raymond Frost, E-Marketing, Pearson, 2016.
R4	4. Richard Gay, Alan Charles worth and Rita Esen, Online marketing – A customer led approach Oxford University Press 2007.

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DEPARTMENT OF MBA
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week
R20CC20E13	Digital Marketing (R20)	III-II	Mechanical Engineering	4

COURSE OUTCOMES: Students are able to
CO1: Outline the basic concepts of Digital Marketing [K2]
CO2: Analyze different channels of digital marketing according to the changing requirements of the markets [K4]
CO3: Construct different digital marking plans on situational basis [K3]
CO4: Improve marketing through search engine and online advertising (K6)
CO5: Compare different avenues of social media for marketing and advertising products for effective sales [K4]

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
1	CO 1: Outline the basic concepts of Digital Marketing. [K2]	**UNIT-1: INTRODUCTION TO DIGITAL MARKETING**				
		1.1	Introduction & Concept of Digital Marketing	T1, T2, R1,R3	1	Chalk, Talk
		1.2	Components of Digital Marketing	T1, T2, R1,R3	2	Chalk, Talk, PPT
		1.3	Need and Scope of Digital Marketing, Benefits of Digital Marketing	T1, T2, R1,R3	3	PPT & Tutorial
		1.4	Digital Marketing Platforms and Strategies, Comparison of Marketing and Digital Marketing	T1, T2, R1,R3	2	Chalk, Talk, PP
		1.5	Digital Marketing Trends. How different segments use Digital Media	T1, T2, R1,R3	2	Chalk, Talk, PPT
2	CO 2: Analyze different channels of digital marketing according to the changing requirements of the markets. [K4]	**UNIT-2: CHANNELS OF DIGITAL MARKETING**				
		2.1	Digital Marketing, Website Marketing	T1, T2, R1,R3	2	Chalk, Talk, PPT
		2.2	Search Engine Marketing, Online Advertising	T1, T2, R1,R3	2	PPT & Tutorial

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		2.3	Email Marketing, Blog Marketing	T1, T2, R1,R3	2	PPT
		2.4	Social Media Marketing, Audio, Video and Interactive Marketing	T1, T2, R1,R3	2	Chalk, Talk
		2.5	Mobile Marketing	T1, T2, R1,R3	2	PPT & Tutorial
3	CO 3: Construct different digital marking plans on situational basis.[K3]	**UNIT-3. DIGITAL MARKETING PLAN**				
		3.1	Need of a Digital Marketing Plan, Elements of a Digital Marketing Plan	T1, T2, R1,R3	3	Chalk, Talk,
		3.2	Marketing Plan, Executive Summary, Mission, Situational Analysis, Opportunities and Issues	T1, T2, R1,R3	3	PPT & Tutorial
MID I EXAMINATION DURING SIXTH WEEK						
3		3.3	Goals and Objectives, Marketing Strategy	T1, T2, R1,R3	3	Chalk, Talk,
		3.4	Action Plan, Budget, Writing the Marketing Plan and Implementing the Plan.	T1, T2, R1,R3	3	PPT & Tutorial
4	CO 4: Improve marketing Through search engine and online advertising (K6)	**UNIT – 4: SEARCH ENGINE MARKETING AND ONLINE ADVERTISING**				
		4.1	Importance of SEM, understanding Web Search – keywords	T1, T2, R1,R3	2	Chalk, Talk,
		4.2	HTML tags, Inbound Links, Online Advertising vs. Traditional Advertising	T1, T2, R1,R3	3	PPT & Tutorial
		4.3	Payment Methods of Online Advertising – CPT [Cost-per-Thousand] and CPC [Cost-per-click]	T1, T2, R1,R3	2	Chalk, Talk, & Tutorial
		4.4	Display Ads - choosing a Display Ad Format	T1, T2, R1,R3	2	PPT
		4.5	Landing Page and its importance.	T1, T2, R1,R3	2	Chalk, Talk
5	CO 5: Compare different avenues of social media for marketing and advertising products for effective sales. [K4]	**UNIT - 5: SOCIAL MEDIA MARKETING**				
		5.1	Understanding Social Media, Social Networking with Facebook, LinkedIn	T1, T2, R1,R3	3	Chalk, Talk,
		5.2	Blogging as a social medium, Micro blogging with Twitter, Social Sharing with YouTube	T1, T2, R1,R3	2	PPT & Tutorial
		5.3	Social Media for Customer Reach, Acquisition and Retention.	T1, T2, R1,R3	2	Chalk, Talk,

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3	**CO3: Analyze** kinematics of a robot **[K4]**	**UNIT-III: ROBOT KINEMATICS**				
		3.1	The fundamentals of kinematics,	T1, T2, R2,R4	2	Chalk, Talk & PPT
		3.2	Differential kinematics	T1, T2,	1	Chalk, Talk & PPT
		3.3	Statics- Kinematic chains	R2,R4	1	Chalk, Talk & PPT
		3.4	Forward kinematics analytical methods	T1, T2, R2,R4	4	Chalk, Talk
		3.5	Inverse kinematics- analytical methods.	T1, T2, R2,R4	4	Chalk, Talk
4	**CO4: Analyze** Dynamics of a robot **[K4]**	**UNIT-IV: ROBOT DYNAMICS**				
		4.1	Differential kinematics- Jacobian computation,	T1, T2, R2,R3	2	Chalk & Talk
		4.2	Singular configurations, Configuration space operation		2	Chalk & Talk
		4.3	Dynamics- Lagrange	T1, T2, R2,R3	2	Chalk & Talk
		4.4	Euler and Newton,		2	Chalk & Talk
		4.5	Euler formations, Problems.	T1, T2, R2,R3	3	Chalk &Talk
5	**CO5: Illustrate** present and future applications of robots **[K2]**	**UNIT V: ROBOT APPLICATIONS IN MANUFACTURING**				
		5.1	Material Transfer, Material handling,	T1, T2, R3	2	Chalk, Talk & PPT
		5.2	Loading and unloading, Processing,spot and continuous arc welding & spray painting,	T1, T2, R3	2	Chalk, Talk & PPT
		5.3	Assembly and Inspection.	T1, T2, R3	2	Chalk, Talk & PPT
		5.4	Path planning in robotics.	T1, T2, R3	2	Chalk, Talk & PPT
		5.5	Future applications of robots.	T1, T2, R3	1	Chalk, Talk & PPT
				Total	56	

Text Books:

T1 Industrial Robotics, Groover M P,Pearson Edu.

T2 Robotics and Control, Mittal R K &Nagrath I J,Tata McGraw Hill.

Reference Books:

R1 Robotics: Fundamental Concepts and Analysis, Ashitava Ghosal, Oxford Publications.

R2 Robotic Systems: Applications, Control and Programming; Edited by Ashish Dutta, IntechOpen.

R3 Robotics, Fu K S, McGraw Hill.

R4 Robotic Engineering, Richard D. Klafter, Prentice Hall.

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NARASARAOPETA ENGINEERING COLLEGE
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NARASARAOPET-522 601, Palnadu (Dist.), A.P

NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20ME3207	ROBOTICS AND APPLICATIONS	VI	Mechanical Engineering	4	A & B

COURSE OUTCOMES: Students are able to

SNO	Course Outcome Statement
CO1	**Distinguish** between automation and robotics and **identify** various components of robot. **[K3]**
CO2	**Select** appropriate type of actuators and sensors for different applications. **[K3]**
CO3	**Analyze** kinematics of a robot. **[K4]**
CO4	**Analyze** Dynamics of a robot. **[K4]**
CO5	**Illustrate** present and future applications of robots .**[K2]**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1: Distinguish** between automation and robotics and identify various components of robot [K3]		**UNIT– I : INTRODUCTION**			
		1.1	**Fundamentals Of Robotics:** Introduction to Robotics, components of robot, Robot history,	T1, T2, R1,R3	2	Chalk, Talk & PPT
		1.2	Robotic controls and systems, classification, challenges and opportunities,	T1, T2, R1,R4	2	Chalk, Talk & PPT
		1.3	**Homogenous Coordinates And Transform Representations:** Vector spaces, inner products, vector norms,	T1, T2, R1,R3	2	Chalk, Talk
		1.4	Orthogonally, linear transformations, matrix multiplication	T1, T2, R1,R3	4	Chalk, Talk
		1.5	Matrix groups, Coordinate transformations, rigid transformations, rotation matrices	T1, T2, R1,R3	4	Chalk, Talk
2	**CO2: Select** appropriate type of actuators and sensors for different applications **[K3]**		**UNIT-II: ROBOT ACTUATORS AND SENSORS**			
		2.1	**Actuators:** Types, working principles,	T1, T2, R1	2	Chalk, Talk & PPT
		2.2	Applications and advancements (Hydraulic devices)	T1, T2, R1	2	Chalk, Talk & PPT
		2.3	Applications and advancements (Electric motors such as DC servomotors and stepper motors, Pneumatic devices).	T1, T2, R1	2	Chalk, Talk & PPT
		2.4	**Sensors:** Basic Elements, General Classification of Sensors,	T1, T2, R1	2	Chalk, Talk & PPT
		2.5	Types and working, use of sensors in robotics.	T1, T2, R1	2	Chalk, Talk & PPT

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		4.7	LMTD and NTU methods, Problems on LMTD and NTU methods.	T1, T2, R2	2	Case Study& Tutorial
5	CO 5. **Estimation** of radiation heat transfer between bodies. [K5]	**Unit 5. HEAT TRANSFER WITH PHASE CHANGE**				
		5.1	BOILING: Pool boiling–regimes-calculations on nucleate boiling, critical heat flux and film boiling.	T1, T2, R1	2	Chalk & Talk, PPT
		5.2	Calculations on Nucleate boiling, Critical Heat flux and Film boiling.	T1, T2, R1	2	Case Study& Tutorial
		5.3	**CONDENSATION:** Film wise and drop wise condensation	T1, T2, R1	2	Chalk & Talk, PPT
		5.4	**RADIATION HEAT TRANSFER:** Emission characteristics and laws of black-body radiation	T1, T2, R2	2	Chalk & Talk, PPT
		5.5	Irradiation – total and monochromatic quantities	T1, T2, R2	2	Chalk & Talk, PPT
		5.6	laws of Planck, Wien, Kirchhoff, Lambert, Stefan and Boltzmann	T1, T2, R2	2	Chalk & Talk, PPT
		5.7	heat exchange between two black bodies -concepts of shape factor – Emissivity – heat exchange between grey bodies	T1, T2, R2	2	Case Study& Tutorial
		5.8	Problems	T1, T2, R2	2	Case Study& Tutorial
MID II EXAMINATION DURING EIGHTEENTH WEEK					TOTAL – 70 Hours	
END EXAMINATIONS						

Text Books:

T1 Fundamentals of Engineering Heat and Mass Transfer, R.C.Sachdeva, New Age International.

T2 Heat Transfer, P.K.Nag, Tata McGraw Hill

Reference Books:

R1 Heat Transfer, J.P.Holman, Tata McGraw Hill

R2 Principles of Heat Transfer, Frank Kreith, RM Manglik& MS Bohn, Cengage learning publishers.

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		2.4	significance of Biot and Fourier Numbers, Infinite bodies, Lumped heat capacity systems	T1, T2, R2	3	Case Study& Tutorial
		2.5	Chart solutions of transient conduction systems, Concept of Semi-infinite body. Problems	T1, T2, R2	2	Case Study& Tutorial
			Unit-3. CONVECTIVE HEAT TRANSFER			
3	CO 3. **Estimate** heat loss from the system to the surroundings using convection. [K5]	3.1	**INTRODUCTION TO CONVECTION:** Non Dimensional Analysis, Buckingham – π Theorem	T1, T2, R1	2	Chalk & Talk, PPT
		3.2	**FORCED CONVECTION:** External Flows: Introduction, Principles of convection.	T1, T2, R1	2	Chalk & Talk, PPT
		3.3	Hydrodynamic and thermal boundary layers and their thicknesses.	T1, T2, R1	2	Chalk & Talk, PPT
		3.4	Correlations for heat transfer in Laminar and Turbulent flows over a flat plate relation between fluid friction and heat transfer in laminar flows.	T1, T2, R1	2	Case Study& Tutorial
		3.5	Problems	T1, T2, R1	2	Case Study& Tutorial
			MID I EXAMINATIONS DURING SIXTH WEEK			
	CO 3. **Estimate** heat loss from the system to the surroundings using convection. [K5]	3.6	**INTERNAL FLOWS:** Division of Internal Flow through Concepts of Hydrodynamic and Thermal Entry Lengths	T1, T2, R1	2	Chalk & Talk, PPT
		3.7	Use of Empirical Relations for Convective Heat Transfer in Horizontal Pipe Flow.	T1, T2, R1	2	Case Study& Tutorial
		3.8	Problems	T1, T2, R1	2	Case Study& Tutorial
			Unit 4. INTERNAL FLOWS			
4	CO4. **Determine** various methods of design of heat exchangers. [K5]	4.1	**NATURAL CONVECTION:** Mechanism of natural convection, Development of Hydrodynamic and thermal boundary layer along a vertical plate	T1, T2, R2	2	Chalk & Talk, PPT
		4.2	Use of empirical relations for Vertical plates and pipes	T1, T2, R1	2	Case Study& Tutorial
		4.3	**HEAT EXCHANGERS:** Classification, types of heat exchangers, Recuperators and Applications	T1, T2, R1	2	Chalk & Talk, PPT
		4.4	Flow arrangement, Temperature distribution, Overall heat transfer coefficient, Fouling factor	T1, T2, R2	2	Chalk & Talk, PPT
		4.5	LMTD and NTU methods of Heat exchanger analysis	T1, T2, R2	2	Case Study& Tutorial
		4.6	Correction for LMTD for use with multi pass and cross flow Heat Exchangers, Effectiveness	T1, T2, R2	2	Case Study& Tutorial

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20ME3202	HEAT TRANSFER	VI	Mechanical Engineering	5	A

COURSE OUTCOMES:

The student will be able to

CO1: Illustrate various modes of heat transfer [K2]
CO2: Analyze various methods of heat transfer using extended surfaces and fins [K4]
CO3: Estimate heat loss from the system to the surroundings using convection. [K5]
CO4: Determine various methods of design of heat exchangers. [K5]
CO5: Estimation of radiation heat transfer between bodies. [K5]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1. **Illustrate** various modes of heat transfer [K2]		**Unit-1. INTRODUCTION**			
		1.1	Modes and mechanisms of heat transfer, Basic laws of heat transfer	T1, T2, R1	1	Chalk & Talk, PPT
		1.2	Applications of heat transfer. Conduction Heat Transfer, Fourier equation, Steady state Heat Conduction	T1, T2, R1	2	Chalk & Talk, Case Study
		1.3	general heat conduction equation in Cartesian, Cylindrical and Spherical coordinates	T1, T2, R1	2	Chalk & Talk, PPT
		1.4	Steady, unsteady, and periodic heat transfer, initial and boundary conditions.	T1, T2, R1	2	Chalk & Talk, Case Study
		1.5	Heat flow through plane wall and cylinder with constant thermal conductivity	T1, T2, R1	2	Case Study& Tutorial
		1.6	Heat flow through composite slab and Cylinders	T1, T2, R1	2	Chalk & Talk, PPT
		1.7	Electrical analogy, Critical radius of insulation, Problems	T1, T2, R1	1	Case Study& Tutorial
2	CO 2. **Analyze** various methods of heat transfer using extended surfaces and fins [K4]		**Unit-2. FINS & EXTENDED SURFACES, ONE DIMENSIONAL STEADY STATE CONDUCTION HEAT TRANSFER**			
		2.1	**FINS & EXTENDED SURFACES:** Types, Applications	T1, T2, R1	1	Chalk & Talk, PPT
		2.2	Fin materials, Heat transfer from fins with uniform cross section, Fin efficiency and Effectiveness.	T1, T2, R2	3	Chalk & Talk, Case Study
		2.3	**ONE-DIMENSIONAL UNSTEADY STATE HEAT CONDUCTION:** Analytical Solutions for Plane wall, cylinder and sphere	T1, T2, R1	3	Chalk & Talk, Case Study

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			connecting rod ends	R1,R3		Tutorial
		2.3	Cranks and Crank shafts,	T1, T2, R1,R3	2	PPT
		2.4	Strength and proportions of over hung crank shaft	T1, T2, R1,R3	2	Chalk, Talk
		2.5	Centre cranks, Crank pins, Crank shafts.	T1, T2, R1,R3	3	PPT & Tutorial
3	CO 3. Analyze stresses on the piston and cylinder depending upon Design and proportions. [K4]		**UNIT-3. PISTON AND CYLINDER**			
		3.1	Pistons	T1, T2, R1,R3	3	Chalk, Talk,
		3.2	Forces acting on piston, Construction	T1, T2, R1,R3	3	PPT & Tutorial
MID I EXAMINATION DURING SIXTH WEEK						
3	Analyze stresses on the piston and cylinder depending upon Design and proportions. [K4]	3.3	Design and proportions of piston	T1, T2, R1,R3	3	Chalk, Talk,
		3.4	Cylinder. Cylinder liners.	T1, T2, R1,R3	3	PPT & Tutorial
4	CO 4. Identify the loads and machine members subjected and calculate static and dynamic stresses to ensure safe design. [K3]		**UNIT – 4: DESIGN OF CURVED BEAMS**			
		4.1	Introduction,	T1, T2, R1,R3	2	Chalk, Talk,
		4.2	Stresses in curved beams.	T1, T2, R1,R3	3	PPT & Tutorial
		4.3	Expression for radius of neutral axis for rectangular, circular, trapezoidal and T-Section,	T1, T2, R1,R3	3	Chalk, Talk, & Tutorial
		4.4	C – Clamps.	T1, T2, R1,R3	2	PPT
		4.5	Design of crane hook.	T1, T2, R1,R3	3	Chalk, Talk
5	CO 5. Compare capacities of power transmission of Belt, Rope and Chain Drives. [K2]		**UNIT - 5: POWER TRANSMISSION SYSTEMS**			
		5.1	Transmission of power by Belt and Rope drives	T1, T2, R1,R3	2	Chalk, Talk,
		5.2	Transmission Efficiencies	T1, T2, R1,R3	3	PPT & Tutorial
		5.3	Belts – Flat and V types	T1, T2, R1,R3	3	Chalk, Talk,
		5.4	Ropes - pulleys for belt and rope drives, Materials,	T1, T2, R1,R3	3	PPT
		5.5	Chain drives.		2	PPT
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

70

Text Books:

T1 Machine Design, V.B. Bandari, Tata McGraw Hill Publishers.
T2 Machine Design, Pandya & Shaw, Charotar publishers.

Reference Books:

R1 Machine Design, R.N. Norton, Pearson Publishers.
R2 Design Data hand book. Mahadevan, CBS Publishers.
R3 Mechanical Engineering Design, JE Shingly, Tata McGraw Hill Publishers.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda (Post), Narasaraopet - 522601

DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20ME3201	DESIGN OF MACHINE ELEMENTS -2 (R20)	VI	Mechanical Engineering	5	A

COURSE OUTCOMES: Students are able to

CO1: **Apply** the design procedure to engineering problems, including the consideration of technical and manufacturing constrains of bearings. [K3]

CO2: **Identify** the loads and stresses while designing the connecting rod and crank shaft. [K3]

CO3: **Analyze** stresses on the piston and cylinder depending upon Design and proportions. [K4]

CO4: **Identify** the loads and machine members subjected and calculate static and dynamic stresses to ensure safe design. [K3]

CO5: **Compare** capacities of power transmission of Belt, Rope and Chain Drives. [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1. Apply the design procedure to engineering problems, including the consideration of technical and manufacturing constrains of bearings. [K3]		**UNIT-1: DESIGN OF BEARINGS**			
		1.1	Types of Journal bearings	T1, T2, R1,R3	2	PPT
		1.2	Lubrication, Bearing Modulus	T1, T2, R1,R3	2	Chalk, Talk, PPT
		1.3	Full and partial bearings, Clearance ratio	T1, T2, R1,R3	2	Chalk, Talk, PPT
		1.4	Heat dissipation of bearings, bearing materials	T1, T2, R1,R3	2	PPT & Tutorial
		1.5	Journal bearing design	T1, T2, R1,R3	2	Chalk, Talk, PPT & Tutorial
		1.6	Ball and roller bearings, Static loading of ball & roller bearings	T1, T2, R1,R3	2	Chalk, Talk, PPT & Tutorial
		1.7	Bearing life.	T1, T2, R1,R3	2	PPT
2	CO2: Identify the loads and stresses while designing the connecting rod and crank shaft. [K3]		**UNIT-2: DESIGN OF I.C ENGINE COMPONENTS**			
		2.1	Connecting Rod, Thrust in connecting rod,	T1, T2, R1,R3	3	Chalk, Talk, PPT
		2.2	Stress due to whipping action on	T1, T2,	2	PPT &

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	waiting line theory problems. [K4]		through 'm' machines.			
			MID I EXAMINATION			
		3.4	**WAITING LINES:** Introduction – single channel – poison arrivals – exponential service times – with infinite population and finite population models	T1, R2	4	Chalk & Talk
		3.5	multichannel – poison arrivals – exponential service times with infinite population single channel poison arrivals	T1, R2	4	Chalk & Talk
4	**CO4** **Solve** networking models and replacement problems. [K3]		**UNIT-IV**			
		4.1	**REPLACEMENT:** Replacement Model, Replacement of items that deteriorate	T1, R2	2	Chalk & Talk
		4.2	Gradually, Fail suddenly, group Replacement policy analysis, Problems	T1, T2,R2	4	Chalk & Talk
		4.3	**NETWORKING MODELS:** Earliest Completion time of a project and Critical path, Programme Evaluation Review Technique,	T1, R2	2	Chalk & Talk
		4.4	Total Slack, Free Slack, Probability of achieving completion date, Cost Analysis, Resource	T1, R2	2	Chalk & Talk
		4.5	Scheduling-Advantages, Limitations, Distinction between PERT and CPM.	T1, R2	2	Chalk & Talk
5	**CO5** **Analyze** game theory and Dynamic Programming. [K4]		**UNIT V**			
		5.1	**THEORY OF GAMES:** Introduction – mini. max (max. mini) – criterion and optimal strategy – solution of games with saddle points	T1, R3	2	Chalk & Talk
		5.2	rectangular games without saddle points – 2 x 2 games –dominance principle	T1, R3	2	Chalk & Talk
		5.3	m x 2 &2 x n games -graphical method	T1, R3	2	Chalk & Talk
		5.4	**DYNAMIC PROGRAMMING:** Introduction, Bellman's principle of optimality	T1, R3	2	Chalk & Talk
		5.5	applications of dynamic programming	T1, R3	2	Chalk & Talk
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

T1 Operations Research, S.D.Sharma, KedarNath Ram Nath Publishers

T2 Operations Research, A.M.Natarajan, P.Balasubramani and A. Tamilarasi, Pearson Education

Reference Books:

R1 Introduction to O.R, Hiller &Libermann, Tata McGraw Hill

R2 Operations Research, R.Pannerselvam, PHI Publications

R3 Operations Research, Wagner, PHI Publications

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC31OE03	OPERATIONS RESEARCH	V	Mechanical Engineering	6	A

COURSE OUTCOMES: Students are able to

SNO	Course Outcome Statement
CO1	**Illustrate** and solve linear programming problems. [K3]
CO2	**Solve** transportation and assignment problems. [K3]
CO3	**Select** a suitable sequencing and Solve Waiting line theory problems. [K4]
CO4	**Solve** networking models and replacement problems. [K3]
CO5	**Analyze** game theory & Dynamic Programming. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1: Illustrate** and solve linear programming problems. [K3]		**UNIT– I**			
		1.1	INTRODUCTION: Development-definition, characteristics and phases	T1, T2, R1	2	Chalk & Talk
		1.2	Types of operation research models, applications	T1, T2, R1	2	Chalk & Talk
		1.3	LINEAR PROGRAMMING PROBLEM: LPP Formulation,	T1, T2, R1	4	Chalk & Talk
		1.4	Graphical method, simplex method,	T1, R1	4	Chalk & Talk
		1.5	Two–phase method, big-M method, duality principle.	T1, T2, R1	4	Chalk & Talk
2	**CO2: Solve** transportation and assignment problems. [K3]		**UNIT-II**			
		2.1	**TRANSPORTATION PROBLEM:** Formulation,	T1, R1	2	Chalk & Talk
		2.2	Types of initial basic feasible solution using different methods	T1, R1	2	Chalk & Talk
		2.3	Optimal solution, unbalanced transportation problem, degeneracy.	T1, R1	2	Chalk & Talk
		2.4	**ASSIGNMENT PROBLEM:** Formulation, optimal solution	T1, T2, R2	2	Chalk & Talk
		2.5	Unbalanced assignment problem	T1, R1	2	Chalk & Talk
		2.6	Travelling salesman problem.	T1, R1	2	Chalk & Talk
3	**CO3 Select** a suitable sequencing and Solve		**UNIT-III**			
		3.1	**SEQUENCING:** Introduction, flow, shop sequencing	T1,R2	2	Chalk, Talk & PPT
		3.2	n jobs through two machines ,n jobs through three machines	T1,R2	2	Chalk & Talk
		3.3	Job-shop sequencing, and two jobs	T1, R2	2	Chalk & Talk

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	Gain knowledge on the s, trademark and copy rights		Collegiality			Talk
		4.2	Techniques for Achieving Collegiality – Senses of Loyalty	T2, R2	1	Chalk & Talk
		4.3	Consensus and Controversy - Professional and Individual Rights	T2, R2	1	Chalk & Talk
		4.4	Confidential and Proprietary Information - Conflict of Interest-Ethical egoism	T2, R2	1	Chalk & Talk, PPT
		4.5	Collective Bargaining – Confidentiality - Gifts and Bribes	T2, R2	1	Chalk & Talk
		4.6	Problem solving-Occupational Crimes	T2, R2	1	Chalk & Talk
		4.7	Industrial Espionage- Price Fixing-Whistle Blowing	T2, R2	1	Chalk & Talk
5	Summarise the engineer's responsibilities towards safety and risk. [K2].	**Unit 5. Engineers' Responsibilities towards Safety and Risk**				
		5.1	Concept of Safety - Safety and Risk	T2, R2	1	Chalk & Talk, PPT
		5.2	Types of Risks – Voluntary v/s Involuntary Risk	T2, R2	1	Chalk & Talk
		5.3	Consequences - Risk Assessment – Accountability	T2, R2	1	Chalk & Talk
		5.4	Liability - Reversible Effects	T2, R2	1	Chalk & Talk
		5.5	Threshold Levels of Risk - Delayed v/s Immediate Risk	T2, R2	1	Chalk & Talk
		5.6	Safety and the Engineer	T2, R2	1	Chalk & Talk
		5.7	Designing for Safety – Risk-Benefit Analysis-Accidents.	T2, R2	1	Chalk & Talk
				Total	30	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Professional Ethics and Morals, Prof. A.R.Aryasri, Dharanikota Suyodhana, 1/e, Maruthi Publications.
T2	Intellectual property , Deborah e. Bouchoux, 1/e, Cengage learning, New Delhi.
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Kompal Bansal & Parishit Bansal" Fundamentals of IPR for Engineers BS Publications.
R2	Cyber Law. Texts & Cases, South- western's special topics collections.
R3	M. Ashok kumar and mohd. Iqbal Ali: "Intellectual property right" serials pub.
R4	"Engineering Ethics and Human Values" by M. Govindarajan, S. Natarajan and V.S. Senthil kumar- PHI Learning PVT. Ltd-2009

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DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN- A.Y 2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC32MC2	PEHV (R20)	III/I	MECH	2	A

COURSE OUTCOMES: Student is able to

CO1: Learn necessary behavioural skills relating to the Ethics at industrial sector and to gain fundamental knowledge [K2].
CO2: Acquaint with basic human values, responsibilities and rights of engineers which are very much necessary today [K2].
CO3: Equip with knowledge on basics of intellectual property rights and cyber law [K2].
CO4: Gain knowledge on the patents, trademark and copy rights [K2].
CO5: Summarise the engineer's responsibilities towards safety and risk. [K2].

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	Learn necessary behavioural skills relating to the Ethics at industrial sector and to gain fundamental knowledge [K2].		**Unit-1. Human Values**			
		1.1	Ethics, Morals, Values, Integrity,	T1, R1	1	Chalk & Talk
		1.2	Work Ethics- Service Learning	T1, R1	1	Chalk & Talk
		1.3	Civic Virtue- Respect for Others- Living Peacefully	T1, R1	1	Chalk & Talk
		1.4	Caring- Sharing- Honesty- Courage- Value Time	T1,R1	1	Chalk & Talk
			Cooperation- Commitment – Empathy- Self-Confidence- Spirituality- Character.	T1,R1	1	Chalk & Talk,PPT
2	Acquaint with basic human , responsibilities and rights ineers which are very much ary today [K2].		**Unit-2. Engineering Ethics**			
		2.1	Professional Roles to Be Played By Engineer	T1, R1	1	Chalk & Talk
		2.2	Engineers Role As Managers,	T1, R1	1	Chalk & Talk
		2.3	Consultants And Leaders- Ethical Theories And Its Uses.	T1, R1	2	Chalk & Talk,PPT
3	Equip with knowledge on basics of intellectual property rights and cyber law [K2].		**Unit-3. Principles for Harmony**			
		3.1	Truthfulness – Customs and Traditions	T1, R1	1	Chalk & Talk
		3.2	Value Education – Human Dignity	T1, R1	1	Chalk & Talk,PPT
		3.3	Human Rights –Fundamental Duties	T1, R1	1	Chalk & Talk
		3.4	Aspirations and Harmony (I, We & Nature) – Gender Bias – Emotional Intelligence	T1, R1	1	Chalk & Talk
		3.5	Salovey – Mayer Model – Emotional Competencies – Conscientiousness.	T1, R1	2	Chalk & Talk
	MID I EXAMINATION DURING EIGTH WEEK					
4			**Unit-4. Engineers' Duties and Rights**			
		4.1	Concept of Duty - Professional Duties –	T2, R2	1	Chalk &

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	processes and conditions for different metals. (K3)					ion with models
		4.4	methods of indexing and problems	T1, T2, R3	2	Chalk & Talk, PPT& Demonstration with models
		4.5	machining time calculations.	T1	2	Chalk & Talk, PPT& Demonstration with models
5	CO2. Compare working of lathe, shaper, planer, drilling, milling and grinding machines.(K4) CO4. Select appropriate machining processes and conditions for different metals. (K3) CO5. Explain working of jigs and fixtures. (K2)	**Unit 5. FINISHING PROCESSES**				
		5.1	Theory of grinding – classification of grinding machines, different types of abrasives, bonds, specification and selection of a grinding wheel	T1, T2, R3	3	Chalk & Talk, PPT& Demonstration with models
		5.2	cylindrical and surface grinding machines, tool and cutter grinding machines	T1, T2, R3	3	Chalk & Talk, PPT& Demonstration with models
		5.3	Lapping, Honing & Broaching operations.	T1, T2, R3	3	Chalk & Talk, PPT& Demonstration with models
		6.1	Principles of jigs and fixtures, uses, classification of jigs & fixtures	T1, T2, R1	3	Chalk & Talk, PPT & Seminars
				Total	60	

TEXT BOOKS

1. Manufacturing technology II, P.N Rao, Tata Mcgraw hill publishers
2. Workshop Technology, B.S.RaghuVamshi–Vol II, Dhanpat Rai & Co

REFERENCES

1. Production Technology by H.M.T., Tata McGraw-Hill Education
2. Production Engineering, K.C Jain & A.K Chitaley, PHI Publishers
3. Production Technology, R.K. Jain and S.C. Gupta, Khanna Publisher

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DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20ME3107	Metal Cutting and Machine Tools	V	Mechanical Engineering	6	-

COURSEOUTCOMES
CO1: Define and explain theory and fundamentals of metal cutting.
CO2: Illustrate the working of lathe machines and apply machining economics.
CO3: Explain the working of Shaping, slotting, planning, drilling, boring machines and apply machining economics.
CO4: Illustrate the working of milling machines and apply machining economics.
CO5: Illustrate the working of grinding, lapping, honing and broaching processes. Explain working of jigs and fixtures

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1. Explain theory of metal cutting. (K2) CO3. Select cutting tool materials and tool geometries for different metals. (K3)		**Unit-1. FUNDAMENTALS OF MACHINING**			
		1.1	Elementary treatment of metal cutting theory -element of cutting process – geometry of single point tool angles.	T1, T2, R1	3	Chalk & Talk, PPT& Demonstration with models.
		1.2	Chip formation and types of chips – built-up edge and its effects chip breakers.	T1, T2, R1	2	Chalk & Talk, PPT& Demonstration with models
		1.3	Mechanics of orthogonal cutting – Merchant's force diagram, cutting forces, cutting speeds, feed, depth of cut and problems.	T1, T2, R1	4	Chalk & Talk, PPT& Demonstration with models
		1.4	Tool life, coolants, tool materials and problems	T1, T2	1	Chalk & Talk, PPT& Demonstration with models
2	CO2. Compare working of lathe, shaper, planer, drilling, milling and grinding machines.(K4) CO4. Select appropriate machining processes and conditions for different metals. (K3)		**Unit-2. LATHE MACHINES**			
		2.1	Engine lathe – principle of working, specification of lathe – types of lathe, constructional features of speed gear box and feed gear box	T1, T2, R3	3	Chalk & Talk, PPT Case Study
		2.2	taper turning and methods, thread turning, work holders, tool holding devices	T1, T2, R3	3	Chalk & Talk, PPT& Demonstration with models
		2.3	Turret and capstan lathes	T1, T2, R3	2	Chalk & Talk, PPT& Demonstrat

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						ion with models
		2.4	Principal features of automatic lathes – classification – single spindle and multi-spindle automatic lathes, lathe attachments	T1, T2, R3	2	Chalk & Talk, PPT& Demonstration with models
		2.5	Machining time calculations.	T2	2	Chalk & Talk, PPT& Demonstration with models
3	CO2. Compare working of lathe, shaper, planer, drilling, milling and grinding machines.(K4) CO4. Select appropriate machining processes and conditions for different metals. (K3)	**Unit-3. SHAPING, SLOTTING ,PLANNING, DRILLING & BORING MACHINES**				
		3.1	Principles of working–principal parts – specifications, operations performed on shaper machine	T1, T2, R1	2	Chalk & Talk, PPT &
		3.2	Principles of working–principal parts – specifications, operations performed on slotting machine	T1, T2, R1	2	Demonstration with models.
		3.3	Principles of working–principal parts – specifications, operations performed on planning machine	T1, T2 , R1	2	Chalk & Talk, PPT& Demonstration with models
		3.4	Twist drill and its geometry, principles of working, specifications	T1, T2, R1	2	Chalk & Talk, PPT& Demonstration with models
		3.5	types, operations performed	T1, T2	2	Chalk & Talk, PPT& Demonstration with models
		3.6	Boring Machines – fine Boring Machines – jig boring machine, Deep hole drilling Machine	T1, T2	3	Chalk & Talk, PPT& Demonstration with models
		3.7	machining time calculations.	T1, T2	2	Chalk & Talk, PPT& Demonstration with models
4	CO2. Compare working of lathe, shaper, planer, drilling, milling and grinding machines.(K4) CO4. Select appropriate machining	**Unit-4. MILLING MACHINES**				
		4.1	Principles of working – specifications – classification of Milling Machines	T1, T2, R3	3	Chalk & Talk, PPT &
		4.2	Principle features of horizontal, vertical and universal Milling Machine	T1, T2, R3	2	Demonstration with models.
		4.3	machining operations, types of cutters	T1, T2, R3	2	Chalk & Talk, PPT& Demonstrat

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Text Books:

T1 Design of Machine Elements, V.B.Bhandari, TMH Publishing Co. Ltd., New Delhi
T2 Mechanical Engineering Design, J.E.Shigley, TMH Publishing Co. Ltd., New Delhi

Reference Books:

R1 Machine Design, Pandyah and Shah, TMH Publishing Co. Ltd., New Delhi.
R2 Design Data hand book. Mahadevan, CBS Publishers.
R3 Machine Design, R.S. Khurmi & J.K.Gupta, S. Chand Publications.

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		2.4	Goodman's line	T1, T2, R1,R3	2	Chalk, Talk, PPT
		2.5	Modified Goodman's line	T1, T2, R1,R32	2	Chalk, Talk, PPT
3	CO 3. **Apply** the engineering principles for the design of simple engineering machine members such as riveted joints, welded joints.	**UNIT-3. RIVITED AND WELDED JOINTS**				
		3.1	Riveted joints- types	T1, T2, R1,R3	2	Chalk, Talk, PPT
		3.2	Failure of joints, and efficiency of joint	T1, T2, R1,R3	2	Chalk, Talk, PPT
		3.3	Welded joints-types of welded joints, strength of butt	T1, T2, R1,R3	2	Chalk, Talk, PPT
		3.4	Parallel fillet and transverse fillet welded joints	T1, T2, R1,R3	2	Chalk, Talk, PPT
		3.5	Problems	T1, T2, R1,R3	2	Chalk, Talk, PPT
MID I EXAMINATION DURING SIXTH WEEK						
4	CO 4. **Apply** the engineering principles for the design of keys, cotters and Mechanical Springs	**UNIT 4. KEYS, COTTERS AND MECHANICAL SPRINGS**				
		4.1	Types of keys, force acting on keys, Design of Keys	T1, T2, R1,R3	2	Chalk, Talk, PPT
		4.2	Types of Cotter joint-Socket & Spigot joint	T1, T2, R1,R3	2	Chalk, Talk, PPT
		4.3	Sleeve & Cotter joint	T1, T2, R1,R3	2	Chalk, Talk, PPT
		4.4	Types of springs	T1, T2, R1,R3	1	Chalk, Talk, PPT
		4.5	Stresses and deflections of helical springs	T1, T2, R1,R3	2	Chalk, Talk, PPT
		4.6	Extension and compression of springs	T1, T2, R1,R3	1	Chalk, Talk, PPT
		4.7	Springs for fatigue loading, energy storage capacity	T1, T2, R1,R3	2	Chalk, Talk, PPT
		4.8	Helical torsion springs	T1, T2, R1,R3	2	Chalk, Talk, PPT
5	CO 5. **Solve** the problems related to power transmission of shafts and shaft coupling.	**UNIT 5. POWER TRANSMISSION SHAFTS AND SHAFT COUPLINGS**				
		5.1	Design of shafts. Shafts subjected to bending	T1, T2, R1,R3	2	Chalk, Talk, PPT
		5.2	torsion and axial loading	T1, T2, R1,R3	2	Chalk, Talk, PPT
		5.3	Shafts subjected to Fluctuating loads.	T1, T2, R1,R3	2	Chalk, Talk, PPT
		5.4	Rigid couplings-muff coupling	T1, T2, R1,R3	2	Chalk, Talk, PPT
		5.5	Split muff coupling	T1, T2, R1,R3	2	Chalk, Talk, PPT
		5.6	Flange couplings	T1, T2, R1,R3	2	Chalk, Talk, PPT
		5.7	Flexible couplings-flange coupling (modified).	T1, T2, R1,R3	2	Chalk, Talk, PPT
				Total	60	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

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DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN(2024-25)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20ME3103	**DESIGN OF MACHINE ELEMENTS-1 (R20)**	V	Mechanical Engineering	6	A

S.NO	COURSE OUTCOME STATEMENT
CO1	**Analyze** the design considerations and stresses in machine members.
CO2	**Solve** the problems related to strength of machine elements.
CO3	**Apply** the engineering principles for the design of simple engineering machine members such as riveted joints, welded joints.
CO4	**Apply** the engineering principles for the design of keys, cotters and Mechanical Springs
CO5	**Solve** the problems related to power transmission of shafts and shaft coupling.

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1. **Analyze** the design considerations and stresses in machine members.		**UNIT-1. INTRODUCTION, STRESSES IN MACHINE MEMBERS**			
		1.1	General considerations in the design of Engineering Materials and their properties selection	T1, T2, R1,R3	2	Chalk, Talk, PPT
		1.2	Manufacturing consideration in design	T1, T2, R1,R3	2	Chalk, Talk, PPT
		1.3	Tolerances and fits – BIS codes of steels.	T1, T2, R1,R3	2	Chalk, Talk, PPT
		1.4	Simple stresses combined stresses, torsional bending stresses, impact stresses, stress strain relation,	T1, T2, R1,R3	2	Chalk, Talk, PPT
		1.5	Various theories of failure	T1, T2, R1,R3	2	Chalk, Talk, PPT
		1.6	Factor of safety, design for strength and rigidity, preferred numbers.	T1, T2, R1,R3	2	Chalk, Talk, PPT
2	CO 2. **Solve** the problems related to strength of machine elements.		**UNIT-2. STRENGTH OF MACHINE ELEMENTS**			
		2.1	Stress concentration, theoretical stress concentration factor, fatigue stress concentration factor notch sensitivity	T1, T2, R1,R3	2	Chalk, Talk, PPT
		2.2	Design for fluctuating stresses, endurance limit, estimation of endurance strength	T1, T2, R1,R3	2	Chalk, Talk, PPT
		2.3	Soderberg's line	T1, T2, R1,R3	2	Chalk, Talk, PPT

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		2.9	Fitting a Exponential curve	T1, T2,R2	1	Chalk &
		2.10	Fitting a Exponential curve	T1, T2,R2	1	Chalk &
		2.11	Fitting a Power Curve	T1, T2,R1	1	Chalk & Student seminar
		2.12	Fitting a Power Curve	T1, T2,R1	1	Chalk & Talk
		MID-I EXAMINATION				
3	CO-3: Apply discrete and continuous probability distributions (K3).	**UNIT-III :Probability Distributions**				
		3.1	Introduction to Probability	T1, T2, R1	1	Chalk & Talk PPT
		3.2	Conditional Probability, baye's theorem	T1, T2, R1	1	Chalk & Talk
		3.3	Discrete Random Variables	T1, T2, R1	1	Chalk & Talk,
		3.4	Continuous Random variables	T1, T2, R3	1	Chalk & Talk,
		3.5	Distribution function	T1, T2, R1	1	Chalk & Talk
		3.6	Mathematical expectation	T1, T2, R1	1	Chalk & Talk, NPTEL
		3.7	variance	T1, T2, R1	1	Chalk & Talk
		3.8	Binomial distribution	T1, T2, R3	1	Chalk & Talk Student seminar
		3.9	Poisson and uniform distribution	T1, T2, R1	1	Chalk & Talk
		3.10	Poisson and uniform distribution	T1, T2, R1	1	Chalk & Talk
		3.11	Normal Distribution	T1, T2, R1	1	Chalk & Talk
		3.12	Normal Distribution	T1, T2, R1	1	Chalk & Talk
		ASSIGNMENT-II EXAMINATION				
4	CO-4: Design the components of a classical hypothesis test (K6).	**UNIT-IV :SAMPLING THEORY**				
		4.1	Introduction Sampling Theory	T1, T2,R1	1	Chalk & Talk, PPT
		4.2	Population Vs sample	T1, T2,R1	1	Chalk & Talk
		4.3	Sampling distribution of means, variances	T1, T2,R1	1	Chalk & Talk
		4.4	Central Limit theorem	T1, T2,R1	1	Chalk & Talk
		4.5	Introduction to t distribution	T1, T2,R1	1	Chalk & Talk
		4.6	Introduction to F Distribution	T1, T2,R1	1	Chalk & Talk
		4.7	Introduction to F Distribution	T1, T2,R1	1	Chalk & Talk
		4.8	Introduction to Chi-Square Distributions	T1, T2,R2	1	Chalk & Talk
		4.9	Introduction to Chi-Square Distributions	T1, T2,R2	1	Chalk & Talk
		4.10	Point Estimation	T1, T2,R1	1	Chalk & Talk,
		4.11	Interval Estimation	T1, T2,R1	1	Chalk & Talk Student seminar
		4.12	Maximum error of estimate	T1, T2,R1	1	Chalk & Talk
5	CO-5: Infer the statistical internal methods based on small and large sample tests (K4).	**UNIT-V : TESTING OF HYPOTHESIS**				
		5.1	Introduction to Tests of Hypothesis	T1, T2, R1	1	Chalk & Talk, PPT
		5.2	Formulation of Null Hypothesis, critical region, level of significance	T1, T2,R1	1	Chalk & Talk
		5.3	One Tail, Two tailed Tests Type-I, and Type-II errors	T1, T2,R1	1	Chalk & Talk Tutorial
		5.4	Large sample test -single mean	T1, T2,R1	1	Chalk & Talk
		5.5	Large sample test -,two means	T1, T2,R1	1	Chalk & Talk
		5.6	Large sample test -single proportion	T1, T2,R1	1	Chalk & Talk
		5.7	Large sample test -Double proportion	T1, T2,R1	1	Chalk & Talk

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5.8	Small samples-Students t Test	T1, T2,R1	1	Chalk & Talk
5.9	F-Test	T1, T2,R4	1	Chalk & Talk, web resources
5.10	F-Test	T1, T2,R4	1	Chalk & Talk, web resources
5.11	Chi Square Test	T1, T2,R1	1	Chalk & Talk Student seminar
5.12	Chi Square Test	T1, T2,R1	1	Chalk & Talk
	MID-II EXAMINATION			
				TOTAL:60

Text Books:

1. Miller and Freund's, "Probability and Statistics for Engineers",7/e, Pearson, 2008.
2. S. C. Gupta and V.K. Kapoor, "Fundamentals of Mathematical Statistics", 11/e, Sultan Chand & Sons Publications, 2012.

References:

1.Shron L. Myers, Keying Ye, Ronald E Walpole, Probability and Statistics Engineers and the Scientists,8th Edition, Pearson 2007.
2. Jay l. Devore, Probability and Statistics for Engineering and the Sciences, 8 th Edition, cengage.
3. Sheldon M. Ross, "Introduction to probability and statistics Engineers and the Scientists", 4 th Edition, Academic Foundation, 2011.
4.Johannes Ledolter and Robert V. Hogg, "Applied statistics for Engineers and Physical Scientists", 3 rd Edition, Pearson, 2010.

WEB SOURCE REFERENCES:

1	https://archive.nptel.ac.in/courses/111/105/111105090/
2	https://onlinecourses.nptel.ac.in/noc21_ma74/preview
3	https://archive.nptel.ac.in/courses/111/106/111106112/
4	https://archive.org/details/NPTEL-Math-Probability_and_Statistics
5	https://onlinecourses.nptel.ac.in/noc22_ma81/preview

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		1.14	sub classes, super class, inheritance	T1	1	Chalk & Talk
		1.15	specialization,generalization using ER Diagrams.	T1	1	Chalk & Talk
		FIRST ASSIGNMENT				
2	CO 2:Analyzing relational database designing. [K4]	**Unit-2. Relational Model**				
		2.1	Introduction to relational model	T1	1	Chalk &Talk
		2.2	concepts of domain, attribute, tuple, relation	T1	2	Chalk &Talk
		2.3	importance of null values, constraints	T1	1	Chalk &Talk
		2.4	Domain, Key constraints, integrity constraints	T1	1	Chalk &Talk
		2.5	Relational Algebra	T1	2	Chalk &Talk
		2.6	Relational Calculus	T1	2	Chalk &Talk
		2.7	BASIC SQL:Simple Database schema, data types, table definitions (create, alter)	T1	2	Chalk &Talk
		2.8	different DML operations (insert, delete, update).	T1	2	Chalk &Talk
		FIRST Mid EXAMINATION				
3	CO3:Developing queries in DBMS [K3]	**Unit-3. : SQL**				
		3.1	Basic SQL querying (select and project) using where clause	T1	2	Chalk &Talk
		3.2	arithmetic & logical operations	T1	2	Chalk &Talk
		3.3	SQL functions(Date and Time, Numeric, String conversion	T1	3	Chalk &Talk
		3.4	Creating tables with relationship	T1	1	Chalk &Talk
		3.5	implementation of key and integrity constraints	T1	2	Chalk &Talk
		3.6	nested queries, sub queries, grouping, aggregation	T1	2	Chalk &Talk
		3.7	different types of joins	T1	2	Chalk &Talk
		3.8	view(updatable and non-updatable)	T1	1	Chalk &Talk
		3.9	relational set operations.	T1	1	Chalk &Talk
		SECOND ASSIGNMENT				
	CO 4: Analyzing database design methodology and normalization process [K4].	**Unit-4. Schema Refinement**				
		4.1	Purpose of Normalization or schema refinement	T1	1	Chalk &Talk
		4.2	concept of functional dependency	T1	1	Chalk &Talk
		4.3	normal forms based on functional dependency	T1	2	Chalk &Talk

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4		4.4	Lossless join and dependency preserving decomposition	T1	1	Chalk & Talk
		4.5	1NF, 2NF and 3 NF	T2	1	Chalk & Talk
		4.6	concept of surrogate key, Boyce-Codd normal form(BCNF)	T1	2	Chalk & Talk
		4.7	MVD, Fourth normal form(4NF), Fifth Normal Form (5NF).	T1	2	Chalk & Talk
			Unit 5. Transaction Concept			
5	**CO5:** Analyze transaction concepts and File indexing. [K2]	5.1	Transaction State, ACID properties	T1	1	Chalk & Talk
		5.2	Concurrent Executions, Serializability, Recoverability	T1	2	Chalk & Talk
		5.3	Implementation of Isolation	T1	1	Chalk & Talk
		5.4	Testing for Serializability	T1	1	Chalk & Talk
		5.5	lock based, time stamp based, optimistic	T1	1	Chalk & Talk
		5.6	concurrency protocols	T1	1	Chalk & Talk
		5.7	Deadlocks	T2	1	Chalk & Talk
		5.8	Failure Classification	T2	1	Chalk & Talk
		5.9	Storage, Recovery and Atomicity	T1	1	Chalk & Talk
		5.10	Recovery algorithm	T1	1	Chalk & Talk
		5.11	Introduction to Indexing Techniques: B+ Trees	T1	1	Chalk & Talk
		5.12	operations on B+Trees	T1	1	Chalk & Talk
		5.13	Hash Based Indexing	T2	1	Chalk & Talk
						TOTAL NUMBER OF HOURS: 68
			SECOND MID EXAMINATION			
			END EXAMINATIONS			

TEXT BOOKS:

1. Database Management Systems, 3rd edition, Raghurama Krishnan, Johannes Gehrke, TMH (For Chapters 2, 3, 4)
2. Database System Concepts,5th edition, Silberschatz, Korth, Sudarsan.TMH (For Chapter 1 and Chapter 5)

REFERENCE BOOKS:

1. Introduction to Database Systems, 8thedition, C J Date, Pearson.
2. Database Management System, 6th edition, RamezElmasri, Shamkant B. Navathe, Pearson
3. Database Principles Fundamentals of Design Implementation and Management, Corlos Coronel, Steven Morris, Peter Robb, Cengage Learning.

WEB-RESOURCES:

1. https://nptel.ac.in/courses/106/105/106105175/
2. https://infyspringboard.onwingspan.com/web/en/app/toc/lex_auth_0127580666728202456_shared/overview

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LESSON PLAN (COMMON TO ALL BRANCHES)

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R23CC21MC	ENVIRONMENTAL STUDIES (R23)	III	Mechanical	2	....

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
1	CO:1 Understand multi-disciplinary nature of environmental studies and Analyze the natural resources and their importance for the sustenance of the life and recognize the need to conserve the natural resources.(K2)	**Unit-1. Multidisciplinary nature of Environmental Studies**				
		1.1	Multidisciplinary Nature of Environmental Studies: – Definition, Scope and Importance – Need for Public Awareness.	T1, T2, R1	1	Chalk& Talk
		1.2	Natural Resources : Renewable and non-renewable resources – Natural resources and associated problems	T1, T2, R1	1	Chalk& Talk
		1.3	Forest resources – Use and over – exploitation, deforestation, case studies – Timber extraction	T1, T2, R1	2	Active learning & PPT
		1.4	Mining, dams and other effects on forest and tribal people – Water resources – Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems	T1	2	PPT
		1.5	Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.	T1, T2, R1	1	Active learning & PPT
2	CO2: Explain the concepts of the ecosystem and its function in the environment. The	**Unit-2.** Ecosystems				
		2.1	Concept of an ecosystem. – Structure and function of an ecosystem – Producers, consumers and decomposers – Energy flow in	T1, T2, R3	2	Active learning & PPT

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	need for protecting the producers and consumers in various ecosystems and their role in the food web. Explain the biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity. (K2)		the ecosystem – Ecological succession mining, dams and effects on forest and tribal people.			
		2.2	Food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the following ecosystem:	T1, T2, R3	2	PPT & Case Study
		2.3	a. Forest ecosystem. b. Grassland ecosystem c. Desert ecosystem	T1, T2, R3	1	Chalk& Talk
		2.4	d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) Biodiversity and Its Conservation : Introduction and Definition: genetic, species and ecosystem diversity.	T1, T2, R3	1	Chalk& Talk
		2.5	Bio-geographical classification of India Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values	T1	1	Chalk& Talk
		2.6	Biodiversity at global, National and local levels – Hot-sports of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts	T1, T2, R1	1	Chalk& Talk
3	CO3: Distinguish various attributes of the pollution, their impacts and measures to reduce or control the pollution along with waste management(K2)	**Unit-3.** Environmental Pollution:				
		3.1	Environmental Pollution: Definition, Cause, effects and control measures of: a. Air Pollution.	T1, T2, R1	1	Chalk& Talk
		3.2	Definition, Cause, effects and control measures of: b.Water pollution c.Soil pollution	T1, T2, R1	1	Chalk& Talk
		3.3	d.Marine pollution e.Noise pollution	T1, T2, R1	1	Active learning & PPT

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		3.4	Solid Waste Management: Causes, effects and control measures of urban and industrial wastes	T1, T2, R1	1	PPT
		3.5	Role of an individual in prevention of pollution – Pollution case studies	T1, T2, R1	1	Tutorial
		3.6	Disaster management: floods, earthquake, cyclone and landslides.	T1, T2, R1	1	Tutorial & PPT
4	CO4: Understand the rainwater harvesting, watershed management, and ozone layer depletion and waste land reclamation. (K2))	**Unit-4.** Social Issues and the Environment:				
		4.1	Social Issues and the Environment: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershedmanagement	T1, T2, R3	2	Chalk& Talk, Industrial Visit
		4.2	Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies	T1, T2, R3	2	PPT
		4.3	Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act	T1, T2, R3	2	Chalk& Talk, Case Study
		4.4	Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.	T1, T2, R3	1	Tutorial, PPT
5	CO 5: Illustrate the causes of population explosion, value education and welfare programmes. (K3).	**Unit 5.** Human Population And The Environment:				
		5.1	Population growth, variation among nations. Population explosion	T1, T2, R3	1	PPT, Chalk& Talk
		5.2	Family Welfare Programmes. – Environment and human health	T1, T2, R3 T1	1	PPT Active learning & PPT
		5.3	Human Rights – Value Education – HIV/AIDS	T1, T2, R3	1	Case Study & PPT
		5.4	Women and Child Welfare	T1, T2, R1	1	Chalk& Talk
		5.5	Role of information Technology in Environment and human health – Case	T1, T2, R1	1	Chalk& Talk

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		studies.			
	5.6	Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, and birds – river, hill slopes, etc.	T1, T2, R1	1	Chalk& Talk, Active Learning
			Total	**34**	

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	Erach Bharucha,Textbook of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
T2	Palaniswamy, Environmental Studies, 2/e, Pearson education, 2014.
T3	S.Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.
T4	K.Raghavan Nambiar, "Text book of Environmental Studies for UndergraduateCourses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010. .

REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e,Cengage Publications, 2012.
R2	M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BSPublication, 2014.
R3	J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering,Prentice Hall of India Private limited, 1988.
R4	G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House,2018.
R5	Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineeringand Science, 1/e, Prentice Hall of India Private limited, 1991

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DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC4OE06	MECHATRONICS	VII	Mechanical Engineering	6	A

COURSE OUTCOMES: Students are able to

SNO	Course Outcome Statement
CO1	**Discuss** the elements of a microcontroller as well as the operating principles of motors, sensors, and circuits commonly used in mechatronic devices.[K4]
CO2	**Describe** the basics of Semiconductors used in mechatronics. [K2]
CO3	**Analyze** the Sensors and Transducers for different applications.[K4]
CO4	**Analyze** different logics ad logical controls.[K4]
CO5	**Apply** the concepts of mechatronics for various applications.[K3]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1:** **Discuss** the elements of a microcontroller as well as the operating principles of motors, sensors, and circuits commonly used in mechatronic devices.[K4]		**UNIT– I : INTRODUCTION**			
		1.1	Multi-disciplinary Scenario, Origins, Evolution of Mechatronics	T1, T2, R1	2	Chalk & Talk, PPT
		1.2	An overview of Mechatronics, Introduction to Manufacturing, Design.	T1, T2, R1	2	Chalk & Talk, PPT
		1.3	System modelling: Introduction, system modelling, mechanical system, translational mechanical system with spring, damper and mass	T1, T2, R1	2	Chalk & Talk, PPT, NPTEL/MOOCS
		1.4	Rotational mechanical system with spring, damper and mass; electrical system, modelling electric motor	T1, T2, R1	2	Chalk & Talk, PPT
		1.5	fluid system, thermal systems, modeling pneumatic actuator	T1, T2, R1	2	Chalk & Talk, PPT
2	**CO2:** **Describe** the basics of Semiconductors used in mechatronics. [K2]		**UNIT-II: SEMICONDUCTORS AND ELECTRONICS**			
		2.1	Semiconductors	T1, T2, R2	1	Chalk & Talk, PPT, Quiz
		2.2	PN junction diode-types, BJT, DIAC, TRIAC, LEDs	T1, T2, R2	3	Chalk & Talk, PPT, Quiz
		2.3	Transistors, FET, MOSFET	T1, T2, R1	3	Chalk & Talk, PPT
		2.4	Transistors, SCR, IC, DC	T1, T2, R2	3	Chalk & Talk, PPT
3	**CO3:**		**UNIT-III: SENSORS AND TRANSDUCERS**			
		3.1	Introduction and background, difference between transducer and sensor	T1,R2	2	Chalk & Talk, PPT

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	Analyze the Sensors and Transducers for different applications.[K4]	3.2	Transducers types, transduction principle	T1,R2	2	Chalk & Talk, PPT
		3.3	Photoelectric transducers, thermistors, thermo devices, thermo couple	T1, R2	2	Chalk & Talk, PPT
		3.4	Inductive transducers, capacitive transducers, pyro electric transducers	T1, R2	2	Chalk & Talk, PPT
		3.5	Piezoelectric transducers, Hall-effect transducers, Fibre optic transducers.	T1, R2	2	Chalk & Talk, PPT
4	**CO4: Analyze** different logics ad logical controls.[K4]	**UNIT-IV: DIGITAL LOGIC & PLC**				
		4.1	Digital logic	T1, T2,R2	2	Chalk & Talk, Virtual Lab
		4.2	Number systems, logic gates	T1, T2, R2	2	Chalk & Talk, Virtual Lab
		4.3	Boolean algebra, karnaugh maps	T1, T2, R2	2	Chalk & Talk, Virtual Lab
		4.4	Application of logic gates, sequential logic	T1, T2, R2	2	Chalk & Talk, Virtual Lab
		4.5	Programmable logic controller (PLC)	T1, T2, R2	2	Chalk & Talk, Virtual Lab
5	**CO5: Apply** the concepts of mechatronics for various applications.[K3]	**UNIT V: APPLICATIONS IN MECHATRONICS**				
		5.1	Sensors for condition monitoring,	T1, R2	3	Chalk & Talk, Web Resources
		5.2	Mechatronic control in automated manufacturing	T1, R2	2	Chalk & Talk, Web Resources
		5.3	Artificial intelligence in mechatronics	T1, R2	3	Chalk & Talk, Web Resources
		5.4	Fuzzy logic applications in mechatronics, micro sensors in mechatronics	T1, R2	2	Chalk & Talk, Web Resources
				Total	50	
END EXAMINATIONS						

Text Books:

T1 Mechatronics - Electronic Control Systems in Mechanical and Electrical Engineering (2010), W. Bolton, Pearson Education.

T2 Mechatronics system design by DevdasShetty and Richard A. Kolk, PWS publishing company

Reference Books:

R1 Mechatronics: Principles, concepts and applications by Nitaigour Premchand Mahalik, Tata – McGraw Hill Publishing Company Ltd.

R2 Mechatronics: Integrated Mechanical Electronic Systems by K.P. Ramchandran, G.K. Vijyaraghavan, M.S. Balasundaram, Willey Publication, 2008

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3	CO3 **Elaborate** steering mechanisms. (K6)	3.2	materials, front wheel geometry viz., camber, castor, kingpin inclination, toe-in and toe-out, Wheel alignment and balancing	T1,R2	2	Chalk, Talk & PPT
		3.3	Condition for true rolling motion off-road wheels during steering.	T1, R2	2	Chalk, Talk & PPT
		MID I EXAMINATION				
		3.4	Steering geometry. Ackermann and Davis steering.	T1, R2	4	Chalk, Talk & PPT
		3.5	Construction details of steering linkages. Different types of steering gear box	T1, R2	4	Chalk, Talk & PPT
4	CO4 **Analyze** different braking and suspension mechanisms. (K4)	**UNIT-IV: BRAKING & SUSPENSION**				
		4.1	Type of brakes, Principles of shoe brakes, Constructional details – materials	T1, R2	2	Chalk, Talk & PPT
		4.2	Disc brake, drum brake theory, constructional details, advantages, Brake actuating systems	T1, T2,R2	4	Chalk, Talk & PPT
		4.3	Factors affecting brake performance, Parking & Exhaust brakes, power & power assisted brakes,	T1, R2	2	Chalk, Talk & PPT
		4.4	Antilock Breaking System (ABS), Testing of brakes	T1, R2	2	Chalk, Talk & PPT
		4.5	Types of suspension, factors influencing ride comfort, types of suspension springs (leaf & coil springs).	T1, R2	2	Chalk, Talk & PPT
5	CO5 **Apply** the knowledge of electrical systems in the automotive vehicles. (K3)	**UNIT V: ELECTRICAL SYSTEM:**				
		5.1	Battery, Charging circuit, Alternator, generator,	T1, R3	2	Chalk, Talk & PPT
		5.2	current – voltage regulator – starting systems	T1, R3	2	Chalk, Talk & PPT
		5.3	mechanism solenoid switch, lighting systems, Horn, wiper, fuel gauge	T1, R3	2	Chalk, Talk & PPT
		5.4	oil pressure gauge, engine temperature	T1, R3	2	Chalk, Talk & PPT
		5.5	Indicator, wiring harness, Trouble shooting.	T1, R3	2	Chalk, Talk & PPT
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

T1 Heinz Heisler, "Advanced Vehicle Technology", second edition, Butterworth – Heinemann, New York, 2002. 1999.

T2 Kirpal Singh, "Automobile Engineering", Standard publishers, Distributors, Delhi,

Reference Books:

R1 G.B.S.Narang, "Automobile Engineering", Khanna Publishers, Twelfth reprint New Delhi, 2005.

R2 R.P.Sharma, "Automobile Engineering", Dhanpat Rai & Sons, New Delhi, 2000

R3 K.K. Ramalingam, "Automobile Engineering ", Scitech Publications (India) PVT.

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DEPARTMENT OF MECHANICAL ENGINEERING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC3OE05	AUTOMOTIVE VEHICLES	VII	Mechanical Engineering	6	A

COURSE OUTCOMES: Students are able to

SNO	Course Outcome Statement
CO1	**Illustrate** different types of chassis and body parts. (K2)
CO2	**Examine** the transmission systems and accessories used in automobiles. (K4)
CO3	**Elaborate** steering mechanisms. (K6)
CO4	**Analyze** different braking and suspension mechanisms. (K4)
CO5	**Apply** the knowledge of electrical systems in the automotive vehicles. (K3)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1: Illustrate** different types of chassis and body parts. (K2)		**UNIT– I : CHASSIS AND BODY**			
		1.1	Classification of vehicle, layout with reference to power plant, steering location and drive	T1, T2, R1	4	Chalk, Talk & PPT
		1.2	chassis, construction and details (frames, sub-frames, defects in frame, frameless vehicles, vehicle dimensions)	T1, T2, R1	4	Chalk, Talk & PPT
		1.3	details of chassis & body materials, Integrated body construction	T1, T2, R1	2	Chalk, Talk & PPT
		1.4	Vehicle interior system (dash board & seating system), head roofs.	T1, R1	2	Chalk, Talk & PPT
2	**CO2: Examine** the transmission systems and accessories used in automobiles. (K4)		**UNIT-II: TRANSMISSION & DRIVELINE**			
		2.1	Clutches, principle, types, Fluid coupling and torque convertors,	T1, R1	2	Chalk, Talk & PPT
		2.2	Problems on performance of automobile such as resistance to motion, tractive efforts, engine speed, power and acceleration requirements.	T1, R1	2	Chalk, Talk & PPT
		2.3	Determination of gear box ratios for different vehicle applications,	T1, R1	2	Chalk, Talk & PPT
		2.4	different types of gear boxes, Automatic transmission,	T1, T2, R2	2	Chalk, Talk & PPT
		2.5	Effect of driving thrust and torque-reaction,	T1, R1	2	Chalk, Talk & PPT
		2.6	Hotchkiss drives, Torque tube drive, radius rods, Propeller shaft, Universal joints,	T1, R1	2	Chalk, Talk & PPT
			UNIT-III : FRONT AXLE & STEERING:			
		3.1	Front axle types, rigid axle and split axle, constructional details,	T1,R2	2	Chalk, Talk & PPT

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		2.3	impact of modern drive-trains on energy supplies	T1, T2, R3	2	Chalk & Talk, Tutorial
		HYBRID ELECTRIC DRIVE-TRAINS				
		2.4	Basic concept of hybrid traction, introduction to various hybrid drive-train topologies	T1, T2, R3	2	Chalk & Talk, Quiz
		2.5	power flow control in hybrid drive-train topologies	T1, T2, R3	2	Chalk & Talk, PPT
		2.6	fuel efficiency analysis	T1, T2, R3	2	Chalk & Talk, PPT
		Unit-3. ELECTRIC DRIVE TRAINS				
3	CO3: Identify different types of nozzles used in steam turbines [K3]	3.1	Basic concept of electric traction, introduction to various electric drive train topologies	T1, T2, R1	3	Chalk & Talk, PPT, Tutorial
		3.2	power flow control in electric drive-train topologies	T1, T2, R1	3	Chalk & Talk, Tutorial
		3.3	fuel efficiency analysis	T1, T2, R1	2	Chalk & Talk, PPT
MID I EXAMINATION						
ELECTRIC PROPULSION UNIT						
3	CO3: Identify different types of nozzles used in steam turbines [K3]	3.4	Introduction to electric components used in hybrid and electric vehicles, Configuration and control of DC Motor drives, Induction Motor drives	T1, T2, R1	3	Chalk & Talk, NPTEL
		3.5	configuration and control of Permanent Magnet Motor drives, Switch Reluctance Motor drives, drive system efficiency	T1,R1	3	Chalk & Talk, Quiz
		Unit-4. TYPES OF STORAGE SYSTEMS				
4	CO4: Classify different turbines based on utility and applications[K2]	4.1	Introduction to Energy Storage Requirements in Hybrid and Electric Vehicles	T1, T2, R3	2	Chalk & Talk, PPT
		4.2	Battery based energy storage and its analysis	T1, T2, R3	2	Chalk & Talk, Quiz
		4.3	Fuel Cell based energy storage and its analysis	T1, T2, R3	3	Chalk & Talk, NPTEL
		4.4	Super Capacitor based energy storage and its analysis	T1, T2, R3	2	Chalk & Talk, Case Study
		4.5	Flywheel based energy storage and its analysis	T1, T2, R3	3	Chalk & Talk, Case Study
		4.6	Hybridization of different energy storage devices, Sizing the drive System	T1, T2, R3	2	Chalk & Talk, Tutorial
5	CO5: Report different features	**Unit 5. MODELLING OF HYBRID ELECTRIC VEHICLE RANGE**				

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	of gas turbines and jet engines[K2]	5.1	Driving Cycles, Types of Driving Cycles	T1, T2, R1	2	Chalk & Talk, PPT
		5.2	Range modelling for Battery Electric Vehicle	T1, T2, R1	2	Chalk & Talk, NPTEL
		5.3	Hybrid (ICE & others), Fuel Cell EV	T1, T2, R1	2	Chalk & Talk, Quiz
		5.4	Solar Powered Vehicles	T1, T2, R1	2	Chalk & Talk, Tutorial
		5.5	Case study of 2 wheeler, 3 wheeler and 4 wheeler vehicles	T1, R1	3	Chalk & Talk, Case Study
				Total	65	
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

T1 James Larminie, J. Lowry, "Electric Vehicle Technology Explained", John Wiley & Sons Ltd. 2003.

T2 M. Ehsani, Y. Gao, S. E. Gay and A. Emadi, "Modern Electric, Hybrid Electric, and Fuel Cell Vehicles: Fundamentals, Theory, and Design", CRC Press, 2004

Reference Books:

R1 S.Onori, L.Serrao and G.Rizzoni, "Hybrid Electric Vehicles: Energy Management Strategies", Springer, 2015.

R2 Iqbal Hussein, "Electric and Hybrid Vehicles: Design Fundamentals", CRC Press, 2003.

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DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20CC4117	Entrepreneurship and Innovation	IV-I	Mechanical Engineering	6	A

COURSE OUTCOMES: Students are able to

S. No.	Course Outcome Statement
CO1	**Outline** the concepts of Entrepreneurship (K2)
CO2	**Create** the awareness on creativity and innovation (K6)
CO3	**Adapt** the Entrepreneurship Development programs (K6)
CO4	**Evaluate** the project planning and feasibility studies (K5)
CO5	**Analyze** the concept of small and micro enterprises (K4)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1: **Outline** the concepts of Entrepreneurship (K2)	**Unit-1.** ENTREPRENEUR AND ENTREPRENEURSHIP				
		1.1	Entrepreneur – Definitions, concept of entrepreneur	T1, T2, R1	3	Chalk, Talk & PPT
		1.2	Characteristics of entrepreneur, Types of entrepreneurs, concept of entrepreneurship,	T1, T2, R1	3	Chalk, Talk & PPT
		1.3	Characteristics of entrepreneurship, Role of entrepreneurship in economic development	T1, T2, R2	3	Chalk, Talk & PPT
		1.4	Ethics and social responsibilities of an entrepreneur	T1, T2, R1	3	Chalk, Talk & PPT
		1.5	Financial institutional support to entrepreneurs (IDBI, SISI,DIC, NIESBUD, Commercial banks etc.,	T1, T2, R1	3	Chalk, Talk & PPT
2	CO 2: **Create** the awareness on creativity and innovation (K6)	**Unit-2** CREATIVITY AND INNOVATION IN ENTREPRENEURSHIP				
		2.1	Meaning and concept of creativity	T1, T2, R4	2	Chalk, Talk & PPT
		2.2	Nature and characteristics of creativity	T1, T2, R4	2	Chalk, Talk & PPT
		2.3	Creativity Process- Factors affecting creativity	T1, T2, R4	2	Chalk, Talk & PPT
		2.4	Meaning and Importance Innovation Process	T1, T2, R4	2	Chalk, Talk & PPT
		2.5	Distinguish the Creativity and Innovation	T1, T2, R4	2	Chalk, Talk & PPT

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3	CO 3: **Adapt** the Entrepreneurship Development programs (K6)	**Unit-3. ENTREPRENEURSHIP DEVELOPMENT PROGRAMMES**				
		3.1	Designing Appropriate Training Programme to inculcate Entrepreneurial Spirit	T1, T2, R1	2	Chalk, Talk & PPT
		3.2	Training for Entrepreneurs	T1, T2, R1	2	Chalk, Talk & PPT
		3.3	Entrepreneurship Development Programme (EDP)	T1, T2, R1	2	Chalk, Talk & PPT
		3.4	Need and objectives of EDP's	T1, T2, R1	3	Chalk, Talk & PPT
		3.5	Phases and evolution on EDP's existing and new Entrepreneurs.	T1, T2, R2	3	Chalk, Talk & PPT
4	CO 4: **Evaluate** the project planning and feasibility studies (K5)	**Unit 4.** PROJECT PLANNING AND FEASIBILITY STUDIES				
		4.1	Meaning of a project, Project identification	T1, T2, R3	2	Chalk & Talk
		4.2	Sources of new Ideas, Methods of generating ideas,	T1, T2, R3	2	Chalk & Talk
		4.3	Project selection, - Project Feasibility Study	T1, T2, R3	2	Chalk & Talk
		4.4	Project evaluation and Techniques (PBP, ARR,).	T1, T2, R3	2	Chalk & Talk
		4.5	Project evaluation and Techniques (NPV, IRR & PI).	T1, T2, R3	4	Chalk ,Talk,
5	CO 5. **Analyze** the concept of small and micro enterprises (K4)	**Unit 5. SMALL AND MICRO ENTERPRISES**				
		5.1	Importance, definitions, MSME's Development Act 2006	T1, T2, R1	2	Chalk, Talk & PPT
		5.2	Policies and their support to MSMEs	T1, T2, R1	2	Chalk, Talk & PPT
		5.3	Growth of Firm and growth strategies	T1, T2, R1	3	Chalk, Talk & PPT
		5.4	Factors inducing growth	T1, T2, R1	2	Chalk, Talk & PPT
		5.5	Sickness in small business and remedies	T1, T2, R1	2	Chalk, Talk & PPT
				Total	60	
MID II EXAMINATIONS						
END EXAMINATIONS						

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	"Entrepreneurship", Arya Kumar: Pearson, Publishing House, New Delhi, 2012
T2	"Entrepreneurship', VSP Rao, Kuratko: Cengage Learning, New Delhi,2012
T3	ShoimoMaital, DVR Seshadri, "Innovation Management", Response Books 2007
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	"Entrepreneurship Development" B.Janakiram, M Rizwana: Excel Books, ND, 2011
R2	"Entrepreneurship Development", P.C.Shejwalkar Everest Publishing House, ND, 2011
R3	Vinnie Jauhari& Sudhanshu Bhushan, "Innovation Management", Oxford University Press, 2014

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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601**

DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN A.Y.2024-25

Course Code	Course Title (Regulation)	Sem	Credits	Branch	Contact Periods/Week	Sections
R24MBA101	**Management & Organizational Behavior (R24)**	**I**	**4**	**MBA**	**5**	**1**

LTP 4-0-0
Cr 4

COURSE OUTCOMES: The student is able to

CO1: Examine the Management concepts and functions. [K4]
CO2: Apply the concepts of Controlling. [K3]
CO3: Apply the concepts of Personality and Attitudes in real life situations. [K3]
CO4: Analyse Leadership Styles and Challenges in globalized era. [K4]
CO5: Evaluate the basic concepts of organisational conflicts and climate. [K5]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Examine the Management concepts and functions. [K4]	**UNIT-1 INTRODUCTION TO MANAGEMENT**				
		1.1	Definition, Nature, Functions of Management, Importance of Management	T1, T3	15	Chalk & Talk, PPT, Case Study
		1.2	Evolution of Management thought,, Scientific management	T1, T3		
		1.3	administrative management, Haw throne experiments	T1, T2		
		1.4	systems approach, Managerial Skills, Levels of Management	T1, T3		
		1.5	Planning, steps, process, Importance, Limitations	T1, T3		
		1.6	types of plans, Characteristics of a sound plan	T1, T2		
		1.7	. Management By Objectives (MBO)	T1, T3		
		1.8	Techniques and Processes of Decision Making	T1, T2		
		1.9	Social Responsibilities of Business	T1, T2		
2	CO2: Apply the concepts of Controlling. [K3]	**UNIT-2 Organizing**				
		2.1	Organizing, Principles of organizing, Organization Structure and Design	T1, T3	16	Chalk &Talk, PPT, Case Study
		2.2	Types of power, Delegation of Authority	T1, T2		
		2.3	Factors affecting delegation	T1, T2		
		2.4	Span of control, De centralization, Line and staff structure conflicts	T1, T2		

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		2.5	Coordination definition and principles	T1, T3		
		2.6	Emerging Trends in Corporate Structure	T1, T3		
		2.7	Formal and Informal Organization, Nature and importance of controlling	T1, T2		
	MID I EXAMINATION DURING EIGHTH WEEK					
		2.8	Process of controlling, requirements of effective controlling	T1, T3		
		2.9	Controlling techniques	T1, T3		
3	CO3: Apply the concepts of Personality and Attitudes in real life situations. [K3]	**UNIT-3. Organizational Behavior**				
		3.1	Organizational behaviour, Nature and scope	T1, T3	16	Chalk &Talk, PPT, Case Study
		3.2	Linkages with other social sciences, Individual roles and organizational goals	T1, T3		
		3.3	perspectives of human behavior, Perception	T1, T3		
		3.4	perceptual process, Learning, Process	T1, T3		
		3.5	Theories, Personality, Individual Difference	T1, T2		
		3.6	Types of Individual Difference, Determinants of Personality	T1, T3		
		3.7	Values, Attitudes, Beliefs	T1, T3		
		3.8	Creativity, Creative thinking	T1, T2		
4	CO4: Analyse Leadership Styles and Challenges in globalized era. [K4]	**UNIT-4.** Motivation and Job Performance				
		4.1	Motivation and Job Performance, Content and process	T1, T3	12	Chalk &Talk, PPT, Case Study
		4.2	Theories of Motivation, Leadership Styles	T1, T3		
		4.3	Approach's, Challenges of leaders in globalized era	T1, T3		
		4.4	Groups. stages formation of groups, group dynamics	T1, T3		
		4.5	Collaborative Processes in Work Groups,	T1, T2		
		4.6	Johari Window, Transactional Analysis	T1, T3		
5	CO5: Evaluate the basic concepts of organisational conflicts and climate. [K5]	**UNIT-5.** Organizational conflict				
		5.1	Organizational conflict, causes and consequences	T1, T3	09	Chalk &Talk, PPT, Case Study
		5.2	conflict and Negotiation Team Building	T1, T3		
		5.3	Conflict Resolution in Groups, problem-solving Techniques	T1, T3		
		5.4	Organizational change, Change	T1, T3		

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			process			
		5.5	resistance to change, Creating an Ethical Organization	T1, T3		
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:-

1. Harold Koontz, Heinz Weihrich, A.R.Aryasri, Principles of Management, TMH, 2010.
2. Dilip Kumar Battacharya, Principles of Management, Pearson, 2012.
3. Kumar, Rao, Chhaalill "Introduction to Management Science" Cengage Delhi
4. V.S.P.Rao, Management Text and Cases, Excel, Second Edition, 2012.
5. K.Anbuvelan, Principles of Management, University Science Press, 2013.

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DEPARTMENT OF MASTER OF BUSINESS ADMINISTRATION
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections	Credits
R24MBA102	Managerial Economics (R24)	I	MBA	5	A & B	4

COURSE OUTCOMES:

CO1: Explain the economic meaning of price, elasticity, and production costs. Describe the cause and effect of changes in all of these variables.[K1]

CO2: Draw and analyze cost and revenue curves that maximize profit. [K3]

CO3: Discuss differences and critically analyze the pros and cons of different market structures, including competitive, monopolistic and oligopolistic markets. [K3]

CO4: Pricing strategies to achieve and applicability in the market conditions [K2]

CO5: Knowledge about macroeconomics conditions and learn to applicable in the present context. [K1]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT-1. Introduction to Managerial Economics			
1	CO1: Explain the economic meaning of price, elasticity, and production costs. Describe the cause and effect of changes in all of these variables.[K1]	1.1	Nature and Scope- of managerial Economics	T1, T2, R1	12	Chalk & Talk, PPT, Active Learning & Tutorial
		1.2	Incremental reasoning, Concept of Time Perspective	T1, T2, R1		
		1.3	Discounting Principle, Opportunity Cost Principle	T1, T2, R1		
		1.4	Equi -Marginal Concept-Theory of Firm	T1, T2, R1		
		1.5	Profit measurement-social responsibility of business, **Case Study.**	T1, T2, R1		
			UNIT-2 Demand Analysis and Forecasting			
2	CO2: Draw and analyze cost and revenue curves that maximize profit. [K3]	2.1	Concepts of Demand, Supply	T1, T2, R2	12	Chalk & Talk, PPT Tutorial, Active Learning
		2.2	Determinants of Demand and Supply, Elasticities of Demand and Supply	T1, T2, R1		
		2.3	Methods of demand forecasting for established	T1, T2, R2		
		2.4	Methods of demand forecasting for new products, **Case Study.**	T1, T2, R2		
			UNIT-3. Cost and Production Analysis			
3	CO3:Discuss differences and critically analyze the pros and cons of different market structures, including	3.1	Cost Concept and types	T1, T2, R1	13	Chalk & Talk, PPT, Tutorial
		3.2	Cost-Output Relationships, Cost Estimation, Reduction and Control	T1, T2, R1		
		3.3	Economies and Diseconomies of			

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	competitive, monopolistic and oligopolistic markets. [K3]		Scale	T1, T2, R1		
		3.4	Law of Variable Proportions, Returns to Scale- Isoquants-Cobb-Douglas and CES Production functions, **Case Study.**	T1, T2, R1		
4	CO4:Pricing strategies to achieve and applicability in the market conditions [K2]		**UNIT-4: Theory of Pricing**			
		4.1	Price determination under Perfect Competition, Monopoly	T1, T2, R2	12	Chalk & Talk, PPT & Tutorial,
		4.2	Oligopoly and Monopolistic Competitions	T1, T2, R2		
		4.3	Market structures: Perfect and Imperfect Market Structurer. Price discrimination-degrees of price discrimination.	T1, T2, R1		
		4.4	Methods of Pricing, **Case Study.**	T1, T2, R1		
5	CO5: Knowledge about macroeconomics conditions and learn to applicable in the present context. [K1]		**UNIT 5 : Macro Economics and Business**			
		5.1	Macro Economics Concept, Nature and Measurement of National Income.	T1, T2, R2	10	Chalk & Talk, PPT, Tutorial, & Seminars
		5.2	Fiscal and Monetary Policies.	T1, T2, R1		
		5.3	Inflation and Deflation: Inflation - Meaning and Kinds, Types, Causes and measurement of inflation Measures to Control Inflation,	T1, T2, R1		
		5.4	Deflation- - Philips curve-Stagflation-Theory of Employment	T1, T2, R1		
		5.5	Business cycles: Policies to counter Business Cycles, **Case Study.**	T1, T2, R1		
				Total	59	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1 : D.M.Mithani, Managerial Economics, Himalaya Publishing House

T2 : P.L. Mehta, Managerial Economics, PHI, 2001.

Reference Books:

R1 : Gupta G.S., Managerial Economics, TMH, 1988.

R2 : D.N. Dwivedi, Managerial Economics, 7th Ed, Vikas Publishing.

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DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN

Academic year	Regulation	Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
2024-25	R24	R24MBATH103	AFM (R24)	I	MBA	5	I

COURSE OUTCOMES: Student is able to

CO1: Prepare the basic books of accounting and financial statement of the company to ascertain profit or loss and to understand the financial position of the company [K3]
CO2: Apply financial analysis techniques of funds flow analysis, cash flow analysis and ratio analysis for the assessment of financial performance of the company. [K3]
CO3: Apply the cost concepts for preparation of cost sheet and inventory valuation methods [K3]
CO4: Evaluate the use of budgetary control in the managerial decision making [K5]
CO5: Differentiate Standard costing and Marginal costing K3]

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
1	CO1: Prepare the basic books of accounting and financial statement of the company to ascertain profit or loss and to understand the financial position of the company [K3]	**UNIT-1**				
		1.1	Financial Accounting- concept, Importance and scope	T1, R1	2	Chalk & Talk, PPT, & Tutorial
		1.2	accounting principles: Accounting concepts and conventions	T1, R1	2	
		1.3	Accounting cycle and journal	T1, R1	5	
		1.4	ledger	T1, R1	2	
		1.5	Trial balance	T1, R1	2	
		1.6	Preparation of final accounts with adjustments	T1, R1	6	
2	CO2: Apply financial analysis techniques of funds flow analysis, cash flow analysis and ratio analysis for the assessment of financial performance of the company. [K3]	**UNIT-2**				
		2.1	Analysis and interpretation of financial statements – meaning, importance and techniques	T2, R2	2	Chalk & Talk, PPT & Case Study
		2.2	Ratio analysis	T2, R2	5	
		2.3	Fund flow analysis	T2, R2	4	
		2.4	cash flow analysis (AS - 3)	T2, R2	3	
3	CO3: Apply the cost concepts for preparation of cost sheet and inventory valuation methods [K3]	**UNIT-3**				
		3.1	Cost accounting–meaning, importance, methods, techniques	T2, R2	2	Chalk & Talk,
		3.2	Classification of costs and cost sheet	T2, R2	3	
		MID I EXAMINATION				
		3.3	Inventory valuation methods- LIFO, FIFO, HIFO and weighted average method.	T1, R1	5	Tutorial

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4	CO4: Evaluate the use of budgetary control in the managerial decision making [K5]	UNIT-4				
		4.1	Management accounting – concept, need and importance	T2, R2	2	Chalk & Talk, PPT & Tutorial,
		4.2	Scope of Management accounting	T2, R2	1	
		4.3	Budgetary control-meaning, need, objectives, essentials of budgeting,	T2, R2	2	
		4.4	Different types of budgets and their preparation	T2, R2	5	
5	CO5: Differentiate Standard costing and Marginal costing K3]	UNIT- 5				
		5.1	Standard costing: Importance and limitations	T2, R2	2	Chalk & Talk, PPT, Tutorial, & Seminars
		5.2	Variance analysis (materials, labour)	T2	4	
		5.3	Marginal costing and its application in managerial decision making.	T2, R2	4	
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

T1 Vijaya Kumar.P, Ravindra P.S., Kiran Kumar V: "Accounting for Managers", Himalaya Publishing House, New Delhi.

T2 M.N. Arora, "Cost and Management Accounting", 10th edition, Vikas publishing house, New Delhi. 2012.

Reference Books:

R1 Maheshwari, Maheashwari and Maheshwari, "Financial Accounting", Vikas publishing House, New Delhi,2013

R2 Dr.Jawahar Lal: "Accounting for management", Himalaya Publishing house, NewDelhi, 2012.

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DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN A.Y. 2024-2025

Course Code	Course Title (Regulation)	Sem	Credits	Branch	Contact Periods/Week	Sections
R24MBA104	QABD (R24)	I	4	MBA	5	1

COURSE OUTCOMES:

LTP: 5
C: 4

At the end of the course students will be able to:

CO1: Explain the importance and applications of various quantitative techniques and their role in problem- solving. (K2)

CO2: Analyze various measures of probability and their applicability in statistical contexts. (K4)

CO3: Evaluate decision-making processes using principles of decision theory and justify optimal decisions. (K5)

CO4: Apply different sampling distribution techniques to solve real-world problems. (K3)

CO5: Formulate and test hypotheses to draw valid conclusions and inferences in statistical analysis. (K5)

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
1	CO1:Explain the Importance and Applications of various Quantitative Techniques and their role in problem. [K2]	**UNIT –I: QUANTITATIVE TECNIQUES**				
		1.1	Introduction & Definition of Quantitative Techniques.	T1,T2, R1	10	Chalk & Talk, Tutorial, &Case study
		1.2	Classification of Quantitative Techniques.	T1,T2, R1		
		1.3	Quantitative Techniques & other disciplines.	T1,T2, R1		
		1.4	Applications & Limitations of Quantitative Techniques.	T1 T2, R1		
2	CO2:Analyze various Measures of probability and their applicability in Statistical contexts. [K4]	**UNIT –II: MEASURES OF CENTRAL TENDENCY& DISPERSION**				
		2.1	Measures of Central Tendency& Measures of dispersion.	T1,T2, R2	20	Chalk & Talk, Tutorial, & Case Study
		2.2	Correlation & Regression Analysis.	T1,T2,R2		
		2.3	Probability & Bayes Theorem.	T1, T2,R2		
		2.4	Definitions and Simple Problems on Binomial,Poisson,Normal &Exponential probability Distributions.	T1,T2,R2		
3	CO3:Evaluate decision making processes using principles of decision theory	**UNIT – III: INTRODUCTION OF DECISION THEORY**				
		3.1	Introduction & definition of Decision Theory.	T1, T3, R2	12	Chalk & Talk, Tutorial, semina r,case
		3.2	Criteria for decision making under certainity,under uncertainity,risk utility.	T1, T3, R2		

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MID I EXAMINATION DURING EIGHTH WEEK						
	and justify optimal decisions. [K5]	3.3	Decision Trees.	T1, T3, R2		study
		3.4	Graphic displays of the decision making process.	T1, T3, R2		
		3.5	Decision nmaking with an active Apponent.			
4	CO4 : Apply different sampling distribution techniques to solve real world problems. [K3]	UNIT – IV: CONCEPT OF ESTIMATION AND SAMPLING				
		4.1	: Introduction of estimation & Its types.	T1, T2, R2	10	Chalk &Talk, Tutorial & case study
		4.2	Test for averages & proportions of small & large samples.	T1, T2, R2		
		4.3	Introduction of sampling its techniques and errors.	T1, T2, R2		
		4.4	Test of significance,types& concept of hypothesis.	T1,T2,R2		
		4.5	Test for means,proportions, variance & paired observations.	T1,T2,R2		
5	CO5: Formulate and test hypothesis to draw valid conclusions and inferences in statistical analysis. [K5]	UNIT – V:ANALYSIS OF VARIANCE				
		5.1	Introduction of analysis of variance.	T1,T2, R1	08	Chalk & Talk, Tutorial , Seminars& case study
		5.2	Classifications of analysis of variance .	T1,T2, R1		
		5.3	Non parametric tests.	T1,T2, R2		
		5.4	Chi-square distribution & its applications.	T1,T2,R2		
				Total	60	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1 N.D. Vohra, "Quantitative techniques in management", Tata McGraw Hill private Limited, New Delhi, 2011.

T2 Sancheti, Dc and VK Kapoor, "Business Mathematics", S. Chand and Sons, New Delhi.

T3 Anand Sharma, "Quantitative Techniques for Decision Making", Himalaya Publishers, New Delhi, 2012.

Reference Books:

R1 J. K. Sharma, "***Operations Research: Theory and Applications***", Macmillan Gupta S.P: "***Statistical Methods***", S. Chand and Sons, New Delhi,

R2 Anand Sharma: "**Quantitative Techniques for Business Decision Making**", Himalaya Publishers, New Delhi,2012;

R3 D P Apte: "***Operation Research and Quantitative Techniques***", Excel Publication, New Delhi, 2013

R4 Hamdy, A.Taha: "***Operations Research: An Introduction***", Prentice-Hall of India, New Delhi 2003.

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DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R24MBA105	ED (R24)	I	MBA	4	A

Academic Year : **2024 – 2025**
Branch : **Master of Business Administration** Year: **I**
Semester : **I** Section :**A**
Name of the Subject : **Entrepreneurship Development**
Name of the Faculty : **Dr. M. Aravind**

COURSE OUTCOMES:

CO1: students should have a foundational understanding of entrepreneurship, its driving forces, challenges, and the value it brings to economies, especially those in the developing world.(K1)
CO2: students should be equipped to navigate and leverage institutional support, recognize and manage startup challenges, and understand the crucial role of government and financial institutions in fostering entrepreneurial growth.(K2)
CO3: students should be able to differentiate types of entrepreneurs, evaluate the role of professionalism in entrepreneurship, understand the factors contributing to industry sickness, and identify key mechanisms and institutions involved in the revival of distressed businesses.(K1)
CO4: students should be equipped to define and classify projects, understand their life cycles, evaluate feasibility, and effectively document project planning and analysis through structured reports.(K2)
CO5: students should be able to understand the process of developing an enterprise, make informed startup decisions, assess market potential, and prepare a project report that supports a strategic approach to enterprise establishment.(K2)

Unit No	Outcome	Topics/Activity		Ref Text book	TotalPeriods	Delivery Method
1	CO1: students should have a foundational understanding of entrepreneurship, its driving forces, challenges, and the value it brings to economies, especially those in the developing world.(K1)	**UNIT -I : Introduction**			12	Chalk & Talk, PPT, & Tutorial
		1.1	Definition of Entrepreneur	T1, T2, R1		
		1.2	Entrepreneurial motivation	T1, T2, R1		
		1.3	Entrepreneurial barriers	T1, T2, R1		
		1.4	Internal factors Economic Barriers to Entrepreneurship	T1, T2, R1		
		1.5	External factors and Economic Barriers to Entrepreneurship	T1, T2, R1		
		1.6	Non-Economic Barriers to Entrepreneurship	T1, T2, R2		
		1.7	Theories of entrepreneurship; Classification of Entrepreneurship	T1, T2, R1		
		1.8	Entrepreneurship in Developing Economy	T1, T2, R2		
		1.9	Entrepreneurial Values and Attitudes	T1, T2, R1,R2		
2	CO2: students should be equipped to navigate and leverage institutional support, recognize and manage startup challenges, and understand the crucial role of government and financial institutions in fostering entrepreneurial growth.(K2)	**UNIT- II: Problems & Suppor**			11	Chalk & Talk, PPT & Case Study
		2.1	Incubation and Take-off	T1, T2, R1		
		2.2	Problems encountered Structural, Financial and Managerial Problems	T1, T2, R1		
		2.3	Types of Uncertainty	T1, T2, R2		
		2.4	Institutional support for new ventures:	T1, T2, R2		
		2.5	Supporting organizations; Incentives and facilities; Financial Institutions and Small-scale Industries.	T1, T2, R1		
		2.6	Govt. Policies for SSIs.	T1, T2, R1		
		2.7	Role of SIDBI in Project Management.	T1, T2, R1		
3		**UNIT -III : Types of Entrepreneurs**			13	Chalk & Talk, PPT,
		3.1	Family and non-family entrepreneurs	T1, T2, R1		
		3.2	Role of Professionals	T1, T2, R1		
		3.3	Professionalism vs. family entrepreneurs	T1, T2, R1		

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	CO3: students should be able to differentiate types of entrepreneurs, evaluate the role of professionalism in entrepreneurship, understand the factors contributing to industry sickness, and identify key mechanisms and institutions involved in the revival of distressed businesses.(K1)	3.4	Sick industries	T1, T2, R1		Tutorial
		3.5	Reasons for Sicknes	T1, T2, R1		
		3.6	Remedies for Sickness	T1, T2, R2		
		3.7	Role of BIFR in revival	T1, T2, R1		
		3.8	Bank Syndications	T1, T2, R2		
MID I EXAMINATION DURING EIGHTH WEEK						
4	CO4: students should be equipped to define and classify projects, understand their life cycles, evaluate feasibility, and effectively document project planning and analysis through structured reports.(K2)	**Unit -IV : Project Analysis**				
		4.1	Meaning and Definition of Project, Types & Characteristics.	T1, T2, R2	10	Chalk & Talk, PPT & Tutorial,
		4.2	ProjectPhases	T1, T2, R2		
		4.3	Project Life Cycle	T1, T2, R1		
		4.4	Project Family Tree	T1, T2, R1		
		4.5	Feasibility Analysis and Project Report.	T1, T2, R1		
5	CO5: students should be able to understand the process of developing an enterprise, make informed startup decisions, assess market potential, and prepare a project report that supports a strategic approach to enterprise establishment.(K2)	**Unit -V : Development of Enterpris**				
		5.1	Concept and development of Enterprise	T1, T2, R1	10	Chalk & Talk, PPT, Tutorial, & Seminars
		5.2	Procedure of starting Enterprise – Vital Decision to make during start up	T1, T2, R1		
		5.3	Project Report Preparation	T1, T2, R2		
		5.4	Choice of Enterprise, and Market Assessment of Enterprise.	T1, T2, R2		
				Total	56	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

REFERENCE BOOKS:

1) Couger, C-Creativity and Innovation (IPP, 1999)
2) Nina Jacob, -Creativity in Organisations (Wheeler, 1998)

TEXT BOOKS:

1) Tushman, M.L. & Lawrence, P.R. (1997)-Managing Strategic Innovation & ChangeOxford.
2) Jones T. (2003)-Innovating at the Edge: How Organizations Evolve and EmbedInnovation Capability.Butterwork Heinemann, U. K.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN A.Y.2024-25

Course Code	Course Title (Regulation)	Sem	Branch	L	T	P	Cr
R24MBA106	Business Environment (R24)	I	MBA	4	0	0	4

COURSE OUTCOMES: The student is able to

CO1: Outline the basic concepts of business environment and its components. [K2]
CO2: Assess the impact of concepts relating to Socio-cultural environment. [K6]
CO3: Evaluate different trade(economic) related policies and five-year plans in India [K5]
CO4: Assess the impact of concepts relating to political and legal environment. [K6]
CO5: Measure the impact of technological environment and environmental pollutions. [K5]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Outline the basic concepts of business environment and its components. [K2]		**UNIT-1: INTRODUCTION**			
		1.1	Definition, The Concept of Business Environment	T1, T3	15	Chalk & Talk, PPT, Case Study
		1.2	Business Environment Nature and Significance	T1, T3		
		1.3	Components of Business Environment	T1, T3		
		1.4	Impact of environment on business and strategic decisions	T1, T3,T5		
2	CO2: Assess the impact of concepts relating to Socio-cultural environment. [K6]		**UNIT-2: Social and Cultural Environment**			
		2.1	Introduction to the concept	T1, T3	14	Chalk &Talk, PPT, Case Study
		2.2	Social environment	T1, T3		
		2.3	Cultural environment	T1, T3		
		2.4	Impact of foreign culture on business	T1, T3		
		2.5	Types of social organizations	T1, T3		
		2.6	Social responsibilities of business	T1, T3,T5		
3	CO3: Evaluate different trade(economic) related policies and five-year plans in India [K5]		**UNIT-3: Economic Environment**			
		3.1	Introduction to Economic environment of business	T2, T3	14	Chalk &Talk, PPT, Case Study
		3.2	Economic systems	T2, T3		
		3.3	Macroeconomic parameters and their impact on business	T2, T3		
		3.4	Economic policies	T2, T3,T5		
		3.5	Five-year plans in India	T2, T3		
	MID I EXAMINATION DURING EIGHTH WEEK					

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4	CO4: Assess the impact of concepts relating to political and legal environment. [K6]	UNIT-4: Political and Legal Environment				
		4.1	Introduction to political environment	T14 T3	12	Chalk &Talk, PPT, Case Study
		4.2	Relationship between Government and business in India	T4, T3		
		4.3	Role of Government in business	T4, T3		
		4.4	Constitutional provisions regarding regulation of business in India	T4, T3		
		4.5	Legal environment	T4, T3		
		4.6	Implementation of business	T4, T3,T5		
			Corporate Governance	T4, T3		
5	CO5: Measure the impact of technological environment and environmental pollutions. [K5]	UNIT-5: Technological and Natural Environment				
		5.1	Features of Technological Environment	T1, T3	09	Chalk &Talk, PPT, Case Study
		5.2	Factors and Impact of technological environment	T1, T3		
		5.3	Technological Environment in India	T1, T3		
		5.4	Elements of Natural environment	T1, T3		
		5.5	Environmental Polutions	T1, T3,T5		
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:-

References:

1. Shaikh Saleem: "Business Environment", Pearsons, New Delhi,
2. Veena Keshav Pailwar: "Economic Environment of Business", PHI Learning, New Delhi, 2012
3. Rosy Joshi, Sangam Kapoor: "Business Environment", Kalyani Publishers, New Delhi, 2011.
4. Aswathappa K: "Essentials of Business Environment", Himalaya Publishing House, New Delhi, 2011.
5. Vivek Mittal: "Business Environment Text and Cases", Excel Books New Delhi, 2011.

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DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN A.Y.2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Credits	Contact Periods/Week	Sections
R24MBA109	IPR&P (R24)	I	MBA	3	5	1

COURSE OUTCOMES: The student is able to

CO1: Identify different types of Intellectual Properties (IPs), the right of ownership, scope of protection as well as the ways to create and to extract value from IP. (K3)
CO2: To improve the students for getting awareness of acquiring the patent. (K6)
CO3: To analyze the registration of copyright for their innovative works. (K4)
CO4: Analyze rights and responsibilities of holder of Patent, Copyright, Trademark, Industrial Design etc. (K4)
CO5: To know the importance of plagiarism in their innovations which can be questioned legally. (K5).

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	Identify different types of Intellectual Properties (IPs), the right of ownership, scope of protection as well as the ways to create and to extract value from IP. (K3)		**UNIT-1 INTRODUCTION TO IPR**			
		1.1	Meaning of property, Origin, Nature	T1, T3	10	Chalk & Talk, PPT, Case Study
		1.2	Meaning of Intellectual Property Rights –Kinds	T1, T3		
		1.3	Copy Right, Patent, Trademark,	T1, T3		
		1.4	Trade Secret and trade dress, Design,	T1, T3		
		1.5	Layout Design, Geographical Indication	T1, T3		
		1.6	Plant Varieties and Traditional Knowledge.	T1, T3		
2	**To** improve the students for getting awareness of acquiring the patent. (K6)		UNIT-2 PATENT RIGHTS AND COPY RIGHTS			
		2.1	Origin, Meaning of Patent, Types,	T1, T3	16	Chalk &Talk, PPT, Case Study
		2.2	Inventions which are not patentable,	T1, T3		
		2.3	Registration procedure, Rights and Duties of Patentee, Assignment and license,	T1, T3		
		2.4	Restoration of lapsed Patents, Surrender and Revocation of Patents,	T1, T3		
		2.5	Infringement, Remedies & Penalties	T1, T3		
		2.6	COPY RIGHT Origin, Definition &Types of Copy right	T1, T3		
		2.7	Registration procedure,	T1, T3		
		2.8	Assignment and license, Terms of Copy Right, Piracy,	T1, T3		

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		2.9	Infringement, Remedies, Copy rights with special reference to software.	T1, T3		
3	To analyze the registration of copyright for their innovative works. (K4)	UNIT-3. TRADEMARKS				
		3.1	TRADEMARKS— Origin, Meaning	T1, T3	07	Chalk &Talk, PPT, Case Study
		3.2	Nature of Trademarks	T1, T3		
		3.3	Types, Registration of Trade marks	T1, T3		
		3.4	Infringement & Remedies,	T1, T3		
		3.5	Offences relating to trade marks	T1, T3		
		3.6	Passing Off, Penalties	T1, T3		
MID I EXAMINATION DURING EIGHTH WEEK						
4	Analyze rights and responsibilities of holder of Patent, Copyright, Trademark, Industrial Design etc. (K4)	UNIT-4. DESIGN				
		4.1	DESIGN- Meaning, Definition, Object	T1, T3	07	Chalk &Talk, PPT, Case Study
		4.2	Registration of Design, Cancellation of Registration	T1, T3		
		4.3	International convention on design	T1, T3		
		4.4	functions of Design	T1, T3		
		4.5	Semiconductor Integrated circuits	T1, T3		
		4.6	layout design Act-2000	T1, T3		
5	To know the importance of plagiarism in their innovations which can be questioned legally. (K5).	UNIT-5. BASIC TENENTS OF INFORMATION TECHNOLOGY ACT - 2000				
		5.1	IT Act Introduction	T1, T3	05	Chalk &Talk, PPT, Case Study
		5.2	E-Commerce and legal provisions	T1, T3		
		5.3	E- Governance and legal provisions	T1, T3		
		5.4	Digital signature and Electronic Signature	T1, T3		
		5.5	Cybercrimes	T1, T3		
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:-

1. Intellectual Property Rights and the Law, Gogia Law Agency, by Dr. G.B. Reddy
2. Law relating to Intellectual Property, Universal Law Publishing Co, by Dr.B.L.Wadehra
3. IPR by P. Narayanan
4. Law of Intellectual Property, Asian Law House, Dr.S.R. Myneni

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3	**CO3:** Apply various techniques of capital budgeting for investment analysis. [K3]	**UNIT –III: INVESTMENT DECISION**				Chalk & Talk, PPT, Tutorial
		3.1	Concept and Techniques of Time Value of Money	T2, R1	5	
		3.2	Nature and Significance of Investment Decision	T1, T2, R1	1	
		3.3	Estimation of Cash flows	T1, T2, R1	2	
		3.4	Capital Budgeting Process	T1, T2, R1	2	
		MID I EXAMINATION DURING NINETH WEEK				
		3.5	Techniques of Investment Appraisal – Discounting and Non Discounting Methods.	T1, T2, R1	5	
4	**CO4:** Appraise the valuation methods of dividends and the dividend policies of Indian corporates. [K5]	**UNIT –IV: DIVIDEND DECISION**				Chalk & Talk, PPT & Tutorial,
		4.1	Meaning and Significance – Major forms of dividends	T1, T3	1	
		4.2	Theories of Dividends	T1, T2	4	
		4.3	Determinants of Dividend	T1, T3	1	
		4.4	Dividends Policy and Dividend valuation – Bonus Shares –Stock Splits	T1, T2,R2	3	
		4.5	Dividend policies of Indian Corporate.	T1, T2,R2	2	
5	**CO5:** Assess the working capital requirement of a firm and comprehend the nitty-gritty of current assets management. [K5]	**UNIT-V: LIQUIDITY DECISION**				Chalk & Talk, PPT, Tutorial, & Seminars
		5.1	Meaning - Classification and Significance of Working Capital	T1, T2, R3	2	
		5.2	Components of Working Capital – Factors determining the Working Capital	T1, T2, R3	2	
		5.3	Estimating Working Capital requirement	T1, T2, R3	2	
		5.4	Cash Management Models– Accounts Receivables –Credit Policies	T1	4	
		5.5	Inventory Management	T1	3	
				Total	61	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS	
T	BOOK TITLE/AUTHORS/PUBLISHER
T1	P.Vijaya Kumar, P.S.Ravindra, V. Kirankumar "**FinancialManagement**", Himalaya Publishing House, New Delhi,2013.
T2	G. Sudarshan Reddy, "**Financial Management**", Himalaya Publishing House, New Delhi,2012.
T3	D. Chandra Bose, "**Fundamentals of Financial Management**", PHI Publications, New Delhi,2012.
REFERENCE BOOKS	
R	BOOK TITLE/AUTHORS/PUBLISHER
R1	Prasanna Chandra: "**Financial Management Theory and Practice**", Tata McGrawHill 2011.
R2	I.M. Pandey: "**Financial Management**",Vikas Publishers, New Delhi, 2013.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet-522601 **Department of MBA**

LESSON PLAN-A.Y: 2024-25

PROGRAMME: MBA	
COURSE: **HUMAN RESOURCE MANAGEMENT**	Semester : **II** CREDITS: **4**
COURSE CODE: **R24MBA202** REGULATION: **R24**	COURSE TYPE (CORE /ELECTIVE / BREADTH/ S&H): **BREADTH**
COURSE AREA/DOMAIN: **MANAGEMENT**	PERIODS: 5 Per Week.

COURSE OUTCOMES: The student is able to

CO1: Cite evolution and emerging trends of HRM. [K1]
CO2: Critically analyze Investment and HRD concepts. [K4]
CO3: List different appraisal and Compensation system.[K2]
CO4: Evaluate incentive payment system and welfare measures given to employees.[K5]
CO5: Interpret industrial relations in organization.[K2]

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
1	CO1: Cite evolution and emerging trends of HRM. [K1]	**UNIT-I Introduction to HRM**				
		1.1	Definition, Concept, Nature and scope of HRM – Functions of HRM	T1, T2, R1	15	Chalk & Talk
		1.2	Evolution of HRM – Principles-Ethical aspects of HRM	T1, T21 R1		
		1.3	HR policies, Strategies to increase firm performance	T1, T2, R1		
		1.4	Role and position of HR department	T1, T2, R2		
		1.5	Strategic HR in changing environment – Emerging trends in HRM	T1, T2, R1		
2	CO2: Critically analyze Investment and HRD concepts. [K4]	**UNIT-II Investment perspectives of HRM**				
		2.1	HR Planning – Demand and Supply forecasting	T1, T2, R2	14	Chalk & Talk & Case Study
		2.2	Job Analysis-Job Design-Job Evaluation. Recruitment and Selection- Sources of recruitment – e-recruitment	T1, T2, R1		
		2.3	Sources of recruitment – e-recruitment -Steps in Selection Procedures	T1, T2, R2		

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		2.4	Tests and Interview Techniques – Induction	T1, T2, R2		
MID I EXAMINATION DURING EIGHTH WEEK						
		2.5	Training and Development – Need and Importance-Methods and of Training.	T1, T2, R2		
		2.6	Concept of HRD	T1, T2, R2		
3	CO3: List different appraisal and Compensation system.[K2]	**UNIT-III Performance Appraisal**				
		3.1	Importance – Methods – Traditional and Modern methods – Latest trends in performance appraisal	T1, T2, R2	14	Chalk & Talk , Ca study & Semina rs
		3.2	Career Development and Counselling	T1, T2, R1		
		3.3	Compensation - Concepts and Principles	T1, T2, R1		
		3.4	Influencing Factors- Current Trends in Compensation	T1, T2, R2		
		3.5	Methods of Payments in detail	T1, T2, R1		
		3.6	Incentives rewards compensation mechanisms	T1, T2, R1		
4	CO4: Evaluate incentive payment system and welfare measures given to employees.[K5]	**UNIT-IV Wage and Salary Administration**				
		4.1	Concept- Wage Structure- Wage and Salary Policies- Legal Frame Work	T1, T2, R2	11	Chalk & Talk , Case study & Semina rs
		4.2	Determinants of Payment of Wages- Wage Differentials- Incentive Payment Systems.	T1, T2, R2		
		4.3	Welfare management: Nature and concepts – statutory and non-statutory welfare measures.	T1, T2, R2		
5	CO5: Interpret industrial relations in organization.[K2]	**UNIT-V Managing Industrial Relations**				
		5.1	Industrial Relations-Nature-Importance -Trade Unions	T1, T2, R2	12	Chalk & Talk , Case study & Semina rs
		5.2	Employee Participation Schemes-Collective Bargaining	T1, T2, R1		
		5.3	Grievances and disputes resolution mechanisms – Managing employee safety and health.	T1, T2, R2		
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

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Text Books:

1. K Aswathappa: "Human Resource and Personnel Management", Tata McGraw Hill, New Delhi, 2013.
2. Subba Rao P: "Personnel and Human Resource Management-Text and Cases", Himalaya Publications, Mumbai, 2013.

Reference Books:

1. N. Sambasiva Rao and Dr. Nirmal Kumar: "Human Resource Management and Industrial Relations", Himalaya Publishing House, Mumbai.
2. Mathis, Jackson, Tripathy: "Human Resource Management: A south-Asin Perspective", Cengage Learning, New Delhi, 2013
3. Madhurima Lall, Sakina Qasim Zasidi: "Human Resource Management", Excel Books, New Delhi,2010

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet-522601 **Department of MBA**

LESSON PLAN-A.Y: 2024-25

PROGRAMME: MBA	
COURSE: **OPERATIONS MANAGEMENT**	Semester : **II** CREDITS: **4**
COURSE CODE: **R24MBA203** REGULATION: **R24**	COURSE TYPE (CORE /ELECTIVE / BREADTH/ S&H): **BREADTH**
COURSE AREA/DOMAIN: **MANAGEMENT**	PERIODS: 5 Per Week.

COURSE OUTCOMES: The student is able to

CO1: Apply the basic concepts of production and operations management and identify types of manufacturing processes. [K3]
CO2: Analyzing the effectiveness of plant location and plant layout. [K3]
CO3: Design strategies to improve productivity. [K6]
CO4: Evaluate purchasing function and inventory management function. [K5]
CO5: Develop the quality control system and quality control strategies. [K6]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
		UNIT-I Introduction to Management				
1	CO1: Apply the basic concepts of production & operations management and identify types of manufacturing processes. [K3].	1.1	Nature & Scope of Operation/ Production Management, Relationship with other functional areas	T1, T2, R1	17	Chalk & Talk, PPT, Active Learning & Tutorial
		1.2	Recent trend in Operation Management,	T1, T21 R1		
		1.3	Manufacturing & Theory of Constraint	T1, T2, R1		
		1.4	Types of Production System	T1, T2, R2		
		1.5	Just in Time (JIT) & lean system.	T1, T2, R1		
		UNIT-II Product Design & Process Selection				
2	CO2: Analysing the effectiveness of plant location and plant layout. [K3]	2.1	Value Analysis	T1, T2, R2	16	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		2.2	Facility location	T1, T2, R1		
		2.3	Layout and its Types	T1, T2, R2		

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		2.4	Characteristics, Advantages and Disadvantages	T1, T2, R2		
MID I EXAMINATION DURING EIGHTH WEEK						
		2.5	Work measurement, Job design	T1, T2, R2		
		2.6	Job design	T1, T2, R2		
3	CO3: Design strategies to improve productivity. [K6]	**UNIT-III Forecasting & Capacity Planning**				
		3.1	Methods of Forecasting,	T1, T2, R2	14	Chalk & Talk, PPT, Tutorial
		3.2	Overview of Operation Planning	T1, T2, R1		
		3.3	Aggregate Production Planning	T1, T2, R1		
		3.4	Production strategies, Capacity Requirement Planning	T1, T2, R2		
		3.5	MRP, Scheduling, Supply Chain Management,	T1, T2, R1		
		3.6	Purchase Management, Inventory Management	T1, T2, R1		
4	CO4: Evaluate purchasing function and inventory management function. [K5]	**UNIT-IV Productivity**				
		4.1	Factors, Affecting Productivity, Job design	T1, T2, R2	10	Chalk & Talk, PPT & Tutorial,
		4.2	Process Flow Charts, Methods Study	T1, T2, R2		
		4.3	Work Measurement, Engineering and Behavioural Approaches.	T1, T2, R2		
5	CO5: Develop the quality control system and quality control strategies. [K6]	**UNIT-V Quality Management**				
		5.1	Quality Definition, Dimension, Cost of Quality, Quality Circles, Continuous improvement (Kaizen), ISO (9000&14000 Series)	T1, T2, R2	11	Chalk & Talk, PPT, Tutorial, & Seminars
		5.2	Statistical Quality Control: Variable & Attribute, Process Control, Control Charts)	T1, T2, R1		
		5.3	Acceptance Sampling Operating Characteristic Curve (AQL ,LTPD, Alpha & Beta risk), Total Quality Management (TQM)	T1, T2, R2		
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:

1.K Aswathappa & Sridhar Bhatt, Production & Operations Management, Himalaya, Mumbai.

2. Panner Selvem, Production and Operation Management, Prentice Hall of India

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Reference Books:

1. Krajewski & Ritzman (2004). Operation Management -Strategy and Analysis. Prentice Hall of India.
2. Chunnawals, Production & Operation Management Himalaya, Mumbai
3. Charry, S.N (2005). Production and Operation Management- Concepts, Methods Strategy. John Willy &Sons Asia Pvt Limited.

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DEPARTMENT OF MASTER OF BUSINESS ADMINISTRATION
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R24MBA204	Marketing Management (R24)	II	MBA	5	2

COURSE OUTCOMES: The student is able to

CO1: Outline the concepts of marketing and its information system. [K2]
CO2: Analyse the segmentation, targeting and positioning in marketing. [K4]
CO3: Analyse various phases of product life cycle. [K4]
CO4: Evaluate marketing communication strategies. [K5]
CO5: Formulate the controlling techniques of marketing. [K6]

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
1	CO1: Outline the concepts of marketing and its information system. [K2]	**UNIT-1. INTRODUCTION TO MARKETING**			12	Chalk & Talk, PPT, Active Learning & Tutorial
		1.1	Needs - Wants – Demands - Products - Exchange - Transactions	T1, T2, R1		
		1.2	Concept of Market and Marketing and Marketing Mix	T1, T2, R1		
		1.3	Production Concept- Product Concept - Sales and Marketing Concept - Societal Marketing Concept	T1, T2, R1		
		1.4	Green Marketing concept	T1, T2, R1		
		1.5	Indian Marketing Environment.	T1, T2, R1		
2	CO2: Analyze the segmentation, targeting and positioning in marketing. [K4]	**UNIT-2 MARKET SEGMENTATION, TARGETING AND POSITIONING**			13	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		2.1	Identification of Market Segments - Consumer and Institutional/corporate Clientele	T1, T2, R2		
		2.2	Segmenting Consumer Markets - Segmentation Basis	T1, T2, R1		
		2.3	Evaluation and Selection of Target Markets	T1, T2, R2		
		2.4	Positioning significance	T1, T2, R2		
		2.5	Developing and Communicating a Positioning Strategy.	T1, T2, R2		
3	CO3: Analyze various phases of product life cycle. [K4]	**UNIT-3. PRODUCT AND PRICING ASPECTS**			11	Chalk & Talk, PPT, Tutorial
		3.1	Product – Product Mix - Product Life cycle Obsolescence	T1, T2, R1		
		3.2	Pricing Objectives of Pricing - Methods of Pricing	T1, T2, R1		
		MID I EXAMINATION DURING EIGHTH WEEK				
		3.3	Selecting the Final price - Adopting price - Initiating the price cuts	T1, T2, R1		
		3.4	Imitating price Increases- Responding to Competitor's price changes.	T1, T2, R1		

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4	CO4:Evaluate marketing communication strategies. [K5]	UNIT-4. MARKETING COMMUNICATION				
		4.1	Communication Process – Communication Mix	T1, T2, R2	12	Chalk & Talk, PPT & Tutorial,
		4.2	Integrated Marketing Communication - Managing Advertising Sales Promotion	T1, T2, R2		
		4.3	Public relations and Direct Marketing - Sales force	T1, T2, R1		
		4.4	Determining the Sales Force Size - Sales force Compensation.	T1, T2, R1		
5	CO5: Formulate the controlling techniques of marketing. [K6]	UNIT 5 DISTRIBUTION, MARKETING ORGANIZATION AND CONTROL				
		5.1	Channels of Distribution-Intensive	T1, T2, R2	12	Chalk & Talk, PPT, Tutorial, & Seminars
		5.2	Selective and Exclusive Distribution- Organizing the Marketing Department	T1, T2, R1		
		5.3	Marketing Implementation - Control of Marketing Performance	T1, T2, R1		
		5.4	Annual Plan Control - Profitability Control	T1, T2, R1		
		5.5	Efficiency Control - Strategic Control.	T1, T2, R1		
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1 RajanSexena: "Marketing Management", Tata McGraw Hill, New Delhi, 2012.

T2 Sontakki C.N.: "Marketing Management". Kalyani Publishers, New Delhi, 2012.

Reference Books:

R1 Phillip Kotler: "Marketing Management ", Pearson Publishers, New Delhi, 2013.

R2 V S Ramaswamy & S Namakumari, Marketing Management Global Perspective Indian Conte: 4th Edition, Mac Millan Publishers 2009.

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DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN-A.Y-2024-2025

PROGRAMME: MBA	
COURSE: **RESEARCH METHODS FOR BUSINESS DECISIONS(R24)**	Semester: **II** CREDITS: **4**
COURSE CODE: **R24MBA205** REGULATION: **R24**	COURSE TYPE (CORE /ELECTIVE / BREADTH/ S&H): **CORE**
COURSE AREA/DOMAIN: **MANAGEMENT**	PERIODS: 5 Per Week.

COURSE OUTCOMES: The student is able to

CO 1: Understand advanced design, methodologies and analysis in business research methods, including key terms, classifications and systematic applications to the research data and design of a research project (K2)

CO 2: Apply knowledge in collecting data from various sources. (K3)

CO 3: Demonstrate knowledge in data analysis and interpretation. (K2)

CO 4: Applying appropriate statistical techniques in the analysis of data(K3)

CO 5: Demonstrate the abilities in preparing research reports. (K2)

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1: Understand advanced design, methodologies and analysis in business research methods, including key terms, classifications and systematic applications to the research data and design of a research project (K2)		**UNIT-1. INTRODUCTION TO RESEARCH**			
		1.1	Introduction, Nature and Importance of Research, the role of Business Research, Aims of social research	T1, T2, R1	2	Chalk & Talk, PPT,
		1.2	Types of research- Pure research vs. Applied research, Qualitative research vs. Quantitative research, Exploratory research, Descriptive research and Experimental research,	T1, T2, R1	4	Chalk & Talk, PPT, & Tutorial
		1.3	Ethical issues in business research Defining research problem	T1, T2, R1	2	Chalk & Talk, PPT,
		1.4	Steps in Research process	T1,R1	2	Chalk & Talk
2	CO 2: Apply knowledge in collecting data from various sources[K3]		**UNIT-2. DATA BASE**			
		2.1	Discussion on primary data and secondary data, tools and techniques of collecting data. Methods of collecting data.	T1, T2, R1	4	Chalk & Talk Case Study
		2.2	Sampling design and sampling procedures Random vs. Non-random sampling techniques, determination of sample size and an appropriate sampling design.	T1, T2, R1	3	Chalk & Talk Seminar
		2.3	Designing of Questionnaire	T1, T2,R1	2	Chalk & Talk, PPT
		2.4	Measurement and Scaling: Nominal Scale – Ordinal Scale- Interval Scale – Ratio Scale – Guttmann Scale – Likert Scale – Schematic Differential Scale	T1, T2,R1	3	Chalk & Talk
3	CO 3: Demonstrate knowledge in data analysis and interpretation. (K2)		**UNIT-3. SURVEY RESEARCH AND DATA ANALYSIS**			
		3.1	Selection of an appropriate survey research design, the nature of field work and Field work management	T1, T2, R1	3	Chalk & Talk,
		3.2	Media used to communicate with Respondents, Personal Interviews, Telephone interviews, Self-administered	T1, T2, R1	3	Chalk &

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			Questionnaires			
		3.3	Editing – Coding – Classification of Data	T1, T2, R1	2	Chalk & Talk
		3.4	– Tables and Graphic Presentation– Preparation and Presentation of Research Report.	T1, T2, R1	2	Chalk & Talk
MID I EXAMINATION DURING EIGHTH WEEK						
4	CO 4: Applying appropriate statistical techniques in the analysis of data [K3]		UNIT-4. STATISTICAL INFERENCE			
		4.1	Formulation of Hypothesis -Tests of Hypothesis -Introduction to Null hypothesis vs. alternative hypothesis, , tests of significance for small samples,	T1, R2	2	Chalk & Talk
		4.2	parametric vs. non-parametric tests,	T1,T2,R3	2	PPT
		4.3	procedure for testing of hypothesis	T1, T2, R3	1	PPT & Tutorial
		4.4	tests of significance for small samples,	T1, T2, R3	1	Chalk & Talk
		4.5	application t-test	T1, T2, R3	4	Chalk & Talk
		4.6	Chi Square test	T1, T2, R3	4	Chalk & Talk
5	CO 5: Demonstrate the abilities in preparing research reports. (K2)		UNIT 5. MULTIVARIATE ANALYSIS			
		5.1	Nature of multivariate analysis, classifying multivariate techniques,	T1, T3, R3	2	Chalk & Talk, PPT
		5.2	analysis of dependence, analysis of interdependence	T1, T3,R3	2	Chalk & Talk
		5.3	Bi- Variate analysis-tests of differences	T1, T3, R3	4	Chalk & Talk
		5.4	t-test for comparing two means	T1,T3,R1	3	Chalk & Talk
		5.5	z-test for comparing two proportions	T1,T3,R1	3	Chalk & Talk
		5.6	ANOVA for complex experimental designs.	T1,T3,R1	4	Chalk & Talk
				Total	64	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1 Research methodology Methods & Techniques, C.R. Kothari; 2/e, New Age international, 2004.

T2 Business Research Methods, William G. Zikmund; Cengage publications, 2006.

T3 N.D.Vohra: *—Quantitative Techniques in Management*, Tata- McGraw Hill Private Limited, New Delhi, 2011.

Reference Books:

R1 Business Research Methodology, J.K. Sachdeva; Himalaya, 2009.

R2 Donald R Cooper and Pamela S Schindler, **Research Methods**, 9th edition, Tata McGraw

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DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Credits
R24MBA206	Business Analytics (R24)	II	MBA	5	4

S.No	Outcomes	Topic(s) to be Covered	Ref Text Book	Total-60 Periods	Teaching Aids
		UNIT – I: Introduction to Data analytics			
1	**CO1:** To understand business communication through data-driven information, (K2)	Introduction to Data analytics	T1, T2, R1	12	Chalk & Talk, Active Learning & Tutorial
2		Role of Data in Organization, Data lifecycle. (Data source, data changes, processes, usage)	T1, T2, R1		
3		Various Data Types	T1, T2, R1		
4		Significance of Analytics	T1, T2, R1		
5		Role of Data Analyst	T1, T2, R1		
6		Difference between Data analytics and Business	T1, T2, R1		
7		Real-world data analytics examples.	T1, T2, R1		
		UNIT – II: Tools & Techniques			
8	**CO2:** Apply knowledge and explain natural processes by relating them to a certain distribution of data. (K3)	Typical Data Analysis Process	T1, T2, R2	12	Chalk & Talk, Active Learning & Tutorial
9		Data analytics techniques: Regressionanalysis, Factor analysis, Cohort analysis, Cluster analysis	T1, T2, R2		
10		Time-series analysis. Data analytics tools	T1, T2, R1		
11		Microsoft Excel	T1, T2, R2		
12		Tableau	T1, T2, R2		
13		SAS	T1, T2, R2		
14		Rapid Miner	T1, T2, R2		
15		Power BI.	T1, T2, R1		
		UNIT – III: Concepts of data cleaning - Data Visualization			
16	**CO3:** To understand the data visualization tools, application and statistical	Over view of Data visualization.	T1, T2, R1	12	Chalk & Talk, Active Learning & Tutorial
17		Data Visualization tools, Statistical methods for summarizing data.	T1, T2, R1		
18		How to create pivotal tables using excel - Exploring data using pivot table.	T1, T2, R1		
19		Exploring data using pivot table.	T1, T2, R1		
		1st Mid Exams			
20		Cross Tabulation.	T1, T2, R1		

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21	methods . (K2)	Creating Charts: -1. Scatter charts, 2. Line charts, 3. Bar charts and column, 4. Pie Charts and 3-D charts, 4. Bubble charts.	T1, T2, R1		
22		Effective use of Dashboards, Power BI and Tableau.	T1, T2, R1		
UNIT – IV: Descriptive Analytics					
23	CO4: To learn the measure of variability in decision making (K4)	Concept of Descriptive Analytics	T1, T2, R2	12	Chalk & Talk, Active Learning & Tutorial
24		Measures of central Tendency	T1, T2, R2		
25		Measuring and calculation of Arithmetic Mean, Mode, Median	T1, T2, R1		
26		Calculation of application of Weighted Arithmetic Mean, Geometric and Harmonic mean using MS Excel	T1, T2, R1		
27		Measures of Variability	T1, T2, R2		
28		Range, Variance, Standard Deviation, Coefficient of Variation using MS Excel	T1, T2, R2		
UNIT – V: Predictive Analytics					
29	CO5: Evaluate and compare descriptive and predictive analytics with use case scenarios . (K5)	Karl Pearson Correlation Techniques	T1, T2, R1	12	Chalk & Talk, Active Learning & Tutorial
30		Spearman's Rank correlation	T1, T2, R1		
31		Simple and Multiple regression	T1, T2, R1		
32		Regression by the method of least squares	T1, T2, R2		
33		Building good regression models	T1, T2, R2		
34		Regression with categorical independent variables.	T1, T2, R2		
		2nd Mid Exams			
		End Exams			

Text Books:

1. Dave Evans., Susan Bratton, [2008]. Social Media Marketing: An Hour a Day. ,2nd edition, Wiley
2. Dave Evans., Susan Bratton, [2010]. Social Media Marketing: The Next Generation of Business Engagement. Wiley
3. Your Google Game Plan for Success: Increasing Your Web Presence with Google AdWords, Analytics and Website Optimizer, Joe Teixeira, Wiley 2010
4. Michael Miller, B2B Digital Marketing, 1e, Pearson, 2014.

Reference Books:

1. Vandana Ahuja, Digital marketing, Oxford University Press 2015.
2. Michael R Solomon, Tracy Tuten, Social Media Marketing, Pearson, 1e, 2015.
3. Judy Strauss & Raymond Frost, E-Marketing, Pearson, 2016.
4. Richard Gay, Alan Charles worth and Rita Esen, Online marketing – A customer led approach Oxford University Press 2007.
5. Arup Varma, Pawan S. Budhwar, Angelo S. De Nisi, Digital Marketing, Wiley, 2016.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601 Department of MBA

LESSON PLAN-A.Y: 2024-25

PROGRAMME: MBA	
COURSE: **PROJECT MANAGEMENT**	Semester: **II** CREDITS: **3**
COURSE CODE: **R24MBA208** REGULATION: **R24**	COURSE TYPE (CORE /ELECTIVE / BREADTH/ S&H): **CORE**
COURSE AREA/DOMAIN: MANAGEMENT	PERIODS: 5 Per Week.

COURSE OUTCOMES: The student is able to

CO1: Best practice for increase profit and cost advantage. [K3]
CO2: Enhance ability to planed implement and control the projects. [K3]
CO3: It's a technical toll for managing project completion. [K5]
CO4: To provide investment strategies the project proposals. [K5]
CO5: Strength and relevant behavioral and leadership capabilities. [K6]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Best practice for increase profit and cost advantage. [K3]		**UNIT-I-**		14	Chalk & Talk, Active Learning & Tutorial
		1.1	Basics of Project Management –Concept– Project environment	T1, R1		
		1.2	Types of Projects – Project life cycle – Project proposals – Monitoring project progress – Project appraisal and Project selection	T1, R1		
		1.3	Causes of delay in Project commissioning– Remedies to avoid overruns.	T1, T2, R1		
		1.4	Identification of Investment opportunities – Sources of new project ideas, preliminary screening of projects	T1, T2, R2		
		1.5	Components for project feasibility studies.	T1, T2, R1		
2	CO2: Enhance ability to planed implement and control the projects. [K3]		**UNIT-II-**		12	Chalk & Talk, Active Learning & Case Study
		2.1	Market feasibility -Market survey- Categories of Market survey	T1, T2, R2		
		2.2	Steps involved in conducting market survey	T1, T2, R1		
		2.3	Demand forecasting techniques, sales projections.,	T1, T2, R2		
		2.4	Business environment for project management.	T1, T2, R2		
	MID I EXAMINATION DURING EIGHTH WEEK					

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3	CO3: It's a technical toll for managing project completion. [K5]		UNIT-III -			
		3.1	Technical and Legal feasibility: Production technology, materials and inputs	T1, T2, R2	15	Chalk & Talk, PPT, Tutorial & Case Study
		3.2	Plant capacity, site selection, plant layout, Managerial Feasibility Project organization and responsibilities	T1, T2, R1		
		3.3	Legalities – Basic legal provisions.	T1, T2, R1		
		3.4	Development of Programme Evaluation & Review Technique (PERT) Construction of PERT (Project duration and valuation, slack and critical activities, critical path interpretation)	T1, T2, R2		
		3.5	Critical Path Method (CPM)	T1, R1		
4	CO4: To provide investment strategies the project proposals. [K5]		UNIT-IV-			
		4.1	Financial feasibility – Capital Expenditure – Criteria and Investment strategies	T1, T2, R2	12	Chalk & Talk, PPT & Tutorial & Case Study
		4.2	Capital Investment Appraisal Techniques (Non DCF and DCF) – Risk analysis – Cost and financial feasibility	T1, T2, R2		
		4.3	Cost of project and means of financing — Estimation of cash flows – Estimation of Capital costs and operating costs; Revenue estimation	T1, T2, R2		
		4.4	Income – Determinants – Forecasting income – Operational feasibility	T1,T2, R2		
		4.5	Breakeven point – Economics of working.	T1,T2, R2		
5	CO5: Strength and relevant behavioral and leadership capabilities[K6]		UNIT-V-			
		5.1	Project Implementation and Review: Forms of project organization	T1, T2, R2	11	Chalk & Talk, PPT, Tutorial, & Seminars
		5.2	project planning – project control – human aspects of project management	T1, T2, R1		
		5.3	Prerequisites for successful project implementation – project review – performance evaluation – abandonment analysis.	T1, T2, R2		
MID II EXAMINATION DURING EIGHTEENTH WEEK					64	
END EXAMINATIONS						

Text Books:

1.Prasanna Chandra, "Projects, Planning, Analysis, Selection, Financing, Implementation and Review", Tata McGraw Hill Company Pvt. Ltd., New Delhi 1998.

2. Vasanth Desai, Project Management, 4th edition, Himalaya Publications 2018.

References:

1. Gido: Effective Project Management, 2e, Thomson, 2007.

2. Singh M.K, "Project Evaluation and Management".

3. Clifford F. Gray, Erik W. Larson, "Project Management, the Managerial Emphasis", McGraw Hill, 2000.

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NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet-522601** **Department of MBA**

LESSON PLAN-A.Y: 2025-26

PROGRAMME: MBA	
COURSE: **RM**	Semester : **III** CREDITS: **4**
COURSE CODE: **24MBA3THM3** REGULATION: **R24**	COURSE TYPE (CORE /ELECTIVE / BREADTH/ S&H): **BREADTH**
COURSE AREA/DOMAIN: **MANAGEMENT**	PERIODS: **6** Per Week.

COURSE OUTCOMES: The student is able to
CO1: Outline fundamentals of Retailing. [K2]
CO2: Identify the general strategies of retailing. [K3]
CO3: Formulate location strategies of retailing. [K6]
CO4: Develop layout designs. [K6]
CO5: Analyse various pricing strategies and develop location strategies. [K4]
CO6: Formulate different types of franchising and its impact on the business. [K6]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Outline fundamentals of Retailing. [K2]		**UNIT-1** BASIC CONCEPT OF RETAILING			
		1.1	Retail development-types and functions of retailer	T1, T2, R1	07	Chalk & Talk, PPT, Active Learning & Tutorial
		1.2	Multi -channel retailing	T1, T2, R1		
		1.3	organized retailing in India	T1, T2, R1		
		1.4	special characteristics of retailing-	T1, T2, R1		
		1.5	services retailing	T1, T2, R1		
		1.6	legislation for retailing in India.			
2	CO2: Identify the general strategies of retailing. [K3]		**UNIT-2** RETAILING STRATEGY			
		2.1	Market strategy	T1, T2, R2	08	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		2.2	retail format and target market	T1, T2, R1		
		2.3	building sustainable competitive advantage growth strategies	T1, T2, R2		
		2.4	strategic retail planning process.	T1, T2, R2		

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3	CO3: Formulate location strategies of retailing. [K6]	**UNIT-3.** RETAIL LOCATION				
		3.1	Types, location opportunities	T1, T2, R1	08	Chalk & Talk, PPT, Tutorial
		3.2	selection of location	T1, T2, R1		
		3.3	site analysis	T1, T2, R1		
		3.4	financial strategy strategic profit model	T1, T2, R1		
		3.5	setting performance objectives	T1, T2, R1		
		3.6	measuring performance objectives	T1, T2, R1		
MID I EXAMINATION DURING EIGHTH WEEK						
4	CO4: Develop layout designs. [K6]	**UNIT-4.** STORE LAYOUT AND DESIGN				
		4.1	Store operations and inventory management	T1, T2, R2	07	Chalk & Talk, PPT & Tutorial,
		4.2	merchandise planning and control	T1, T2, R2		
		4.3	buying merchandise	T1, T2, R1		
		4.4	developing assortment plan	T1, T2, R1		
5	CO5: Analyse various pricing strategies and develop location strategies. [K4]	**UNIT-5.** STRATEGY IMPLEMENTATION				
		5.1	Category management, customer services,retail branding	T1, T2, R2	08	Chalk & Talk, PPT, Tutorial, & Seminars
		5.2	International retailing promotional strategies	T1, T2, R1		
		5.3	advertising, sales promotion, store atmosphere.	T1, T2, R1		
6	CO6: Formulate different types of franchising and its impact on the business. [K6]	**UNIT-6.** CONCEPT OF FRANCHISING				
		6.1	Evolution of franchising	T1, T2, R1	08	Chalk & Talk, PPT Tutorial, Active Learning & Seminars
		6.2	types-franchising in India	T1, T2, R1		
		6.3	Introduction to E- marketing meaning	T1, T2, R1		
		6.4	scope of E-marketing	T1, T2, R1		
				Total	54	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:

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. "Retail Management", Sheikh and Kaneez Fatima, Himalaya Publishing House, Mumbai, 2012
2. "The Art of Retailing", A.J. Lamba: Tata McGraw Hill Education Pvt. Ltd. New Delhi.2011 3. "Retail Marketing", Siva Kumar, A, Excel Books, New Delhi, 2007

Reference Books:

1. "Retail management", Swapna Pradhan, Tata McGraw Hill Education Pvt. Ltd. New Delhi, 2012
2. "Retail Management", Chetan Bajaj RajnishTuli, Nidhivarma Srivastava: Oxford University Press, New Delhi, 2012.

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DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
19MBA3TH02	BECG	III	MBA	5	1

COURSE OUTCOMES: The student is able to

CO1: Outline fundamentals of Values and ethics. [K2]
CO2: Evaluate the global issues with respect to business ethics. [K6]
CO3: Analyse manager's responsibilities in business ethics. [K4]
CO4: Apply Corporate Governance Theories into Practice. [K6]
CO5: Apply the Corporate Governance Scenario in India. [K6]
CO6: Elaborate of Media in Indian Corporate Governance. [K6]

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
1	CO1:Outline mentals of Values and . [K2]	UNIT-I: IMPORTANCE OF BUSINESS ETHICS				
		1.1	Importance of Business Ethics: Values and Ethics	T1, T2, R1	08	Chalk & Talk, PPT, Active Learning & Tutorial
		1.2	Business Ethics and Law – Ethics in Work Place	T1, T2, R1		
		1.3	Ethical Decision Making-	T1, T2, R1		
		1.4	Theories of Business Ethics	T1, T2, R1		
		1.5	Management and Ethics- Indian Ethical Traditions	T1, T2, R1		
2	CO2:Evaluate the global with respect to business . [K6]	UNIT-2 IMPACT OF GLOBALIZATION				
		2.1	Impact of Globalization on Indian business ethics.	T1, T2, R2	08	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		2.2	Reasons for Unethical Practices among Indian companies	T1, T2, R1		
		2.3	Development of Indian Capital Markets	T1, T2, R2		
		2.4	Various studies on Ethical Attitudes of Managers Major Indian Scams	T1, T2, R2		
3	CO3: Analyse manager's nsibilities in business . [K4]	UNIT-3. ETHICS IN MARKETING, HRM AND FINANCE				
		3.1	Ethics in Marketing, HRM and Finance	T1, T2, R1	10	Chalk & Talk, PPT, Tutorial
		3.2	Product safety and Pricing	T1, T2, R1		
		3.3	Ethical responsibility in Product	T1, T2, R1		
		3.4	Ethics in HRM & Finance	T1, T2, R1		
		3.5	Frauds in Banks	T1, T2, R1		
		3.6	Measures against Bank Frauds	T1, T2, R1		

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		MID I EXAMINATION DURING EIGHTH WEEK					
4	CO4:Apply Corporate rnance Theories into ce. [K6]	UNIT-4. CORPORATE GOVERNANCE					
		4.1	Corporate Governance: An overview – Theory and Practice of Governance-	T1, T2, R2	10	Chalk & Talk, PPT & Tutorial,	
		4.2	Good Corporate Governance – Land marks in emergence of Governance	T1, T2, R2			
		4.3	The Organization for Economic Co-operation and Development [OECB] Principles –	T1, T2, R1			
		4.4	Sarbanes Oxley Act 2002- SEBI Initiatives	T1, T2, R1			
5	CO5:Apply the rate Governance rio in India. [K6]	UNIT 5 CORPORATE GOVERNANCE INDIAN SCENARIO					
		5.1	Corporate Governance Indian Scenario: Role of Government in Ensuring Corporate Governance	T1, T2, R2	08	Chalk & Talk, PPT, Tutorial, & Seminars	
		5.2	Governance issues relating to Board of Directors	T1, T2, R1			
		5.3	Duties and responsibilities of Auditors	T1, T2, R1			
6	CO6:Elaborate of Media lian Corporate rnance. [K6]	UNIT6: GOVERNANCE UNDER LIMITED COMPETITION					
		6.1	Governance under limited competition	T1, T2, R1	10	Chalk & Talk, PPT Tutorial, Active Learning & Seminars	
		6.2	Role of Media	T1, T2, R1			
		6.3	Corporate Governance in Developing	T1, T2, R1			
		6.4	Transiting Economies	T1, T2, R1			
				Total	54		
		MID II EXAMINATION DURING EIGHTEENTH WEEK					
		END EXAMINATIONS					

Text Books:

T1. "Professional Ethics and Morals", Prof.A.R.Aryasri, Dharanikota Suyodhana: Maruthi Publication.2009

T2 Ethics in Business and Corporate Governance", S.K.Mandal: TMH, New Delhi, 2012.

Reference Books:

R1 "Business Ethics and Value Systems", H.C.Mruthyunjaya, PHI Learning, New Delhi, 2013.

R2 "Values and Ethics in Profession"Sisir Mazumder: Everest Publishing House, New Delhi, 2013.

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Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Credits
R19MBA206	Business Analytics (R19)	III	MBA	5	4

S.No	Outcomes	Topic(s) to be Covered	Ref Text Book	Total-60 Periods	Teaching Aids
		UNIT – I: Introduction to Data analytics			
1	**CO1:** To understand business communication through data-driven information, (K2)	Introduction to Data analytics	T1, T2, R1	12	Chalk & Talk, Active Learning & Tutorial
2		Role of Data in Organization, Data lifecycle. (Data source, data changes, processes, usage)	T1, T2, R1		
3		Various Data Types	T1, T2, R1		
4		Significance of Analytics	T1, T2, R1		
5		Role of Data Analyst	T1, T2, R1		
6		Difference between Data analytics and Business	T1, T2, R1		
7		Real-world data analytics examples.	T1, T2, R1		
		UNIT – II: Tools & Techniques			
8	**CO2:** Apply knowledge and explain natural processes by relating them to a certain distribution of data. (K3)	Typical Data Analysis Process	T1, T2, R2	12	Chalk & Talk, Active Learning & Tutorial
9		Data analytics techniques: Regressionanalysis, Factor analysis, Cohort analysis, Cluster analysis	T1, T2, R2		
10		Time-series analysis. Data analytics tools	T1, T2, R1		
11		Microsoft Excel	T1, T2, R2		
12		Tableau	T1, T2, R2		
13		SAS	T1, T2, R2		
14		Rapid Miner	T1, T2, R2		
15		Power BI.	T1, T2, R1		
		UNIT – III: Concepts of data cleaning - Data Visualization			
16	**CO3:** To understand the data visualization tools, application and statistical	Over view of Data visualization.	T1, T2, R1	12	Chalk & Talk, Active Learning & Tutorial
17		Data Visualization tools, Statistical methods for summarizing data.	T1, T2, R1		
18		How to create pivotal tables using excel	T1, T2, R1		
19		Exploring data using pivot table.	T1, T2, R1		
		1st Mid Exams			
20		Cross Tabulation.	T1, T2, R1		

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21	methods . (K2)	Creating Charts: -1. Scatter charts, 2. Line charts, 3. Bar charts and column, 4. Pie Charts and 3-D charts, 4. Bubble charts.	T1, T2, R1		
22		Effective use of Dashboards, Power BI and Tableau.	T1, T2, R1		
UNIT – IV: Descriptive Analytics					
23	CO4: To learn the measure of variability in decision making (K4)	Concept of Descriptive Analytics	T1, T2, R2	12	Chalk & Talk, Active Learning & Tutorial
24		Measures of central Tendency	T1, T2, R2		
25		Measuring and calculation of Arithmetic Mean, Mode, Median	T1, T2, R1		
26		Calculation of application of Weighted Arithmetic Mean, Geometric and Harmonic mean using MS Excel	T1, T2, R1		
27		Measures of Variability	T1, T2, R2		
28		Range, Variance, Standard Deviation, Coefficient of Variation using MS Excel	T1, T2, R2		
UNIT – V: Predictive Analytics					
29	CO5: Evaluate and compare descriptive and predictive analytics with use case scenarios . (K5)	Karl Pearson Correlation Techniques	T1, T2, R1	12	Chalk & Talk, Active Learning & Tutorial
30		Spearman's Rank correlation	T1, T2, R1		
31		Simple and Multiple regression	T1, T2, R1		
32		Regression by the method of least squares	T1, T2, R2		
33		Building good regression models	T1, T2, R2		
34		Regression with categorical independent variables.	T1, T2, R2		
		2nd Mid Exams			
		End Exams			

TEXT BOOKS	
T	**BOOK TITLE/AUTHORS/PUBLISHER**
T1	R for Data Science: Import, Tidy, Transform, Visualize, and Model Data,Hadley Wickham & Garrett Grolemund.O'REILLY.
T2	Mohiuddin Ahmed, Al-Sakib Khan Pathan, Data Analytics: Concepts, Techniques,and Applications, Taylor & Francis Group, 2020
REFERENCE BOOKS	
R	**BOOK TITLE/AUTHORS/PUBLISHER**
R1	James Evans, Business Analytics, 2e, Pearson, 2017.
R2	Akil Maheswari, Big Data, Upskill ahead by Tata McGraw Hill, New Delhi, 2016.

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DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN

Academic Year: 2024-25 (2023-25 Batch)					
Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
19MBA3THF1	Investment & Portfolio Management (R19)	III	MBA	6	A & B

COURSE OUTCOMES: The student is able to

CO1: Analyse various investment alternatives for effective investment decision [K4].
CO2: Discuss the importance of security analysis in investment decision process [K6].
CO3: Design bond management strategies to realise good return on bond investment [K6].
CO4: Apply different equity valuation methods for the valuation of securities [K3].
CO5: Construct optimal portfolio for higher return at lower risk [K6].
CO6: Analyse different schemes of mutual funds for better investment decision [K4].

Unit No	Outcome		Topics/Activity	Ref. Text book	Total Periods	Delivery Method
1	CO1: Analyse various investment alternatives for effective investment decision [K4].		**UNIT-1 INVESTMENTS**			
		1.1	Definition of investment, Investment Decision Process	T1, T2, R1	2	Chalk & Talk, PPT, Active Learning & Tutorial
		1.2	Sources of investment information; Real investment vs. financial investment, Investment vs. Speculation	T1, T2, R1	2	
		1.3	Factors to be considered in investment decision: Liquidity, Return, Risk, Maturity, Safety, Tax and Inflation	T1, T2, R1	1	
		1.4	The concept and measurement of realized return and expected return	T1, T2, R1	1	
		1.5	Ex-ante and ex-post returns. Measurement of risk-range.	T1, T2, R1	8	
		1.6	Risk-return trade-off. Risk premium and risk aversion.	T1, T2, R1	1	
2	CO2: Discuss the importance of security analysis in investment decision process [K6].		**UNIT-2 SECURITY ANALYSIS**			
		2.1	Definition and objectives of Securities Analysis – Types of Securities	T1, T2, R1	1	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		2.2	Analysis -Fundamental Analysis, Objectives and believes of Fundamental Analysis	T1, T2, R1	2	
		2.3	Industry Analysis: Key Characteristics – Industry Life Cycle	T1, T2, R2	2	
		2.4	Company Analysis	T1, T2, R2	1	
		2.5	Technical Analysis – Meaning – Types – Features of Technical Analysis - Dow Theory	T1, T2, R1	2	
		2.6	Efficient Market Hypothesis.	T1, T2, R1	1	
3	CO3: Design bond management strategies to		**UNIT-3. FIXED INCOME SECURITIES**			
		3.1	Bond basics, Features and types of	T2		Chalk &

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	Investment [K6].	3.2	factors affecting bond yield: coupon rate, maturity period,	T1, T2, R1	1	PPT, Tutorial
		3.3	Bond yield measurement-Current yield, holding period return, YTM, AYTM and YTC.	T1, T2, R1	5	
		3.4	Bond valuation: Capitalization of income method, Bond-price theorems,	T1, T2, R1	2	
		3.5	Bond duration, Macaulay's duration and modified Macaulay's duration.	T1, T2, R1	2	
		3.6	Bond immunization, active and passive bond portfolio management strategies.	T1, T2, R1	2	
	MID I EXAMINATION DURING EIGHTH WEEK					
4	CO4: Apply different equity valuation methods for the valuation of securities [K3].		**UNIT-4. COMMON STOCKS**			
		4.1	Basic Features of Common Stock,	T1, T2, R2	1	Chalk & Talk, PPT & Tutorial,
		4.2	Approaches to valuation–Balance sheet model: Book value method, liquidation value method, replacement cost,	T1, T2, R2	1	
		4.3	Dividend capitalization models: single period, multi period & constant growth model	T1, T2, R2	4	
		4.4	Earnings capitalization models; P/E ratio, Intrinsic value & Value earnings ratio.	T1, T2, R1	2	
5	CO5: Construct optimal portfolio for higher return at lower risk [K6].		**UNIT 5. PORTFOLIO THEORY**			
		5.1	Concept of portfolio. Portfolio return and risk. Harry Markowitz's Portfolio theory, construction of minimum risk portfolio	T1, T2, R2	6	Chalk & Talk, PPT, Tutorial, & Seminars
		5.2	The single-index model.	T1, T2, R1	3	
		5.3	Capital market theory: Introduction of risk-free asset, Capital Market Line (CML), Security Market line (SML). Capital asset pricing model (CAPM): over- pricing and under-pricing securities.	T1, T2, R2	3	
		5.4	Arbitrage pricing theory (APT): The Law of one price, two factor arbitrage pricing.	T1, T2, R1	2	
6	CO6: Analyze different schemes of mutual funds for better investment decision [K4].		**UNIT6:** MUTUAL FUNDS AND PORTFOLIO EVALUATION			
		6.1	Mutual funds - genesis, features, types and schemes.	T1, T2, R1	2	Chalk & Talk, PPT Tutorial, Active Learning & Seminars
		6.2	NAVs, costs, loads and return of mutual funds	T1, T2, R1	1	
		6.3	Problems and prospects in India, Regulation of mutual funds and investor's protection in India.	T1, T2, R1	1	
		6.4	Performance measures- Sharpe's reward to variability index, Treynor's reward to volatility index, Jensen's differential index, Fama's decomposition of returns.	T1, T2, R1	4	
				Total	68	
	MID II EXAMINATION DURING SIXTEENTH WEEK					
	END EXAMINATIONS					

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Text Books:

T1 Security Analysis and Portfolio Management, S. Kevin, PHI, New Delhi, 5th Edition 2015.

T2 Investment Analysis and Portfolio Management, Prasanna Chandra, TMH, New Delhi, 6th Edition, 2017.

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Reference Books:

R1 Security Analysis and Portfolio Management, Punithavathy Pandian, Vikas Publishing House, New Delhi, 2nd Edition, 2013.

R2 Fundamentals of Investment Management, V.K.Bhalla, S. Chand, New Delhi, 15th Edition, 2013.

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DEPARTMENT OF MBA

LESSON PLAN A:Y-2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R193THF3	Banking & Insurance	III	MBA	5	Batch I&II

COURSE OUTCOMES: Students are able to

CO1: Understand overview of Indian financial system and role of commercial banks [K1]
CO2: Classify different bank funds [K2]
CO3: Know the regulations in banking system.[K1]
CO4: Adapt the new banking innovations.[K6]
CO5: Understand about insurance sector and its related trends.[K1]
CO6: Explain the concept of general insurance and its types.[K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO 1: Understand overview of Indian financial system and role of commercial banks		**UNIT-I: INTRODUCTION TO BANKING**			
		1.1	Introduction to Indian Financial System	T1, T2, R1	10	Chalk & Talk, PPT, Active Learning & Tutorial
		1.2	Meaning of a Bank, Role of commercial banks in Economic Development	T1, T2, R1		
		1.3	Evolution of Banking in India– origin	T1, T2, R1		
		1.4	Nationalization, Banking sector reforms, CAMEL Approach, Sources of Bank Funds.	T1,R1		
2	CO2: Classify different bank funds.		**UNIT –II USES OF BANK FUNDS**			
		2.1	Features of Bank Credit - types of lending	T1, T2, R3	8	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		2.2	Assessment of credit worthiness of a prospective borrower - management of credit process	T1, T2, R3		
		2.3	Different types of loans and their features.	T1, T2, R3		
		2.4	Non Performing Assets: - Concept of NPAs, causes,	T1, T2, R3		
		2.5	Recovery of NPAs	T1		
3			**UNIT –III: REGULATION IN BANKING SYSTEM**			
		3.1	Regulation of Bank Capital: The need to regulate Bank Capital	T1, T2, R1		Chalk & Talk, PPT,
		3.2	Concept of Economic Model	T1, R1		

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	CO 3: Know the regulations in banking system	3.3	Concept of Regulatory Capital	T1, T2, R1	8	Tuto
		3.4	Basel Accords I,II	T1, T2, R1		
		3.5	Basel Accords III	T1		
4	CO4: Adapt the new banking innovations.	**UNIT –IV: BANKING INNOVATIONS**				
		4.1	Core Banking Solution - Retail Banking - Products & Services: Nature, Scope, Future and Strategies	T1, T2, R3	11	Chalk & Talk, PPT & Tutorial, , Industrial Visit, Demonstration with models.
		4.2	Plastic Money	T1, T2, R3		
		4.3	National Electronic Funds Transfer - ATM - Mobile Phone Banking	T1, T2, R3		
		4.4	Net Banking.	T1, T2, R3		
		4.5	Customer service quality in Indian banking industry.	T1,R3,		
5	CO5: Understand about insurance sector and its related trends.	**UNIT –V: INTRODUCTION TO INSURANCE**				
		5.1	Insurance as a Risk Management Tool- Principles of Insurance - Characteristics of Insurance Concept	T1, T2, R3	11	Chalk & Talk, PPT, Virtual labs, Tutorial, & Project based learning
		5.2	Functions of Insurers - Types of Insurers-	T1, T2, R3		
		5.3	Concept of Reinsurance, uses and advantages - Marketing channels: Agents & brokers – professionalism, remuneration,	T1, T2, R3		
		5.4	Responsibilities,classification, criteria for appointment and capital adequacy norms for broker - an overview of IRDA.	T1,T4,R1		
6	CO6: Explain the concept of general insurance and its types.	**UNIT –VI: LIFE INSURANCE AND GENERAL INSURANCE**				
		6.1	The concept of Life Insurance - Life Insurance Products- Classification of Life Insurance	T1, T2, R1,R3	12	Chalk & Talk, PPT Tutorial, Active Learning & Seminars
		6.2	Provisions of Life Insurance contracts - Special Life Insurance forms	T1, T2, R1,R3		
		6.3	Health and General insurance	T1, T2, R1,R4		
		6.4	Overview, Types, - Micro Insurance in India.	T1, T2, R1,R3		
		6.5	CASE Studies	T1,R3		
				Total	60	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

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TEXT BOOKS:

1. "Banking & Insurance",Vijayakumar P., Srinivasa Subbarao P., Himalaya Publication, New Delhi.
2. "Bank Management & Financial Services",Peter.S.Rose & Sylvia. C. Hudgins: Tata McGrawHill New Delhi, 2010,
3. "Risk Management & Insurance",James S. Trieschmann, Robert E. Hoyt & David. W. Sommer B:, Cengage Learning, New Delhi
4. "Banking & Insurance", Reddy K S and Rao R N: Paramount Publishing House 2013.

REFERENCES:

1. "Banks & Institutional Management", Vasant Desai: Himalaya Publishing House 2010.
2. "Banking and Insurance", R.K.Sharma, Shashi and Jagwant: , Kalyani Publishers, 16th edition.
3. "Fundamentals of Risk & Insurance", Emmett J. Vaughan & Therese M. Vaughan: Wiley, India Edition.
4. "Indian Insurance – A Profile", H. Narayanan: Jaico Publishing House, New Delhi.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet-522601 **Department of MBA**

LESSON PLAN-A.Y: 2024-25

PROGRAMME: MBA	
COURSE: **STM**	Semester : **III** CREDITS: **4**
COURSE CODE: **19MBA3TH01** REGULATION: **R19**	COURSE TYPE (CORE /ELECTIVE / BREADTH/ S&H): **BREADTH**
COURSE AREA/DOMAIN: **MANAGEMENT**	PERIODS: **6** Per Week.

COURSE OUTCOMES: The student is able to
CO1: Develop vision, mission and objectives of the organization. [K3]
CO2: Analyse industry and develop techniques of competitive analysis. [K4]
CO3: Appraise strategic leadership styles and actions. [K5]
CO4: Formulate effective strategies in business. [K6]
CO5: Develop a frame work for the implementation strategies in business. [K3]
CO6: Evaluate the strategy controls by measuring performance of organization. [K5]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Develop vision, mission and objectives of the organization. [K3]		**UNIT-1** INTRODUCTION TO STRATEGIC MANAGEMENT			
		1.1	Concepts in Strategic Management	T1, T2, R1	07	Chalk & Talk, PPT, Active Learning & Tutorial
		1.2	Developing a strategic vision, Mission,	T1, T2, R1		
		1.3	Objectives	T1, T2, R1		
		1.4	Policies	T1, T2, R1		
		1.5	Factors that shape a company's strategy	T1, T2, R1		
		1.6	Crafting a strategy			
2	CO2: Analyse industry and develop techniques of competitive analysis. [K4]		**UNIT-2** INDUSTRY ANALYSIS			
		2.1	Process, Techniques of industry analysis, Competitive Analysis: Process, Techniques of Techniques of competitive analysis.	T1, T2, R2	08	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		2.2	Competitive Analysis: Process, Techniques of Techniques of competitive analysis,	T1, T2, R1		

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		2.3	Environmental Scanning Methods and process, SWOT Analysis	T1, T2, R2		
		2.4	Strategies and competitive advantages in diversified companies and itsevaluation	T1, T2, R2		
3	CO3: Appraise strategic leadership styles and actions. [K5]	UNIT-3. : STRATEGIC ANALYSIS AND CHOICE				
		3.1	Tools and techniques.	T1, T2, R1	08	Chalk & Talk, PPT, Tutorial
		3.2	Leadership and Style	T1, T2, R1		
		3.3	Key Strategic Leadership Actions	T1, T2, R1		
		3.4	Developing Human Capital and Social Capital	T1, T2, R1		
		3.5	Human resource management	T1, T2, R1		
		3.6	Balanced Scorecard	T1, T2, R1		
MID I EXAMINATION DURING EIGHTH WEEK						
4	CO4: Formulate effective strategies in business. [K6]	UNIT-4. STRATEGY FORMULATION				
		4.1	Strategy Framework For Analysing Competition Porter's Value Chain Analysis	T1, T2, R2	07	Chalk & Talk, PPT & Tutorial,
		4.2	Formulation of strategy at corporate, business and functional levels. Types of Strategies	T1, T2, R2		
		4.3	Tailoring strategy to fit specific industry , Competitive Advantage of a Firm, Exit and Entry Barriers	T1, T2, R1		
		4.4	restructuring and diversification strategies ,different methods Turnaround strategy and diversification strategies	T1, T2, R1		
5	CO5: Develop a frame work for the implementation strategies in business. [K3]	UNIT-5. STRATEGY IMPLEMENTATION				
		5.1	Strategies for competing in Globalizing markets and internet economy	T1, T2, R2	08	Chalk & Talk, PPT, Tutorial, & Seminars
		5.2	Organizational Values and Their Impact on Strategy	T1, T2, R1		
		5.3	Resource Allocation , Planning systems for implementation	T1, T2, R1		
6	CO6: Evaluate the strategy controls by	UNIT-6. STRATEGY EVALUATION AND CONTROL				
		6.1	Establishing strategic controls Measuring performance , appropriate measures.	T1, T2, R1	08	Chalk & Talk, PPT Tutorial, Active
		6.2	Role of the strategist	T1, T2, R1		

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	measuring performance of organization. [K5]					Learning & Seminars
		6.3	using qualitative and quantitative benchmarking to evaluate performance	T1, T2, R1		
		6.4	problems in measuring performance ,Strategic surveillance strategic audit	T1, T2, R1		
				Total	54	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:

1. "Strategic Management" :Vijaya Kumar P,. Hitt A: Cengage learning, NewDelhi,2010.
2. "Cases Studies in Strategic Management" : Sanjay Mohapatra :, Pearson, NewDelhi,2012.

Reference Books:

1. "Strategic Management" : Adrian Haberberg&Alison, Oxford University Press, New Delhi, 2010 4
2. "Business Policy and Strategic Management": P.Subba Rao: Text and Cases, Himalaya Publishing House, New Delhi,2011.

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DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION

LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
19MBA3THH1	MIR (R19)	III	MBA	5	1

COURSE OUTCOMES: The student is able to

CO1: Analyse the basic concepts and importance of industrial relations management. [K4]
CO2: Identify the concept of Trade Unions. [K3]
CO3: Appraise the collective bargaining power. [K5]
CO4: Evaluate the benefits of quality of work life. [K5]
CO5: Analyse the concepts of labour safety measures. [K4]
CO6: Design the grievance management procedures. [K6]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT-1. INDUSTRIAL RELATIONS			
1	CO1: Analyse the basic concepts and importance of industrial relations management. [K4]	1.1	Concept- evolution	T1, T2, R1	08	Chalk & Talk, PPT, Active Learning & Tutorial
		1.2	present scenario in India	T1, T2, R1		
		1.3	Factors-Approaches to IR	T1, T2, R1		
		1.4	Industrial Relations in a Comparative Framework	T1, T2, R1		
		1.5	Labour market.	T1, T2, R1		
			UNIT-2 TRADE UNIONS			
2	CO2: Identify the concept of Trade Unions. [K3]	2.1	Introduction- nature and objectives of TU's	T1, T2, R2	08	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		2.2	Trade union act, 1926- Union Recognition - problems of Trade Unions	T1, T2, R1		
		2.3	registration of union-employer association.	T1, T2, R2		
		2.4	Management of Trade Union in India.	T1, T2, R2		
			UNIT-3. COLLECTIVE BARGAINING			
3	CO3: Appraise the collective bargaining power. [K5]	3.1	Nature, objectives	T1, T2, R1	10	Chalk & Talk, PPT, Tutorial
		3.2	process of collective bargaining	T1, T2, R1		
		3.3	changes in labour	T1, T2, R1		
		3.4	management relations in post-liberalized India	T1, T2, R1		
		3.5	Public sector bargaining in India.	T1, T2, R1		
		3.6	Bipartism, Tripartism bodies	T1, T2, R1		

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MID I EXAMINATION DURING EIGHTH WEEK							
4	CO4: Evaluate the benefits of quality of work life. [K5]	UNIT-4. QUALITY OF WORK LIFE					
		4.1	Workers' participation in Management-different levels of participation	T1, T2, R2	10	Chalk & Talk, PPT & Tutorial,	
		4.2	quality circles-parameters of QWL	T1, T2, R2			
		4.3	Nature of wages and types-Incentives and fringe benefits	T1, T2, R1			
		4.4	Issues in wage determination in India.	T1, T2, R1			
5	CO5:Analyse the concepts of labour safety measures. [K4]	UNIT 5 SOCIAL SECURITY					
		5.1	Nature, types of security	T1, T2, R2	08	Chalk & Talk, PPT, Tutorial, & Seminars	
		5.2	health and occupational safety measures in India	T1, T2, R1			
		5.3	Employees state insurance Act, workmen compensation Act its implications.	T1, T2, R1			
6	CO6:Design the grievance management procedures. [K6]	UNIT6: EMPLOYEE GRIEVANCE					
		6.1	Causes of grievance- conciliation-Arbitration-and adjudication	T1, T2, R1	10	Chalk & Talk, PPT Tutorial, Active Learning & Seminars	
		6.2	process of settlement of employee grievance-Standing orders- code of conduct	T1, T2, R1			
		6.3	Industrial dispute nature and scope of industrial disputes	T1, T2, R1			
		6.4	Disputes-prevention and settlement of industrial disputes in India, Id act.	T1, T2, R1			
				Total	54		
MID II EXAMINATION DURING EIGHTEENTH WEEK							
END EXAMINATIONS							

Text Books:

T1 Industrial Relations Oxford university : C.S Venkata Ratnam: press, New Delhi, 2011.

T2 Industrial Relations: Arun Monappa, TMH, New Delhi.2012

Reference Books:

R1 Dynamics of Industrial Relations : Mamoria, Himalaya publishing house, New Delhi, 2010

R2 "Industrial Relations, Trade unions and Labor Legislation"Sinha:, pearson education, New Delhi, 2013

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NARASARAOPETA ENGINEERING COLLEGE (AUTONOMOUS) NARASARAOPET-522601, Palnadu (Dist.), A.P.

NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet-522601 **Department of MBA**

LESSON PLAN-A.Y: 2024-25

PROGRAMME: MBA	
COURSE: **CRM**	Semester : **III** CREDITS: **4**
COURSE CODE: **19MBA3THH2** REGULATION: **R19**	COURSE TYPE (CORE /ELECTIVE / BREADTH/ S&H): **BREADTH**
COURSE AREA/DOMAIN: **MANAGEMENT**	PERIODS: **6** Per Week.

COURSE OUTCOMES: The student is able to

CO1: Outline basic concepts, framework and theories of compensation. [K2] CO2: Develop a strategic plan for making compensation as a competitive advantage to the organization. [K6] CO3: Contrast different types of incentive plans and determine which plan suit best to organization. [K2] CO4: List the different types of employee benefits. [K1] CO5: Design different methods of wage determination applicable to different cadres of employees. [K6] CO6: Evaluate the mechanism of wage boards and its role in fixation of wage. [K5]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Outline basic concepts, framework and theories of compensation. [K2]	**UNIT-1** INTRODUCTION TO COMPENSATION				
		1.1	Types of compensations	T1, T2, R1	07	Chalk & Talk, PPT, Active Learning & Tutorial
		1.2	Conceptual Framework of Compensation Management,	T1, T2, R1		
		1.3	Theories of wages	T1, T2, R1		
		1.4	Wage Fund Theory, Marginal Productivity theory	T1, T2, R1		
		1.5	Bargaining theory	T1, T2, R1		
		1.6	Criteria of wage fixation			
2	CO2: Develop a strategic plan for making compensation as a competitive advantage to the organization. [K6]	**UNIT-2** STRATEGIC COMPENSATION PLANNING				
		2.1	Strategic perspectives towards compensation	T1, T2, R2	08	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		2.2	Developing a total compensation strategy	T1, T2, R1		
		2.3	Source of competitive advantage	T1, T2, R2		

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		2.4	Three tests, designing pay levels, Mix and pay structures.	T1, T2, R2		
3	CO3: Contrast different types of incentive plans and determine which plan suit best to organization. [K2]	**UNIT-3.** VARIABLE PAY				
		3.1	Strategic reasons for Incentive plans	T1, T2, R1	08	Chalk & Talk, PPT, Tutorial
		3.2	Administering incentive plans, Individual incentive plans, Piecework	T1, T2, R1		
		3.3	Standard hour plan, Bonuses, Merit Pay,	T1, T2, R1		
		3.4	Team compensation	T1, T2, R1		
		3.5	Group incentive plans	T1, T2, R1		
		3.6	Gain sharing incentive Profit Sharing plans, Stock Options, ESOPs.	T1, T2, R1		
MID I EXAMINATION DURING EIGHTH WEEK						
4	CO4: List the different types of employee benefits. [K1]	**UNIT-4.** MANAGING EMPLOYEE BENEFITS				
		4.1	Nature and types of benefits, Employee benefits programs-security benefits	T1, T2, R2	07	Chalk & Talk, PPT & Tutorial,
		4.2	retirement security benefits, health care benefits, time-off benefits, benefits of administration	T1, T2, R2		
		4.3	discretionary major employee benefits, employee services	T1, T2, R1		
		4.4	Designing a benefits package	T1, T2, R1		
5	CO5: Design different methods of wage determination applicable to different cadres of employees. [K6]	**UNIT-5.** WAGE DETERMINATION				
		5.1	Principles of wage and salary administration, Methods of wage determination in India;	T1, T2, R2	08	Chalk & Talk, PPT, Tutorial, & Seminars
		5.2	Internal and External Equity in Compensation Systems	T1, T2, R1		
		5.3	Wage Administration in India: Wage Policy in India.	T1, T2, R1		
6	CO6: Evaluate the mechanism of wage boards and its role in fixation of wage [K5]	**UNIT-6.** WAGE BOARDS AND THEIR COMPENSATION PRACTICES				
		6.1	Structure, Scope of Compensation practices	T1, T2, R1	08	Chalk & Talk, PPT Tutorial, Active Learning & Seminars
		6.2	Function Of CRM	T1, T2, R1		
		6.3	Compensation practices in different industries	T1, T2, R1		

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		6.4	Compensation practices of multinational and global organizations.	T1, T2, R1		
				Total	54	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:

1. Customer Relation Management, H.Peeru Mohamed and A.Sahadevan, Vikas Publishing2005.
2. The Eight Competencies of Relationships selling, Jim Catheart, Macmillan India, 2005.
3. Consumer Behavior, Assel, Cengage Learning, 6thEdition.

Reference Books:

1. Consumer Behaviour, David L Loudon and Albert J Della Bitta, 4/e, TMH, New Delhi, 2002. 2. Consumer Behaviour, Schiffman, L.G and Kanuk L.L, 8/e, Pearson Education, New Delhi, 2003. 3. Consumer Behaviour, Roger D. Black Well et al, 9/e Cengage, New Delhi,2012.

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NARASARAOPET - 522601, Palnadu (Dist.), A.P

NEC	**Narasaraopeta Engineering College** **(Autonomous)** **Yallmanda(Post), Narasaraopet- 522601**

DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
	CB&CRM	III	MBA	5	1

COURSE OUTCOMES: The student is able to

CO1: Outline the basic concepts of Customer Relationship Management. [K2]
CO2: Appraise the customer profile and perception of customer behaviour in relationship perspectives. [K4]
CO3: Analyse strategies for customer acquisition models of CRM. [K4]
CO4: Evaluate the consumer behaviour and business strategies. [K5]
CO5: Apply the various consumer behaviour models. [K3]
CO6: Build the psychological process and develop the effective strategy in terms of impact on consumer behaviour. [K6]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT-I: INTRODUCTION TO CRM			
1	CO1: Outline the basic pts of Customer Relationship gement. [K2]	1.1	Definitions - Concepts	T1, T2, R1	08	Chalk & Talk, PPT, Active Learning & Tutorial
		1.2	Concepts and Context of relationship	T1, T2, R1		
		1.3	Evolution	T1, T2, R1		
		1.4	Transactional Vs Relationship Approach	T1, T2, R1		
		1.5	CRM as a strategic marketing tool – CRM significance to the stakeholders.	T1, T2, R1		
			UNIT-2 UNDERSTANDING CUSTOMERS			
2	CO2: Appraise the customer e and perception of customer viour in relationship ectives. [K4]	2.1	Customer Profile Analysis	T1, T2, R2	08	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		2.2	Customer Profile Analysis	T1, T2, R1		
		2.3	Customer perception, Expectations analysis	T1, T2, R2		
		2.4	Customer behavior in relationship perspectives;	T1, T2, R2		
			UNIT-3. CRM STRUCTURES			
3	CO3:Analyse strategies for mer acquisition models of . [K4]	3.1	CRM Process – Strategies for Customer acquisition –	T1, T2, R1	10	Chalk & Talk, PPT, Tutorial
		3.2	Retention.	T1, T2, R1		
		3.3	Strategies for Customer acquisition	T1, T2, R1		
		3.4	Retention and Prevention of	T1, T2, R1		

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		3.5	Models of CRM	T1, T2, R1			
		3.6	CRM road map for business applications.	T1, T2, R1			
MID I EXAMINATION DURING EIGHTH WEEK							
		UNIT-4. INTRODUCTION TO CONSUMER BEHAVIOUR					
4	CO4:Evaluate the consumer iour and business strategies.	4.1	Understanding consumers and market Segments.	T1, T2, R2	10	Chalk & Talk, PPT & Tutorial,	
		4.2	Evolution of consumer Behaviour,	T1, T2, R2			
		4.3	consumer analysis	T1, T2, R1			
		4.4	Business strategy.	T1, T2, R1			
		UNIT 5 CONSUMER BEHAVIOR MODELS					
5	CO5: Apply the various mer behaviour models. [K3]	5.1	Howard Model, Howard- Sheth Model, EKB Model, Webster and Wind Model and Sheth	T1, T2, R2	08	Chalk & Talk, PPT, Tutorial, & Seminars	
		5.2	Industrial Buyer Behaviour Model. Social	T1, T2, R1			
		5.3	Cultural Influences, Social Stratification, Reference Groups and Family, Personal influence.	T1, T2, R1			
		UNIT6: PSYCHOLOGICAL FOUNDATIONS OF CONSUMER BEHAVIOR					
6	CO6:Build the psychological ss and develop the effective gy in terms of impact on mer behaviour. [K6]	6.1	Consumer Motivation, Perception, Personality and Behavior.	T1, T2, R1	10	Chalk & Talk, PPT Tutorial, Active Learning & Seminars	
		6.2	Learning and Behavior Modification, Information Processing.	T1, T2, R1			
		6.3	Memory Organization and Function.	T1, T2, R1			
		6.4	Attitude Formation and Attitude Change.	T1, T2, R1			
				Total	54		
MID II EXAMINATION DURING EIGHTEENTH WEEK							
END EXAMINATIONS							

Text Books:

T1 "1. Customer Relation Management, H.Peeru Mohamed and A.Sahadevan, Vikas Publishing2005.

T2 The Eight Competencies of Relationships selling, Jim Catheart, Macmillan India, 2005.

Reference Books:

R1 . Consumer Behaviour, David L Loudon and Albert J Della Bitta, 4/e, TMH, New Delhi, 2002.

R2 Consumer Behaviour, Schiffman, L.G and Kanuk L.L, 8/e, Pearson Education, New Delhi, 2003.
Consumer Behaviour, Schiffman, L.G and Kanuk L.L, 8/e, Pearson Education, New Delhi, 2003.

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Narasaraopeta Engineering College
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Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN-A.Y-2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Credits	Sections
19MBA4TH01	LSCM (R19)	IV	MBA	6	4	2 (A&B)

COURSE OUTCOMES: The student is able to

CO1: Outline the basic concepts of Logistics and Supply Chain. (K1)
CO2: Analyze different logistics strategies to get competitive advantage. (K4)
CO3: Assess the profitability by measuring the logistics performance (K5)
CO4: Appraise the logistics and supply chain relationships (K5)
CO5: Design effective sources of suppliers and pricing of the products. (K6)
CO6: Adapt new and global strategies to compete with the rivals (K6)

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
1	CO1: Outline the basic concepts of Logistics and Supply Chain. (K1)	**UNIT-1. INTRODUCTION TO LOGISTICS AND SUPPLY CHAIN MANAGEMENT**				
		1.1	Definition, Nature and Scope of Logistics and Supply Chain Management	T1,T2, R1	3	Chalk & Talk, PPT,
		1.2	Focus areas in Supply Chain Management	T1,T2, R1	2	Chalk & Talk, PPT, & Tutorial
		1.3	Customer service and retention	T1,T2, R1	2	Chalk & Talk, PPT,
		1.4	Basic service capability Value added services	T1,T2, R1	1	Chalk & Talk
		ASSIGNMENT-I EXAMINATION				
2	CO2: Analyze different logistics strategies to get competitive advantage. (K4)	**UNIT-2. LOGISTICS AND COMPETITIVE STRATEGY**				
		2.1	Competitive advantage – Gaining Competitive advantage through logistics	T1,T2, R1	3	Chalk & Talk Case Study
		2.2	Integrated supply chains	T1,T2, R1	3	Chalk & Talk Seminars
		2.3	Competitive performance - Models in Logistics Management	T1, T2,R1	3	Chalk & Talk
3	*CO3:* Assess the profitability by measuring the logistics performance (K5)	**UNIT-3. MEASURING LOGISTICS COSTS AND PERFORMANCE**				
		3.1	The concept of Total Cost analysis – Principles of logistics costing	T1, T2, R1	3	Chalk & Talk, Tutorial
		3.2	Logistics and the bottom-line – Impact of Logistics on shareholder value	T1, T2, R1	2	Chalk & Talk
		3.3	customer profitability analysis –direct product profitability	T1, T2, R1	2	Chalk & Talk
		3.4	– cost drivers and activity-based costing.	T1, T2, R1	2	Chalk & Talk
		MID I EXAMINATION DURING EIGHTH WEEK				

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		UNIT-4. LOGISTICS AND SUPPLY CHAIN RELATIONSHIPS				
4	CO4: Appraise the logistics and supply chain relationships (K5)	4.1	Benchmarking the logistics process and SCM operations	T1, R2	2	Chalk & Talk
		4.2	Mapping the supply chain processes	T1,T2,R 3	2	PPT
		4.3	Supplier and distributor benchmarking	T1,T2, R3	2	PPT & Tutorial
		4.4	setting benchmarking priorities	T1,T2, R3	2	Chalk & Talk
		4.5	identifying logistics performance indicators	T1,T2, R3	2	Chalk & Talk
		4.6	Channel structure	T1,T2, R3	2	Chalk & Talk
		ASSIGNMENT-II EXAMINATION				
5	CO5: Design effective source of suppliers and pricing of the products. (K6)	UNIT 5. SOURCING, TRANSPORTING AND PRICING PRODUCTS				
		5.1	Sourcing decisions and transportation in supply chain	T1,T2, R3	2	Chalk & Talk, PPT
		5.2	infrastructure suppliers of transport services	T1, T3,R3	2	Chalk & Talk
		5.3	transportation economics and pricing – documentation	T1,T2, R3	2	Chalk & Talk
		5.4	Pricing and revenue management - Bullwhip Effect – CRM.	T1,T3,R1	2	Chalk & Talk
6	CO6: Adapt new and global strategies to compete with the rivals (K6)	UNIT6: MANAGING GLOBAL LOGISTICS				
		6.1	Logistics in a Global Economy – Views of Global Logistics	T1,T2, R3	3	Chalk & Talk,
		6.2	Global Operating Levels – Interlinked Global Economy	T1,T2, R3	3	PPT
		6.3	Global Strategy –Global Purchasing – Global Logistics	T1,T2, R3	3	PPT & Seminars
		6.4	Channels in Global Logistics –Global Alliances.	T1, T3,R3	3	Chalk & Talk
				Total	62	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

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Text Books:

T1 Logistics and Supply Chain Management: Strategies for Reducing Cost and improving Service. Martin Christopher, Pearson Education, 2007.

T2 Edward J Bradi, John J Coyle: "A Logistics Approach to Supply Chain Management, Cengage Learning, New Delhi, 2012.

Reference Books:

R1: D.K.Agrawal: "Distribution and Logistics Management", MacMillan Publishers, 2011.

R2 : Sunil Chopra and Peter Meindl: "Supply chain Management: Strategy, Planning and Operation Pearson Education, New Delhi 2013

R3 : Rahul V Altekar: Supply Chain Management, PHI Learning Ltd, New Delhi, 2009.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Credits
19MBA4TH02	ED (R19)	IV	MBA	5	4

COURSE OUTCOMES: The student is able to

CO1: Identify the importance of entrepreneurship. [K2]
CO2: Analyse entrepreneurship development programs in India and contents for training forentrepreneurial competencies. [K4]
CO3: Develop creativity in entrepreneurship. [K6]
CO4: Design the project reports & make project evaluation. [K6]
CO5: Analyse the policies and procedures of small and micro enterprises. [K4]
CO6: Appraise the institutional support to small and medium enterprises. [K5]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Identify the importance of entrepreneurship. [K2]		**UNIT – I: Entrepreneurship**			
		1.1	Concept of Entrepreneurship	T1, T2, R1	1	Chalk & Talk, Active Learning & Tutorial
		1.2	Characteristics of Entrepreneur	T1, T2, R1	2	
		1.3	Qualities of Entrepreneur	T1, T2, R1	1	
		1.4	Role of Entrepreneurship in economic development	T1, T2, R1	3	
		1.5	Ethics and Social Responsibilities	T1, T2, R1	2	
		1.6	Concept of Women Entrepreneurship	T1, T2, R1	2	
2	CO2: Analyse entrepreneurship development programs in India and contents for training for entrepreneurial competencies. [K4]		**UNIT – II: Entrepreneurship Development programmes**			
		2.1	Designing Appropriate Training Programme to inculcate Entrepreneurial	T1, T2, R2	4	Chalk & Talk, Tutorial, Active Learning & Case Study
		2.2	Training for Entrepreneurs, entrepreneurship development programmes	T1, T2, R1	4	
		2.3	Need and objectives.	T1, T2, R2	1	
3	CO3: Develop creativity in entrepreneurship. [K6]		**UNIT – III: Creativity and Entrepreneurship**			
		3.1	Concept of creativity,	T1, T2, R1	1	Chalk & Talk, Tutorial
		3.2	Nature and characteristics of creativity,	T1, T2, R1	2	
		3.3	Factors affecting creativity	T1, T2, R1	2	
		3.4	Creativity process.	T1, T2, R1	1	
MID I EXAMINATION DURING EIGHTH WEEK						
4	CO4: Design the project reports & make project evaluation. [K6]		**UNIT – IV: Project Planning and Evaluation of Projects**			
		4.1	Growth of Firm	T1, T2, R2	1	Chalk & Talk, & Tutorial,
		4.2	Project identification and selection	T1, T2, R2	3	
		4.3	Project identification and selection	T1, T2, R1	3	
		4.4	Factors inducing growth, study and Post planning of Project	T1, T2, R1	4	

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5	CO5: Analyse the policies and procedures of small and micro enterprises. [K4]	UNIT-V: Small and Micro Enterprises				
		5.1	Concept of MSMEs Importance of MSMEs Policies and their support to MSMEs	T1, T2, R2	3	Chalk & Talk, Tutorial, & Seminars
		5.2	Growth of firm. Factors inducing growth growth strategies	T1, T2, R1	2	
		5.3	Sickness in small business and remedies	T1, T2, R1	2	
6	CO6: Appraise the institutional support to small and medium enterprises. [K5]	**UNIT-VI: Institutional support to entrepreneur and MSMEs**				
		6.1	Concept of MSMEs Importance of MSMEs Policies and their support to MSMEs	T1, T2, R1	3	Chalk & Talk, Tutorial, Active Learning & Seminars
		6.2	Growth of firm. Factors inducing growth growth strategies Sickness in small business and remedies Financial Institutions Commercial Banks	T1, T2, R1	5	
		6.3	Entrepreneurial Development Institutes	T1, T2, R1	1	
		6.4	Entrepreneurial Development Universities and other Educational Institutions offering Entrepreneurial Development Programme	T1, T2, R1	4	
				Total	57	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:

1. Dave Evans., Susan Bratton, [2008]. Social Media Marketing: An Hour a Day. ,2nd edition, Wiley
2. Dave Evans., Susan Bratton, [2010]. Social Media Marketing: The Next Generation of Business Engagement. Wiley
3. Your Google Game Plan for Success: Increasing Your Web Presence with Google AdWords, Analytics and Website Optimizer, Joe Teixeira, Wiley 2010
4. Michael Miller, B2B Digital Marketing, 1e, Pearson, 2014.

Reference Books:

1. Vandana Ahuja, Digital marketing, Oxford University Press 2015.
2. Michael R Solomon, Tracy Tuten, Social Media Marketing, Pearson, 1e, 2015.
3. Judy Strauss & Raymond Frost, E-Marketing, Pearson, 2016.
4. Richard Gay, Alan Charles worth and Rita Esen, Online marketing – A customer led approach Oxford University Press 2007.
5. Arup Varma, Pawan S. Budhwar, Angelo S. De Nisi, Digital Marketing, Wiley, 2016.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF MBA
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
19MBA4THF1	Financial Risk Management & Derivatives	IV	MBA	6	Batch – A &B

COURSE OUTCOMES: Students are able to

CO1: Analyse the different types of risks and its impact on financial institutions. [K4]
CO2: Measure different type's risks by applying various tools and techniques. [K5]
CO3: Appraise the role and importance of derivatives. [K5]
CO4: Evaluate the forward and future contracts and its pricing. [K4]
CO5: Minimise the risk of financial institutions by using Swaps. [K6]
CO6: Build the option strategies in order to minimise the risk. [K6]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO 1.[K4]** Analyse the different types of risks and its impact on financial institutions		**Unit-1. Introduction To Risk Management**			
		1.1	Concept, nature and scope of risk. Risk Management Process	T1, T2, R1	8	Chalk & Talk, PPT
		1.2	Types of risk: interest rate risk, credit risk, market risk and capital market risk.	T1, T2, R1		
		1.3	An integrated approach to corporate risk management and methods, Comprehensive view of Risk in Financial Institutions.	T1, T2, R1		
		1.4	Risk reporting process–internal and external.	T1,R1		
2	**CO2.[K5]** Measure different type's risks by applying various tools and techniques.		**Unit-2. Measurement and Management of Risk**			
		2.1	Value at risk (VaR), Problems	T1, T2, R1	09	Chalk & Talk, PPT & Case Study
		2.2	Cash flow at risk (CaR),Problems	T1, T2, R1		
		2.3	VaR and CaR to make investment decisions.	T1, T2, R1		
		2.4	Non- Insurance methods of Risk management vs. Risk avoidance, Loss Control, Risk retention and Risk transfer	T1, T2, R1		
		2.5	Asset-Liability Management (ALM).	T1,R1		
MID I EXAMINATION DURING SIXTH WEEK						
3	**CO 3[K5]** Appraise the role and importance of derivatives		**Unit-3 Techniques And Tools Of Risk Management**			
		3.1	The concept and importance of Derivatives	T1, T2,		
		3.2	Types of Derivatives.	T1, T2,		Chalk & Talk, PPT
		3.3	The role of Derivative securities to manage risk and to exploit opportunities to enhance returns.	T1, T2, R1	08	

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		3.4	Players in the stock/ derivative market: Individuals, speculators, hedgers, arbitrageurs and other participants in Derivatives Market	T1, T2, R1		
4	**CO 4.[K4]** Evaluate the forward and future contracts and its pricing.	**Unit-4.** Forward Contracts				
		4.1	Definition, features and pay-off profile of Forward contract,	T1, T2, R2	10	Chalk & Talk, PPT &Case Study
		4.2	Valuation of forward contracts.	T1, T2, R2		
		4.3	Forward Contracts to manage Commodity price risk, Interest rate risk and exchange rate risk- limitations of Forward contract.	T1, T2, R2		
		4.4	Futures contracts: Definition of future contracts. Clearing house, margin requirements, marking to the market.	T1, T2, R2		
		4.5	Valuation of futures contracts. Risk management with Futures contracts.	T1		
5	**CO 5.[K6]** Minimise the risk of financial institutions by using Swaps	**Unit 5. Techniques And Tools Of Risk Management**				
		5.1	SWAPS; Definition and features. Types of swaps.	T1, T2, R3	13	Chalk & Talk, PPT, & Case Study
		5.2	Interest rate swaps, Currency swaps, equity swap, credit default swap & commodity swap.	T1, T2, R3		
		5.3	Valuation & Pricing of interest rate Swaps. Currency Swaps:	T1, T2, R2		
		5.4	Types of Currency Swaps. Valuation & Pricing of currency swaps.	T1,R2		
6	**CO 6. [K3]** Build the option strategies in order to minimise the risk.	**Unit 6.** Techniques And Tools Of Risk Management				
		6.1	Options; Definition of an option. Types of options: call option, put option.	T1, T2, R1	12	Chalk & Talk, PPT & Case Study
		6.2	Style of option: American option and European option.	T1, T2, R1		
		6.3	Options in the money, at the money and out of the money.	T1, T2, R1		
		6.4	Pay-off option positions, Pricing of call and put options at expiration and before expiration.	T1, T2, R1		
		6.5	The Binominal option pricing model (BOPM): assumptions - single and two period models	T2,R1		
				Total	60	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1 Financial Risk Management, Vijayakumar P., Naidu.BVR, Venkateswarlu.Ch. Himalaya Publication, New Edition, 1st Edition, 2015.
T2 Fundamentals of Financial Derivatives, Prafulla Kumar Swain., Himalaya Publishing House, 1st Edition, 2012
T3 Derivatives and Risk Management, Dhanesh Kumar Khatri , MacMillon,2nd Edition, 2012

Reference Books:

R1 Options, Futures and Other Derivatives ,John C. Hull & Sankarshan Basu, 7th Edition, Pearson Education.
R2 Bank Management & Financial Services : Peter S. Rose & Sylvia C. Hudgins, , 7th Edition, Tata McGraw-Hill.
R3 Derivatives Valuation and Risk Management, Rajiv Srivastava , Oxford University Press.2nd Edition, 2012

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN A.Y:2024-25

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
19MBA4THF3	IFM (R19)	IV	MBA	6	2(A&B)

COURSE OUTCOMES: The student is able to

CO1: Evaluate the functioning of international financial system and monetary system [K5].
CO2: Analyse the international financial markets and the various international financial instruments [K4].
CO3: Analyse the advantages of foreign exchange market [K4].
CO4: Identify and evaluate foreign direct investments [K3].
CO5: Develop strategies to deal with different types of risks associated with MNC's [K6].
CO6: Deign strategies to deal with international tax environment [K6].

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Evaluate the functioning of international financial system and monetary system [K5].		**UNIT-1 INTRODUCTION TO INTERNATIONAL FINANCIAL MANAGEMENT**			
		1.1	Nature and scope and importance of international financial management	T1, T2, R1	2	Chalk & Talk, PPT, Active Learning & Tutorial
		1.2	International Financial System, functions and component	T1, T2, R1	1	
		1.3	international monetary system: Evolution of international monetary system: gold standard, interwar period	T1, T2, R1	4	
		1.4	Bretton woods system	T1, T2, R1	1	
		1.5	fixed vs floating exchange rate system	T1, T2, R1	2	
		1.6	Currency board, monetary union.	T1, T2, R1	2	
2	CO2: Analyse the international financial markets and the various international financial instruments [K4].		***UNIT-2*** **INTERNATIONAL FINANCIAL MARKETS**			
		2.1	Eurocurrency market	T1, T2, R1	1	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		2.2	International bond market, international equity market, international money market.	T1, T2, R1	2	
		2.3	Global financial institutions–IMF, Bank for International Settlements; international banking- euro bank.	T1, T2, R2	2	
		2.4	International financial instruments–euro CP.	T1, T2, R2	1	
		2.5	Eurobonds, foreign bonds, global bonds.	T1, T2, R1	1	
		2.6	Euro equity, ADR, GDRs.	T1, T2, R1	2	

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3	CO3: Analyse the advantages of foreign exchange market [K4].	*UNIT –3: FOREIGN EXCHANGE MARKET*					
		3.1	Concept, features and Participants in foreign exchange market	T1, T2, R1	2	Chalk & Talk, PPT, Tutorial	
		3.2	structure of foreign exchange market in India; quotes in spot market and forward market	T1, T2, R1	2		
		3.3	Arbitrage in Foreign exchange Market-triangular arbitrage	T1, T2, R1	1		
		3.4	Nominal effective exchange rate (NEER), real effective exchange rate (REER); Foreign Exchange Management Act	T1, T2, R1	1		
		3.5	Parity Conditions- Purchasing Power Parity, Interest Rate Parity, International Fisher Effect	T1, T2, R1	4		
		3.6	International debt crises and currency crises-Asian currency crisis, Greek debt crisis.	T1, T2, R1	2		
MID I EXAMINATION DURING EIGHTH WEEK							
4	CO4: Identify and evaluate foreign direct investments [K3].	**UNIT-4. : MULTINATIONAL CORPORATE DECISIONS IN GLOBAL MARKETS**					
		4.1	Foreign direct investment (FDI) and motives	T1, T2, R2	1	Chalk & Talk, PPT & Tutorial,	
		4.2	FDI theories-theory of comparative advantage, OLI paradigm of FDI in India	T1, T2, R2	2		
		4.3	Modes of foreign investment– licensing, management contracts, joint venture, Greenfield investment, acquisition, strategic alliance	T1, T2, R2	2		
		4.4	International capital budgeting	T1, T2, R1	2		
		4.5	International cash management, multinational capital structure decision, cost of capital	T1, T2, R1	3		
5	CO5: Develop strategies to deal with different types of risks associated with MNC's [K6].	**UNIT 5. RISK MANAGEMENT IN MULTINATIONAL CORPORATIONS**					
		5.1	Types of risk-currency risk, transaction exposure, translation exposure, accounting standard for translation exposure in India,	T1, T2, R2	2	Chalk & Talk, PPT, Tutorial, & Seminars	
		5.2	Economic exposure and assessment	T1, T2, R1	2		
		5.3	Interest rate risk, country risk assessment–political risk, financial risk	T1, T2, R2	2		
		5.4	Risk management through hedging-natural hedges, hedges with currency derivatives–forward market hedge, options market hedge	T1, T2, R1	2		
		5.5	Money market hedge, hedging recurrent exposure through swaps, hedging contingent exposure through invoice currency.	T1, T2, R1	2		
6	CO6: Deign strategies to deal with international tax environment [K6].	*UNIT6:* **INTERNATIONAL TAX ENVIRONMENT**					
		6.1	Types of tax–income tax, withholding tax, value added tax, Tobin tax	T1, T2, R1	1	Chalk & Talk, PPT Tutorial, Active Learning & Seminars	
		6.2	Taxation methods–worldwide approach, territorial approach; tax havens, offshore financial centers, re invoicing centre	T1, T2, R1	2		
		6.3	Tax treaties- Double taxation Avoidance agreement, multilateral tax treaties; foreign tax credit, tax neutrality tax equity, taxes and the location of foreign operations	T1, T2, R1	3		

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		6.4	Tax implications of dividend remittance by overseas affiliate, taxes and organizational form–controlled foreign corporation;	T1, T2, R1	2	
		6.5	Taxation of foreign source income in India; Transfer pricing (TP) and tax planning–TP methods, TP rules in India	T1, T2, R1	3	
				Total	64	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1 International Financial Management, Eun C.S., Resnick B.G: Tata McGraw Hill Education Pvt. New Delhi2010.

T2 International Financial Management, Sharan V., PHI Learnings, New Delhi,2012.

Reference Books:

R1 International Financial Management, MadhuVij: Excel Books, New Delhi,2011.

R2 International Financial Management, V.A.Avadhani: Himalaya Publication,2013.

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601 Department of MBA

LESSON PLAN-A.Y: 2024-25

PROGRAMME: MBA	
COURSE: LEADERSHIP	Semester: IV CREDITS: 4
COURSE CODE: 19MBA4THH2 REGULATION: R19	COURSE TYPE (CORE /ELECTIVE / BREADTH/ S&H): ELECTIVE
COURSE AREA/DOMAIN: MANAGEMENT	PERIODS: 6 Per Week.

COURSE OUTCOMES: The student is able to

CO1: Identify the leadership qualities to run an organization successfully. [K3]
CO2: Appraise the various behavioural concepts. [K5]
CO3: Develop the organizational structures in decision making. [K3]
CO4: Analyze the interpersonal behaviour and barriers of communication in leadership styles. [K4]
CO5: Assess the impact of group conflicts in the organization. [K5]
CO6: Adopt different kinds of inspirational leadership styles to lead teams in effective way. [K6]

Unit No	Outcome		Topics/Activity	Ref /Text book	Total Periods	Delivery Method
1	CO1: Identify the leadership qualities to run an organization successfully. [K3		**UNIT-1 ORGANISATION**			
		1.1	Management, Leadership Traits	T1, T2, R1	10	Chalk & Talk, PPT, Active Learning & Tutorial
		1.2	Skills and styles of a leader, Meaning and Significance.	T1, T2, R1		
		1.3	Qualities of a good leader	T1, T2, R1		
		1.4	Trait Theory-,Blake and Mountan	T1, T2, R1		
		1.5	Other functions of Management.	T1, T2, R1		
			ASSIGNMENT EXAMINATIONS-I			
2	CO2: Appraise the various behavioural concepts. [K5]		**UNIT-2 BEHAVIOURAL CONCEPTS**			
		2.1	Individual Behaviour,Perception ,process and factors of perception	T1, T2, R2	12	Chalk & Talk, PPT Tutorial, Active Learning & Case Study
		2.2	Learning-types and factors of learning Attitude Formation and Change	T1, T2, R1		
		2.3	Motivation Theories-Maslow's theory, Herzbergs,McClellands, Alderfer's ERG Theory, X and Y theory – Personality Development	T1, T2, R2		
		2.4	Herzbergs, McClellands, Alderfer's ERG Theory, X and Y theory, Personality Development	T1, T2, R2		
3	CO3: Develop the organizational structures in decision making. [K3]		**UNIT-3. DECISIONMAKING**			
		3.1	Leadership for sustainability	T1, T2, R2	10	Chalk & Talk, PPT,
		3.2	Power Influence Impact of Leadership	T1, T2, R2		

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		3.3	Leadership Practices	T1, T2, R1		Tutorial
		3.4	Organizational Culture	T1, T2, R1		
		3.5	Leadership In Business Organizations.	T1, T2, R1		
		3.6	Organizational Structures	T1, T2, R1		
MID I EXAMINATION DURING EIGHTH WEEK						
4	CO4: Analyze the interpersonal behaviour and barriers of communication in leadership styles. [K4]	UNIT-4. INTERPERSONAL BEHAVIOUR				
		4.1	Communication Process.	T1, T2, R2	10	Chalk & Talk, PPT & Tutorial,
		4.2	Contents of Communication ,Barriers of Communication Leadership Styles.	T1, T2, R2		
		4.3	Leadership Styles Influencing Relations	T1, T2, R1		
		4.4	Transactional Analysis.	T1, T2, R1		
		ASSIGNMENT EXAMINATIONS-II				
5	CO5: Assess the impact of group conflicts in the organization. [K5]	UNIT-5. GROUP DYNAMICS				
		5.1	Roles, Morale, Conflicts ,Groups	T1, T2, R2	10	Chalk & Talk, PPT, Tutorial, & Seminars
		5.2	Inter Group Behaviour, Inter Group Collaboration	T1, T2, R1		
		5.3	Conflict Management	T1, T2, R1		
6	CO6: Adopt different kinds of inspirational leadership styles to lead teams in effective way. [K6] SYLLABUS	UNIT-6. TEAM BUILDING AND MANAGEMENT				
		6.1	Developing Team Resources, Designing Team	T1, T2, R1	12	Chalk & Talk, PPT Tutorial, Active Learning & Seminars
		6.2	Participation and repercussion , Team Building Activities	T1, T2, R1		
		6.3	Profiles of a few Inspirational Leaders in Business ,Jemshedji	T1, T2, R1		
		6.4	NR Narayana Murthy, LN Mittal Aditya Birla , Karson Bhai Patel IndraNoui	T1, T2, R1		
				Total	64	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Text Books:

1. "The many facets of leadership" Goldsmith,Pearson-2004.
2. "Effective Leadership" , Lussier, Thomson Publication,2007.
3. "A dairy on Leadership", Neil Thomas, Pearson,2004.

Reference Books:

1. "Leadership for Innovation" John Adair, Kogan Page PrivateLtd.
2. "A Handbook of Management and Leadership, Michael Armstrong, Kogan PageLtd.
3. "Leadership Development: Rescuay C Rayon, ElsvierPublishers

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet-522601 Department of MBA

LESSON PLAN-A.Y: 2024-25

PROGRAMME: MBA	
COURSE: (IJLL)INDUSTRIAL JURISPRUDENCE & LABOUR LEGISLATIONS	Semester : **IV** CREDITS: **4**
COURSE CODE: **19MBA4THH4** REGULATION: **R19**	COURSE TYPE (CORE /ELECTIVE / BREADTH/ S&H): **BREADTH**
COURSE AREA/DOMAIN: **MANAGEMENT**	PERIODS: **6** Per Week.

COURSE OUTCOMES: The student is able to

CO1: Examine the basic concepts and importance of employee legislations in India. [K4]
CO2: Apply the concept of industrial disputes Act. [K3]
CO3: Explain the importance of payment of bonus Act. [K2]
CO4: Evaluate the benefits provided by the payment of Gratuity Act to the employees. [K5]
CO5: Analyse the legal formalities under minimum wages Act. [K4]
CO6: Determine the various provisions of the Factories Act. [K5]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Examine the basic concepts and importance of employee legislations in India. [K4]		**UNIT-1** EMPLOYEE LEGISLATIONS			
		1.1	Introduction, Definition, Employee Legislation	T1, T2, R1	07	Chalk & Talk
		1.2	Historical Dimensions of Labor	T1, T2, R1		
		1.3	Employee legislation in India	T1, T2, R1		
		1.4	Industrial Relations in India	T1, T2, R1		
		1.5	Determinants of Industrial relations	T1, T2, R1		
			ASSIGNMENT-I EXAMINATION			
2	CO2: Apply the concept of industrial disputes Act. [K3]		**UNIT-2** THE INDUSTRIAL DISPUTES ACT, 1947			
		2.1	Provisions of Act, Strikes and Lockouts – Lay-Offs and Retrenchment	T1, T2, R2	10	Chalk & Talk, & Case Study
		2.2	Compensation to workmen, Unfair Labour Practices	T1, T2, R1		
		2.3	Penalty for Instigation, Penalty for breach of settlement.	T1, T2, R2		

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		2.4	Penalty for Instigation, Penalty for breach of settlement.	T1, T2, R2		
		UNIT-3. PAYMENT OF BONUS ACT, 1965				
3	CO3: Explain the importance of payment of bonus Act. [K2].	3.1	Concept of Bonus, Nature and Scope	T1, T2, R1	10	Chalk & Talk,
		3.2	Constitutional validity of the act and provisions	T1, T2, R1		
		3.3	Eligibility for bonus	T1, T2, R1		
		3.4	Payment of minimum and maximum bonus	T1, T2, R1		
		3.5	Calculation of bonus with respect to certain employees	T1, T2, R1		
		3.6	Reference of the disputes under the act.	T1, T2, R1		
MID I EXAMINATION DURING EIGHTH WEEK						
		UNIT-4. PAYMENT OF GRATUITY ACT, 1972				
4	CO4: Evaluate the benefits provided by the payment of Gratuity Act to the employees. [K5]	4.1	Historical background of the Act, Provisions of the Act	T1, T2, R2	09	Chalk & Talk,
		4.2	Quantum of Gratuity, Forfeiture of Gratuity, Compulsory Insurance	T1, T2, R2		
		4.3	Compulsory Insurance, Determination of the amount of Gratuity.	T1, T2, R1		
		4.4	Exemption of employer from liability in certain cases, Cognizance of offences.	T1, T2, R1		
		ASSIGNMENT -II EXAMINATION				
		UNIT-5. THE MINIMUM WAGES ACT, 1948				
5	CO5: Analayze the legal formalities under minimum wages Act. [K4]	5.1	Concept of wages, Procedure for fixing and revising minimum wages.	T1, T2, R2	10	Chalk & Talk, Seminars
		5.2	Payment of minimum rates of wages, Fixing hours for a normal working day.	T1, T2, R1		
		5.3	Penalties for certain offences, Exemption of employer in certain cases, cognizance of offences.	T1, T2, R1		
		UNIT-6. THE FACTORIES ACT, 1948				
6		6.1	Objects of the Act, Approval, licensing and registration of factories	T1, T2, R1	10	

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	CO6: Determine the various provisions of the Factories Act. [K5]	6.2	The Inspecting Staff, Health Measures	T1, T2, R1		Chalk & Talk, PPT Tutorial, Active Learning & Seminars
		6.3	Safety Measures, Provisions relating to hazardous propcess	T1, T2, R1		
		6.4	Welfare conditions, Annual leave with wages, penalties and procedure.	T1, T2, R1		
				Total	64,	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:

1. Labour and Industrial Laws, P.K.Padhi, PHI, 2007
2. Industrial Jurisprudence, Dr.EM. Rao, Lexix Nexix publications.

Reference Books:

1. Industrial Relations, Trade Unions and Labour Legislation, Sinha: Pearson,2007
2. Liberalisation and Restructing in India, C.S.Venkataratnam: Response Books, 2003

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

DEPARTMENT OF MBA
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
19MBA4THM1	Service Marketing	IV	MBA	6	1

COURSE OUTCOMES: Students are able to

CO1: Analyse the basic concepts of service marketing. [K4]
CO2: Identify the customer needs and expectations. [K2]
CO3: Develop market segmentation process in services marketing. [K6]
CO4: Assess the pricing strategies of services marketing. [K5]
CO5: Analysing the impact of marketing communication in service promotion. [K4]
CO6: Evaluate the consumer grievance recovery strategies. [K5]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Analyse the basic concepts of service marketing. [K4]		**Unit-1.Introduction To Service Marketing**			
		1.1	Introduction to service marketing	T1, T2, R1	8	Chalk & Talk, PPT
		1.2	Characteristics of services	T1, T2, R1		
		1.3	Nature and Importance of services	T1, T2, R1		
		1.4	Growth of service sector in India	T1,R1		
		1.5	Classification of services	T1, T2, R1		
		1.6	Marketing services Vs Physical services	T1, T2, R1		
		1.7	Service Strategy	T1, T2, R1		
		1.8	Accounting Concepts and conventions (GAAP)	T1, T2, R1		
	ASSIGNMENT-1 EXAMINATION					
2	CO2: Identify the customer needs and expectations. [K2]		**Unit-2. Consumer Behaviour in Services**			
		2.1	Nature of relationship marketing and its service consumption	T1, T2, R1	09	Chalk & Talk, PPT
		2.2	Understanding customer needs and expectations	T1, T2, R1		
		2.3	Creating and maintaining valued relations	T1, T2, R1		
		2.4	Customer loyalty	T1, T2, R1		
	MID I EXAMINATION DURING SIXTH WEEK					
3	CO3: Develop market		**Unit-3Service Market Segmenatations**			
		3.1	Market segmentation process	T1, T2, R1		Chalk &Talk,
		3.2	Selecting the appropriate customer	T1, T2, R1		

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	segmentation process in services marketing. [K6]		portfolio			PPT
		3.3	Value addition to the service product	T1, T2, R1	08	
		3.4	Planning and branding service products	T1, T2, R1		
		3.5	New service development			
4	CO4: Assess the pricing strategies of services marketing. [K5]	**Unit-4. Pricing Strategies for Services**				
		4.1	Nature of service pricing and Service quality Management	T1, T2, R2	10	Chalk & Talk, PPT
		4.2	Establishing monetary pricing objectives	T1, T2, R2		
		4.3	Pricingvsdemand,service pricing strategies into practice.	T1, T2, R2		
		4.4	Service Quality Audit, GAP Model of service quality	T1, T2, R2		
		4.5	Total quality services marketing,service excellence.	T1		
ASSIGNMENT-2 EXAMINATIONS						
5	CO5: Analysing the impactof marketng communication in service promotion. [K4]	**Unit 5. Service Promotion**				
		5.1	The role of marketing communication.	T1, T2, R3	13	Chalk & Talk, PPT
		5.2	Marketing communication mix.	T1, T2, R3		
		5.3	Planning and managing service delivery,creating delivery systems in price and cyberspace	T1, T2, R2		
		5.4	The role of intermediaries.	T1,R2		
6	CO6: Evaluate the consumer grievance recovery strategies. [K5]	**Unit 6.**External Marketing				
		6.1	Introduction to interactive Marketing.	T1, T2, R1	12	Chalk & Talk, PPT
		6.2	Management of Moments of Truth	T1, T2, R1		
		6.3	Service deficiencies, and consumer grievance recovery strategies.	T1, T2, R1		
		6.4	Managing physical evidence andinternal marketing.	T1, T2, R1		
				Total	63	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

TEXT BOOKS:

T1: Services Marketing C.Bhattacharjee, Excel Books, New Delhi,2010

T2: Service Management and Marketing, Christian Gronroos, Wiley India, NewDelhi,2010

REFERENCES:

R1: Services Marketing ,GovindApte:, Oxford University Press, New Delhi,2010

R2: S.L.Gupta, Marketing of Services, WisdomPublication.2003

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DEPARTMENT OF MASTER OF BUSINESS ADMINSTRATION
LESSON PLAN – A.Y.2024-2025

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
19MBA4THM2	DIGITAL MARKETING (R19)	IV	MBA	6	1

COURSE OUTCOMES: The student is able to

CO1: Outline the basic concepts of Digital Marketing. [K2]
CO2: Analyze different channels of digital marketing according to the changing requirements of the markets. [K4]
CO3: Construct different digital marking plans on situational basis.
CO4: Adapt changes through market research for attainment of news goals. [K6]
CO5: Compare different avenues of social media for marketing and advertising products for effective sales. [K4]
CO6: Build the psychological process and develop the effective strategy in terms of impact on consumer behavior. [K6]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Outline the basic concepts of Digital Marketing. [K2]		**UNIT-1** INTRODUCTION TO DIGITAL MARKETING			
		1.1	Concept, Components of Digital Marketing, Need and Scope of Digital Marketing	T1, T2, R1	11	Chalk & Talk, Active Learning & Tutorial
		1.2	Benefits of Digital Marketing, Digital Marketing Platforms and Strategies	T1, T2, R1		
		1.3	Comparison of Marketing and Digital Marketing,	T1, T2, R1		
		1.4	Importance of Audience Segmentation	T1, T2, R1		
		1.5	How different segments use Digital Media	T1, T2, R1		
		1.6	Digital Marketing Trends. Segmentation	T1, T2, R1		
Assignment-1 DURING FOURTH WEEK						
2	CO2: Analyze different channels of digital marketing according to the changing requirements of the markets. [K4]		**UNIT-2** CHANNELS OF DIGITAL MARKETING			
		2.1	Digital Marketing, Website Marketing, Search Engine Marketing	T1, T2, R2	09	Chalk & Talk, Tutorial, Active Learning & Case Study
		2.2	Online Advertising, Email Marketing, Blog Marketing, Social Media Marketing,	T1, T2, R1		
		2.3	Audio, Video and Interactive Marketing, , Online Public Relations	T1, T2, R2		
		2.4	Mobile Marketing, Migrating from Traditional Channels to Digital Channels.	T1, T2, R2		
3			UNIT-3. : DIGITAL MARKETING PLAN			

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	CO3: Construct different digital marking plans on situational basis.	3.1	Need of a Digital Marketing Plan, Elements of a Digital Marketing Plan	T1, T2, R1	14	Chalk & Talk, Tutorial
		3.2	Marketing Plan, Executive Summary, Mission, Situational Analysis, Opportunities and Issues	T1, T2, R1		
		3.3	Goals and Objectives, Marketing Strategy, Action Plan, Budget,	T1, T2, R1		
		3.4	Writing the Marketing Plan and Implementing the Plan. Using Digital Media to Reach,	T1, T2, R1		
		3.5	Acquisition and Retention of new customers,	T1, T2, R1		
		3.6	Digital Media for Customer Loyalty.	T1, T2, R1		
MID I EXAMINATION DURING EIGHTH WEEK						
		UNIT-4. : DIGITAL MARKETING MANAGEMENT				
4	CO4: Adapt changes through market research for attainment of news goals. [K6]	4.1	Role of web marketing manager, Web marketing department structure, Roles and responsibilities, Job description, Targets, goals.	T1, T2, R2	14	Chalk & Talk, & Tutorial,
		4.2	Market research, Value creation process. Strategic web marketing plan, Budgeting, Channel. Online Reputation Management: Brand management	T1, T2, R2		
		4.3	Tools to monitor online brand reputation, Communication online best practices	T1, T2, R1		
		4.4	Online newspaper, magazine ads, Google, Yahoo news.	T1, T2, R1		
Assignment-2 DURING TWELVETH WEEK						
		UNIT-5. SEARCH ENGINE MARKETING AND ONLINE ADVERTISING				
5	CO5: Compare different avenues of social media for marketing and advertising products for effective sales. [K4]	5.1	Importance of SEM, understanding Web Search – keywords, HTML tags, Inbound Links, Online Advertising vs. Traditional Advertising,	T1, T2, R2	11	Chalk & Talk, Tutorial, & Seminars
		5.2	Payment Methods of Online Advertising – CPT [Cost-per-Thousand] and CPC [Cost-per-click],	T1, T2, R1		
		5.3	Display Ads - choosing a Display Ad Format, Landing Page and its importance.	T1, T2, R1		
		UNIT-6. SOCIAL MEDIA MARKETING				
6	CO6: Build the psychological processand develop theeffective strategy in terms of impacton consumer behaviour. [K6]	6.1	Understanding Social Media, Social Networking with Facebook, LinkedIn, Blogging as a social medium, Micro blogging with Twitter	T1, T2, R1	08	Chalk & Talk, Tutorial, & Seminars
		6.2	Social Sharing with YouTube, Social Media for Customer Reach, Acquisition and Retention.	T1, T2, R1		Learning &
		6.3	Measurement of Digital Media:	T1, T2,		

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			Analyzing Digital Media Performance, Analyzing Website Performance,	R1		
		6.4	Analyzing Advertising Performance	T1, T2, R1		
				Total	67	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:

1. Dave Evans., Susan Bratton, [2008]. Social Media Marketing: An Hour a Day. ,2nd edition, Wiley 2. Dave Evans., Susan Bratton, [2010]. Social Media Marketing: The Next Generation of Business Engagement. Wiley
3. Your Google Game Plan for Success: Increasing Your Web Presence with Google AdWords, Analytics and Website Optimizer, Joe Teixeira, Wiley 2010
4. Michael Miller, B2B Digital Marketing, 1e, Pearson, 2014.

Reference Books:

1. Vandana Ahuja, Digital marketing, Oxford University Press 2015.
2. Michael R Solomon, Tracy Tuten, Social Media Marketing, Pearson, 1e, 2015.
3. Judy Strauss & Raymond Frost, E-Marketing, Pearson, 2016.
4. Richard Gay, Alan Charles worth and Rita Esen, Online marketing – A customer led approach Oxford University Press 2007.
5. Arup Varma, Pawan S. Budhwar, Angelo S. De Nisi, Digital Marketing, Wiley, 2016.

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C PROGRAMMING AND DATA STRUCTURES

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20MCA101	C PROGRAMMING AND DATA STRUCTURES (R20)	I	MCA	7	A,B&C

COURSE OUTCOMES:

After completion of the course, the students would be able to:

CO1: Demonstrate basic knowledge of computer hardware and software.
CO2: Ability to problem-solve and apply logic in programming.
CO3: Implement modular programming using functions.
CO4: Interpret dynamic memory allocation using pointers and organize data into files.
CO5: Apply and analyze data structures, searching, sorting, and algorithmic techniques
CO6: Interpret dynamic memory allocation using pointer and organize date into files

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT I			
1	**CO1**: Demonstrate basic knowledge of computer hardware and software.	1	Introduction to Computers, HW/SW concepts, algorithms, pseudocode.	T1	18	Chalk & Talk, PPT, Tutorials
		2	Flowcharts, program development steps, IDE usage, C program structure, identifiers,	T1		
		3	Data types, variables, constants, operators (arithmetic, relational, logical, bitwise),	T1		
		4	Expressions, type conversions, control structures (if, goto, switch).	T1		
			UNIT II			
2	**CO2**: Ability to problem-solve and apply logic in programming.	1	Loops (while, do-while, for),	T1	12	Chalk & Talk, PPT, Lab Practice
		2	Break/continue, arrays (1-D, 2-D, multi-dimensional),	T1		
		3	Character arrays, string manipulations.	T1		
			UNIT III			
3	**CO3**: Implement modular programming using functions.	1	UNIT III: Functions – basics, parameter passing, storage classes, recursive functions, header files,	T1,T2	14	Chalk & Talk, PPT, Lab
		2	preprocessor. Pointers – concepts, initialization, pointer arguments, dangling pointers, pointer to pointer,	T1,T2		
		3	multidimensional pointers, dynamic memory management, command-line arguments.	T1,T2		
			MID I EXAMINATION DURING EIGH			
4			UNIT IV			

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	CO4: Interpret dynamic memory allocation using pointers and organize data into files.	1	Derived types – structures, nested structures, arrays of structures, structures & functions,	T1	14	Chalk & Talk, PPT, Hands-on
		2	self-referential structures, unions, typedef, bit-fields,	T1		
		3	file handling (text & binary), formatted/unformatted I/O.	T1		
5	**CO5**: Apply and analyze data structures, searching, sorting, and algorithmic techniques		**UNIT V**			
		1	Introduction to DS,	T2, T3	10	Chalk & Talk, PPT, Lab Practice
		2	Time/Space Complexity, pattern matching (naive, Rabin-Karp), searching (linear, binary),	T2, T3		
		3	sorting (bubble, selection, insertion, quick, merge).	T2, T3		
			UNIT VI			
6	**CO6:** Interpret dynamic memory allocation using pointer and organize date into files	1	Linked lists (single, double, circular), stacks & queues (array/linked list), infix-to-postfix,	T2, T3	14	Chalk & Talk, PPT, Case Study
		2	Postfix evaluation, trees (binary trees, terminology, representation, traversals),	T2, T3		
		3	Graphs (DFS/BFS, representation), Warshall, Dijkstra, Kruskal, Prim algorithms.	T2, T3		
				TOTAL	**82**	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Textbooks:

1. Computer Science: A Structured Programming Approach Using C – B.A. Forouzan & R.F. Gilberg, Thomson.

Reference Books:

- 1. Fundamentals of Data Structures in C – Horowitz, Sahni, Anderson-Freed.
- 2. Classic Data Structures – Samanta.
- 3. The C Programming Language – Kernighan & Ritchie.
- 4. C Programming with Problem Solving – J.A. Jones & K. Harrow.
- 5. Data Structures Using C – Tanenbaum, Langsam, Augenstein.
- 6. Programming in C – Stephen Kochan.
- 7. Data Structures and Program Design in C – Kruse et al.
- 8. Data Structures and Algorithms – Aho, Hopcroft, Ullman.
- 9. C and Data Structures – Ashok Kamthane.
- 10. C Programming and Data Structures – Balaguruswamy.

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DATABASE MANAGEMENT SYSTEMS

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20MCA103	DATABASE MANAGEMENT SYSTEMS(R20)	I	MCA	7	A, B & C

COURSE OUTCOMES:

After completion of the course, the students would be able to:

CO1 : Interpret the fundamentals of DBMS. [K2]

CO2 : Analyze DB design methodology and normalization process. [K4]

CO3 : Develop Queries in RDBMS. [K3]

CO4 : Compare and Contrast various transaction and concurrency management techniques. [K2]

CO5 : Analyze various file organizations and indexing techniques. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT I			
1	CO1 : Interpret the fundamentals of DBMS. [K2]	1.	Database System Applications, Purpose of Database Systems View of Data, Database Languages, Relational Databases.	T2 R1	20	Chalk & Talk, PPT, Active Learning & Tutorial
		2	Database Design, Data Storage and Querying, Transaction Management, Database Architecture Data Mining and Information Retrieval.	T2		
		3	Specialty Databases, Database Users and Administrators, History of Database Systems Database Design and ER Diagrams Entities Attributes and Entity Sets.	T1 T2		
		4	Relationships and Relationship Sets, Additional Features of the ER Model, Conceptual Design with the ER Model, Extended ER features.	T1		
			UNIT II			
2	CO2 : Analyze DB design methodology and normalization process. [K4]	1	Introduction to the Relational Model, Integrity Constraints over Relations, Enforcing Integrity Constraints, Querying Relational Data..	T1, R1	20	Chalk & Talk, PPT Tutorial, Active Learning
		2	Logical Database Design: ER to Relational, Introduction to Views, Destroying/Altering Tables and Views.	T1, R1		
		3	Selection and Projection, Set Operations, Renaming, Joins, Division, More Examples of	T1, R1		

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			Algebra Queries.			
			Relational Calculus: Tuple Relational Calculus, Domain Relational Calculus.	T1, R1		
			UNIT III			
3	CO3 : Develop Queries in RDBMS. [K3]	1	The Form of a Basic SQL Query, UNION, INTERSECT and EXCEPT, NestedQueries, Aggregate Operators.	T1, R1	10	Chalk & Talk, PPT, Tutorial
		2	Null Values, Complex Integrity Constraints in SQL, Triggers, Exceptions, Procedures Functions.	T1, R1		
		3	**Normal Forms:** Introduction to Schema Refinement, Functional Dependencies, Reasoning about FDs.	T1, R1		
		4	Normal Forms, Properties of Decompositions, Normalization.	T1, R1		
			MID I EXAMINATION DURING EIGHTH WEEK			
			UNIT IV			
4	CO4 : Compare and Contrast various transaction and concurrency management techniques. [K2]	1	**Schema Refinement:** Multivalued dependencies, Fourth Normal form, Join Dependencies, Fifth Normal Form, Lossless join, dependency preservation	T2, R2	7	Chalk & Talk, PPT & Tutorial, , Industrial Visit, Demonstration with models.
		2	**Transaction Management:** Transaction Concepts, Transaction state, Implementation of Atomicity and Durability, Concurrent Execution, Serializability, Recoverability..	T2		
		3	**Concurrency Control**: Lock-based Protocols: Locks, Granting of Locks, Two Phase Locking Protocol, Implementation of locking	T2		
		4.	Timestamp-Based Protocols: Time Stamps, Time Stamp Ordering protocol, Thomas Write Rule, Validation-Based Protocols	T2		
			UNIT V			
5	CO5 : Analyze various file orgnizations and	1.	**Overview of Storage and Indexing:** Data on External Storage, File organization and indexing	T1, R1	6	Chalk & Talk, PPT, Virtual labs, Tutorial, & Project based learning
		2.	Clustered Indexes, Primary and Secondary Indexes; Index Data Structures: Hash and Tree based	T1, R1		

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	indexing techniques. [K4]		indexing: Comparison of File organizations			
		3.	**Tree Structured Indexing**: Intuitions for Tree Indexes, Indexed Sequential Access Method (ISAM),.	T1, R1		
		4.	B+ Trees: A Dynamic Index Structure, Search, Insert, Delete, Duplicates, B+ Trees in Practice.	Total	70	
				Total	70	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Text Books:

1. Database Management Systems, 3/e, Raghurama Krishnan, Johannes Gehrke, McGraw-Hill
2. Database System Concepts, 6/e, Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill
3. DatabaseSystems,9/e, Carlos Coronel, Steven Morris, PeterRob, Cengage

Reference Books:

1. Introduction to Database Systems,8/e, CJ Date, Pearson
2. Database Systems,6/e RamezElmasri, ShamkantB.Navathe, Pearson

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OPERATING SYSTEMS

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20MCA104	OPERATING SYSTEMS (R20)	I	MCA	3	A,B&C

COURSE OUTCOMES:

After completion of the course, the students would be able to:

CO1: Classify different system types and understand system calls.

CO2: Compute waiting and turnaround times for CPU scheduling algorithms.

CO3: Analyze page faults for page replacement algorithms and evaluate deadlock handling methods.

CO4: Differentiate various file system and directory implementations.

CO5: Assess disk scheduling algorithms and compare protection and security mechanisms.

CO6: Identify and explain key concepts in computer security, including the nature of security problems, program threats, and system/network-based threats.

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT I			
1	**CO1**: Classify different system types and understand system calls.	1	OS structures – batch, multiprogrammed, time-shared, real-time,	T1	10	virtual machines, system design and implementation.
		2	distributed systems; OS services, system calls,	T1		
		3	virtual machines, system design and implementation.	T1		
			UNIT II			
2	**CO2**: Compute waiting and turnaround times for CPU scheduling algorithms	1	Process concept, scheduling, operations, IPC,	T1	10	Chalk & Talk, PPT, Tutorial
		2	client-server communication, threads, multithreading models,	T1		
		3	thread libraries, threading issues, UNIX/Linux/Windows case studies.	T1		
			UNIT III			
3	**CO3**: Analyze page faults for page replacement algorithms and evaluate deadlock handling methods.	1	CPU Scheduling – FCFS, SJF, SRTF,	T1	12	Chalk & Talk, PPT, Problem Solving
		2	Priority, RR, Multilevel queue/feedback queue, multiprocessor scheduling.	T1		
		3	Deadlocks – characterization, prevention, avoidance, detection, recovery.	T1		
	MID I EXAMINATION DURING EIGHTH WEEK					
			UNIT IV			
4	**CO4**: Differentiate various file system and directory implementations.	1	Process synchronization – critical section problem,	T1		Chalk & Talk, PPT, Case Study
		2	Peterson's solution, semaphores,	T1		
		3	classic synchronization problems, monitors, examples.	T1		
5			**UNIT V**			

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	CO5: Assess disk scheduling algorithms and compare protection and security mechanisms.	1	Memory management – logical/physical address space, swapping, paging,	T1	12	Chalk & Talk, PPT
		2	segmentation, demand paging, page replacement algorithms,	T1		
		3	thrashing. File system – file concept, access methods, directory structure, protection, allocation methods, free space management.	T1		
			UNIT VI			
6	**CO6:** Identify and explain key concepts in computer security, including the nature of security problems, program threats, and system/network-based threats.	1	Mass storage – disk structure, disk scheduling, RAID, swap space,	T1	10	Chalk & Talk, PPT, Tutorial
		2	stable storage. Protection – access matrix, domain, capability systems.			
		3	Security – program threats, system/network threats, cryptography.			
				TOTAL	**64**	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Textbooks:

- 1. Operating System Concepts, 7th Edition – Silberschatz, Galvin, Gagne.

Reference Books:

- 1. Operating Systems – William Stallings.
- 2. Operating Systems Design and Implementation – Tanenbaum & WoodHull.

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MATHEMATICAL AND STATISTICAL FOUNDATIONS

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20MCA105	MATHEMATICAL AND STATISTICAL FOUNDATIONS (R20)	I	MCA	3	A

COURSE OUTCOMES:

After completion of the course, the students would be able to:

CO1: Demonstrate skills in solving mathematical problems.
CO2: Comprehend mathematical principles and logic.
CO3: Formulate and test statistical hypotheses using sample data.
CO4:Apply queuing and statistical models to identify optimal service rates.
CO5: Apply tests for the difference between two population proportions and draw valid statistical inferences based on Z-test results.
CO6: Apply chi-square tests for goodness of fit and test of independence, including computation of expected frequencies and interpretation of chi-square results.

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT I			
1	**CO1**: Demonstrate skills in solving mathematical problems.	1	Mathematical Logic – statements, connectives, WFFs, truth tables,	T1	12	Chalk & Talk, PPT
		2	equivalence, normal forms, inference rules, indirect proof, theorem proving.	T1		
		3	Predicate calculus – predicates, quantifiers,	T1		
		4	free/bound variables, inference theory.	T1		
			UNIT II			
2	**CO2**: Comprehend mathematical principles and logic..	1	Recurrence relations, generating functions, coefficient calculation,	T1	10	Chalk & Talk, PPT, Tutorial
		2	solving recurrence relations,	T1		
		3	characteristic roots, inhomogeneous recurrence relations.	T1		
			UNIT III			
3	**CO3**: Formulate and test statistical hypotheses using sample data.	1	Graph theory – representation, spanning trees, BFS, DFS.	T1	12	Chalk & Talk, PPT
		2	Prim's, Kruskal's, binary trees, planar graphs.	T1		
		3	isomorphism, Euler circuits, Hamiltonian graphs, chromatic number.	T1		
			MID I EXAMINATION DURING EIGHTH WEEK			
			UNIT IV			
4		1	Sampling theory – population samples,		10	Chalk & Talk, PPT,

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	CO4: Apply queuing and statistical models to identify optimal service rates.	2	sampling distributions (mean, variance), central limit theorem,	T2		Problem Solving
		3	point/interval estimation, maximum error estimate.	T2		
5	**CO5**: Apply tests for the difference between two population proportions and draw valid statistical inferences based on Z-test results.		**UNIT V**			
		1	Hypothesis testing (large samples) – null/alternate hypothesis,	T2	10	Chalk & Talk, PPT, Case Study
		2	critical region, significance level, tests for mean, two means,	T2		
		3	proportion, two proportions.	T2		
			UNIT VI			
6	**CO6:** Apply chi-square tests for goodness of fit and test of independence, including computation of expected frequencies and interpretation of chi-square results.	1	Hypothesis testing (small samples) – t-test (single mean, two means, paired),	T2	12	Chalk & Talk, PPT, Lab Practice
		2	F-test (variance equality),			
		3	square for goodness of fit & independence, ANOVA one-way & two-way.			
				TOTAL	**66**	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Textbooks:

- 1. Discrete Mathematical Structures with Applications to Computer Science – J.P. Tremblay, R. Manohar.
- 2. Probability and Statistics – T.K.V. Iyenger et al., S. Chand.

Reference Books:

- 1. Discrete Mathematics – J.K. Sharma.
- 2. Probability and Statistics for Engineers – Miller & Freund.
- 3. Discrete Mathematics for Computer Science – Bogart, Stein, Drysdale.
- 4. Discrete Mathematics and its Applications – Rosen.
- 5. Discrete Mathematics for Computer Science – Haggard, Schlipf, Whitesides.

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HUMAN RESOURCE MANAGEMENT

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20MCA308	HUMAN RESOURCE MANAGEMENT (R20)	III	MCA	3	A,B&C

COURSE OUTCOMES:

After completion of the course, the students would be able to:

CO1: Outline the functions and challenges of HRM. [K4]

CO2: Apply HR Planning, Recruitment, Selection, Training and Executive Development Programs. [K3]

CO3: Apply Job Analysis, Job Description, Job Specification, Ergonomics and Job Evaluation. [K3]

CO4: Utilize various methods of Performance Appraisal. [K3]

CO5: Develop global compensation mechanisms and incentive plans. [K6]

CO6: Examine Trade Unions, Grievance Handling, Industrial Disputes and Stress Management. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT I			
1	**CO1**: Outline the functions and challenges of HRM. [K4]	1	Introduction to HRM – Definition,	T1, T2	10	Chalk & Talk, PPT
		2	Nature & Scope, Functions,	T1, T2		
		3	Role & Position of HRM, PM vs HRM, Challenges of HRM.	T1, T2		
			UNIT II			
2	**CO2**: Apply HR Planning, Recruitment, Selection, Training and Executive Development Programs. [K3]	1	Operative Functions – HR Planning Process, Recruitment (Internal/External),	T1, T2	12	Chalk & Talk, PPT, Case Study
		2	Selection Procedure, Selection Tests, Interview Techniques,	T1, T2		
		3	Training (On/Off Job), Executive Development Programs.	T1, T2		
			UNIT III			
3	**CO3**: Apply Job Analysis, Job Description, Job Specification, Ergonomics and Job Evaluation. [K3]	1	Job Analysis – Job Description, Job Specification, Job Enrichment,	T1	10	Chalk & Talk, PPT
		2	Job Sharing, Telecommuting, Ergonomics,			
		3	, Job Design, Job Evaluation.			
	MID I EXAMINATION DURING EIGHTH WEEK					
			UNIT IV			
4	**CO4**: Utilize various methods of Performance Appraisal. [K3]	1	Performance Appraisal – Traditional & Modern Methods,	T1, T2	10	Chalk & Talk, PPT, Tutorial
		2	Latest Trends, Compensation Concepts,	T1, T2		
		3	Current Trends, Methods of Payment.	T1, T2		
			UNIT V			
5	**CO5**: Develop global compensation	1	Wage & Salary Administration – Wage Structure,	T1, T2	10	Chalk & Talk, PPT

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	mechanisms and incentive plans. [K6]	2	Legal Framework, Wage Determination, Incentive Systems,	T1, T2		
		3	Statutory & Non-Statutory Welfare Measures.	T1, T2		
		UNIT VI				
6	**CO6:** Examine Trade Unions, Grievance Handling, Industrial Disputes and Stress Management. [K4]	1	Industrial Relations – Trade Unions, Grievance Handling,	T1, T2	12	Chalk & Talk, PPT, Case Study
		2	Collective Bargaining, Industrial Dispute Resolution,	T1, T2		
		3	Industrial Safety, Stress Management.	T1, T2		
			TOTAL		**64**	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Textbooks:

- 1. K. Aswathappa – Human Resource & Personnel Management, Tata McGraw Hill.
- 2. Subba Rao P – Personnel and Human Resource Management, Himalaya Publications.

Reference Books:

- 1. N. Sambasiva Rao & Nirmal Kumar – HRM & Industrial Relations.
- 2. Mathis, Jackson, Tripathy – HRM: South Asian Perspective.
- 3. Madhurima Lall, Sakina Qasim – HRM, Excel Books.
- 4. Muller-Camen, Croucher, Leigh – HRM Case Study Approach.
- 5. Seetharaman & Prasad – HRM, Scitech Publications.
- 6. Gary Dessler – HRM, Pearson.
- 7. Uday Kumar Haldar – HR Development, OUP.
- 8. Narendar Singh – HRM, Universities Press.
- 9. B.B. Mahapatro – HRM, New Age International.
- 10. R.S. Dwivedi – Human Relations & OB, MacMillan.

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NARASARAOPET - 522 601, Palnadu (Dist.), A.P.

NEC	Narasaraopeta Engineering College (Autonomous) Yallamanda(Post), Narasaraopet- 522601

DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS
COMPUTER NETWORKS
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R24MCA1201	COMPUTER NETWORKS(R24)	II	MCA	6	A&B

COURSE OUTCOMES:

After successful completion of this course, the students will be able to:

CO 1: Summarize basic concepts of Data Communication and Networking. [K2]
CO 2: Compare and Contrast OSI and TCP/IP reference models. [K2]
CO 3: Interpret data link layer services and multiple access protocols. [K2]
CO 4: Analyze different routing protocols. [K4]
CO 5: Illustrate the essential principles of different transport layer protocols. [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Summarize basic concepts of Data Communication and Networking.		**UNIT-1 Introduction**			
		1.1	OSI Overview TCP/IP and Other Network Models,	T1	4	Chalk & Talk, Active Learning & Tutorial
		1.2	Examples of Networks: Novell Networks, Arpanet, Internet,	T1	3	
		1.3	Network Topologies: WAN, LAN, MAN.	T1	3	
		1.4	**Physical Layer:** Introduction to physical layer, Data and Signals, Periodic analog signals, digital signals, transmission impairment, Data rate limits, performance	T1	2	Chalk & Talk, Active Learning & Tutorial
		1.5	Introduction to Guided Media, Twisted-pair cable, Coaxial cable and Fiber optic cable and Unguided media: Wireless-Radio waves, microwaves, infrared.	T1	2	Chalk & Talk, Active Learning & Tutorial
2	CO2: Compare and Contrast OSI and TCP/IP reference models.		**UNIT-2. Data Link Layer**			
		2.1	Design Issues- Framing, Services Provided to Network Layer.	T1	3	Chalk & Talk, PPT Case Study
		2.2	Flow Control, Error Control, Error Detection and Correction-CRC,	T1	3	
		2.3	Simplex Protocol, Simplex Stop and Wait, Simplex Protocol for Noisy Channel.	T1	2	
		2.4	**Sliding Window Protocol:** One Bit, Go Back N,		3	

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			Protocol for Noisy Channel.			
		2.4	**Sliding WindowProtocol:** One Bit, Go Back N, Selective Repeat-Stop and Wait Protocol,	T1, R1	3	
3	CO3: Interpret data link layer services and multiple access protocols		**UNIT-3. The Medium Access Control Sublayer**			
		3.1	**Medium Access Control Sub Layer:** Chanel Allocation Problem, ALOHA,	T1, R2	4	Chalk & Talk, Tutorial
		3.2	Carrier Sense Multiple Access (CSMA), CSMA With Collision Detection, CSMA with Collision Avoidance,	T1, R2	3	
			MID I EXAMINATION			
		3.4	**Wirelsee LAN Protocols:** Ethernet, Classic Ethernet Physical Layer, Classic Ethernet MAC Sublayer Protocol, Ethernet Performance,	T1, R2	3	Chalk & Talk, & Tutorial, , , Demonstration with models.
		3.5	ast Ethernet, Wireless LANs, The 802.11 Architecture and Protocol Stack, 802.11 Physical Layer, 802.11 MAC Sublayer Protocol, 805.11 Frame Structure, Services.	T1, R2	4	
4	CO 4: Analyze different routing protocols.		**UNIT 4. Network Layer**			
		4.1	**Network Layer:** Network Layer Design Issues- Store and Forward Packet Switching.	T1, R1	2	Chalk &Talk, Tutorial, & Project based learning
		4.2	Service Provided to Transport Layer,	T1, T2	2	
		4.3	Connection Oriented and Connection Less Service, Comparison of Virtual Circuit and Datagram Subnets.	T1, R1	3	
		4.4	**Routing Algorithms:** Optimality Principle, Shortest Path Routing, Flooding,	T1, R1	3	
		4.5	Hierarchical Routing, Broad Cast, Multi Cast,	T1, R1	2	
		4.6	Distance Vector Routing, Link State Routing.	T1, R1	2	
		4.7	Network Layer in Internet: IP Protocol, IP Address, IPv4 frame format.	T1, R1	2	

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5	CO5: Illustrate the essential principles of different transport layer protocols.	Unit-5. Transport Layer				
		5.1	**Transport Layer:** The Transport Services- Services Provided to the Upper Layer, Transport Service Primitives, Elements of Transport Protocol-Addressing, Connection Establishment, Connection Release.	T1, R1	3	Chalk & Talk, PPT Tutorial, Active Learning & Seminars
		5.2	**The Internet Transport Protocols**: TCP and UDP.	T1, R1	3	
		5.3	**Application Layer: DNS**(Domain Naming System)-DNS Namespace, Name Servers,	T1, R2	3	Chalk & Talk, PPT Tutorial, Active Learning & Seminars
		5.4	Electronic Mail-Architecture and Services, Message Format-MIME, Sending and Receiving E-mail, Message Transfer-SMTP.	T1, R2	3	
		5.5	**The World Wide Web-** Architecture Overview, URL, HTTP.	T1, R2	3	Chalk and Talk
				Total no of classes	70	
MID II EXAMINATION						
END EXAMINATIONS						

Text Books:

T1: Andrew S Tanenbaum, "Computer Networks, Pearson Education/PHI, 4th Edition.

T2: Behrouz A.Forouzan, "Data Communications and Networks", TMH, Third Edition,

Reference Books:

R1 COMPUTER NETWORKS – S.Keshav, "An Engineering Approach to Computer Networks", Pearson Education 2nd Edition,

R2 COMPUTER NETWORKS – W.A. Shay, Thomson, "Understanding Communications and Networks", 3rd Edition.

Web Resources:

1. https://onlinecourses.swayam2.ac.in/cec23_cs07/preview
2. https://onlinecourses.nptel.ac.in/noc21_cs18/preview
3. https://ocw.mit.edu/courses/6-829-computer-networks-fall- 2002/pages/lecture-notes/
4. https://www.sanfoundry.com/computer-network-basics/

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NETWORK SECURITY & CYBER SECURITY

LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R24MCA202	NETWORK SECURITY & CYBER SECURITY	II	MCA	5	A,B

COURSE OUTCOMES: Students are able to
CO1: Summarize the fundamentals of Cryptography. [K2]
CO2: Analyze how security is achieved, and attacks can be countered by using asymmetric algorithms. [K4]
CO3: Interpret the role of hash functions and Digital Signatures in Information Security. [K2]
CO4: Interpret Cyber Security architecture principles. [K2]
CO5: Identifying different classes of attacks. [K3]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Summarize the fundamentals of Cryptography. [K2]		**UNIT I:** Basic Principles			
		1.1	Security Goals	T1,R1	1	Chalk & Talk
		1.2	Cryptographic Attacks	T1,R1	1	Chalk & Talk
		1.3	Security Services and Mechanisms	T1 ,R1	1	Chalk & Talk
		1.4	Mathematics of Cryptography Symmetric Encryption	T1 ,R1	1	Chalk & Talk
		1.5	Mathematics of Symmetric Key Cryptography	T1,R1	2	Chalk & Talk
		1.6	Introduction to Modern Symmetric Key Ciphers	T1,R1	1	Chalk & Talk
		1.7	Data Encryption Standard	T1,R1	2	Chalk & Talk, PPT
		1.8	Advanced Encryption Standard	T1,R1	2	Chalk & Talk, PPT
2	CO2: Analyze how security is achieved, and attacks can be countered by using asymmetric algorithms. [K4]		**UNIT II :** Asymmetric Encryption			
		2.1	Mathematics of Asymmetric Key Cryptography-Primes	T1,R1	2	Chalk & Talk, PPT
		2.2	Primality Testing, Factorization	T1,R1	2	Chalk & Talk, PPT

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		2.3	Asymmetric Key Cryptography-RSA Cryptosystem, Rabin Cryptosystem	T1,R1 T1,R1	3	Chalk & Talk
		2.4	ElGamal Cryptosystem, Elliptic Curve Cryptosystem	T1,R1	3	Chalk & Talk
			Cryptographic Hash Functions:			
		2.5	Applications of Cryptographic Hash Functions, Two Simple Hash Functions Requirements	T1,R1	3	Chalk & Talk
		2.6	Security Hash Functions Based on Cipher Block Chaining,	T1,R1	2	Chalk & Talk
		2.7	Secure Hash Algorithm (SHA), SHA-3	T1,R1	3	Chalk & Talk
			UNIT III : DIGITAL SIGNATURES			
3	CO3: Interpret the role of hash functions and Digital Signatures in Information Security. [K2]	3.1	Elgamal Digital Signature Scheme, Schnorr Digital Signature, NIST Digital Signature Algorithm	T1, R1	4	Chalk & Talk, PPT
			Electronic Mail Security			
		3.2	Internet Mail Architecture, Email Formats, Email Threats and Comprehensive Email Security, ,	T1, R1	2	Chalk & Talk
			MID I EXAMINATION DURING EIGHTH WEEK			
		3.3	S/MIME, IP Security, IP Security Policy	T1, R1	3	Chalk & Talk, PPT
		3.4	Encapsulating Security Payload	T1, R1	2	Chalk & Talk, PPT
		3.5	Combining Security Associations Internet Key Exchange	T1, R2	2	Chalk & Talk, PPT
			UNIT IV : Introduction to Cybercrime			
4	CO4: Interpret Cyber Security architecture principles. [K2]	4.1	Introduction, Cybercrime: Definition and Origins of the Word, Cybercrime and Information Security	T2,R2,W3	3	Chalk & Talk, PPT
		4.2	Cybercriminals, Classifications of Cybercrime	T2,W3	2	Chalk & Talk, PPT
		4.3	Cyber stalking, Cyber cafe and Cybercrimes	T2,R2,W3	2	Chalk & Talk, PPT
		4.4	Botnets, Attack Vector, Proliferation of Mobile and Wireless Devices	T2,R2	3	Chalk & Talk, PPT

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		4.5	Security Challenges Posed by Mobile Devices, Attacks on Mobile/Cell Phones	T2,R2	3	Chalk & Talk, PPT
5	CO5: Identifying different classes of attacks. [K3]	UNIT V : Classes of attacks				
		5.1	Proxy Servers and Anonymizers, Phishing, Password Cracking, Keyloggers and Spywares, Steganography, Sniffers, Spoofing, Session Hijacking Buffer overflow	T2, R1	4	Chalk & Talk, PPT
		5.2	Virus and Worms, Trojan Horses and Backdoors Steganography, Sniffers, Spoofing, Session Hijacking Buffer overflow	T2, R1	3	Chalk & Talk, PPT
		5.3	DoS and DDoS Attacks, SQL Injection, Buffer Overflow, Attacks on Wireless Networks	T2, R1	3	Chalk & Talk
		5.4	Identify theft, FootPrinting and Social Engineering, Port Scanning	T2, R1	2	Chalk & Talk
		5.5	Email Investigation,E-Mail Tracking, IPTracking,Tracking,Email Recovery, Password Cracking.	T2,R1	3	Chalk & Talk
				Total	70	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Text Books:

1. Cryptography and Network Security, 3rd Edition Behrouz A Forouzan, Deb deep Mukhopadhyay, McGraw Hill,2015

2. Sunit Belapure Nina Godbole "Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", WILEY, 2011.

Reference Books:

1. Network Security and Cryptography, First Edition, Bernard Menezes, Cengage Learning, 2018
2. Cryptography and Network Security, William Stallings, Global Edition, 7e Pearson, 2017

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Web Resources:

1. https://archive.nptel.ac.in/courses/106/105/106105162/
2. https://ebooks.inflibnet.ac.in/csp11/chapter/introduction-to-networksecurity/
3. https://www.fortinet.com/resources/cyberglossary/what-iscryptography
4. https://ischoolonline.berkeley.edu/cybersecurity/curriculum/cryptograp hy/
5. https://www.mitel.com/articles/web-communication-cryptographyand-network-security
6. https://www.nist.gov/cybersecurity
7. https://www.codecademy.com/learn/introduction-to-cybersecurity

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DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS
OBJECT ORIENTED PROGRAMMING USING JAVA
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R24MCA1203	OBJECT ORIENTED PROGRAMMING USING JAVA(R24)	II	MCA	6	A&B

COURSE OUTCOMES: Students are able to

CO1: Interpret the syntax and semantics of java programming language and OOPs concepts [K2]
CO2: Make use of different predefines classes and packages to develop programmes using OOPs concepts[K3].
CO3: Apply Exception handling and multithreading on java programs [K3]
CO4: Develop java Programmes using collection frame work & I/O [K3]
CO5: Make use of Applets, AWT and event handling to develop GUI [K3]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Interpret the syntax and semantics of java programming language and OOPs concepts [K2] 1		**UNIT I: Basics of Object Oriented Programming (OOP)**			
		1.1	Need for OO paradigm, A way of viewing world- Agents, responsibility	T1,R1	1	Chalk & Talk
		1.2	messages, methods, classes and instances	T1,R1	1	Chalk & Talk
		1.3	Class hierarchies (Inheritance), method binding, overriding and exceptions	T1 ,R1	2	Chalk & Talk
		1.4	summary of OOP concepts, coping with complexity, abstraction mechanisms.	T1 ,R1	1	Chalk & Talk
		1.5	Java Basics: Data types,	T1,R1	1	Chalk & Talk
		1.6	variables, scope and life time of variables, arrays.	T1,R1	1	Chalk & Talk
		1.7	operators, expressions	T1,R1	2	Chalk & Talk
		1.9	Control statements	T1,R1	2	Chalk & Talk
		1.10	type conversion and costing, simple java program, classes and objects- concepts of classes.	T1,R1	2	Chalk & Talk
		1.11	objects, constructors methods, access control, this keyword	T1,R1	2	Chalk & Talk
		1.12	garbage collection, overloading methods	T1,R1	2	Chalk & Talk
		1.13	constructors, parameter recursion, string handling	T1,R1	2	Chalk & Talk
2	CO2: Make use of different predefines classes and packages to develop programmes using OOPs concepts[K3]. 1		**UNIT II : Inheritance**, Packages and Interfaces			
		2.1	Hierarchical abstractions, Base class object, subclass, Passing subtype,substitutability.	T1,R1	2	Chalk & Talk
		2.2	forms of inheritance- specialization, specification,	T1, R2	2	Chalk & Talk, PPT

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			construction			
		2.3	limitation, combination, benefits of inheritance costs of inheritance	T1, R2	2	Chalk & Talk,
		2.4	Member access rules, super uses, using final with inheritance, polymorphism, abstract classes	T1,R1	2	Chalk & Talk
		2.5	Defining, Creating and Accessing a package,Understanding CLASSPATH, Importing packages, differences between classes and interfaces,	T1,R2 ,R3	2	Chalk & Talk
		2.6	defining an interface, Implementing interface, applying interfaces variables in interface and extending interfaces.	T1,R1	3	Chalk & Talk
3	CO3: Apply Exception handling and multithreading on java programs [K3]		**UNIT III : Exception handling and Multithreading**			
		3.1	Concepts of exception handling, benefits of exception handling, Termination or resumptive models	T1, R1	2	Chalk & Talk
		3.2	Exception hierarchy, usage of try, catch, throws and finally, built in exceptions	T1, R1	2	Chalk & Talk, PPT
		3.3	Creating own exception subclasses, Differences between multithreading and multitasking	T1, R1,R3	2	Chalk & Talk, PPT
			MID I EXAMINATION DURING EIGHTH WEEK			
		3.4	Thread lifecycle, creating threads	T1, R2	2	Chalk & Talk, PPT
		3.5	synchronizing threads	T1, R2	1	Chalk & Talk, PPT
		3.6	daemon threads, thread groups	T1, R2	2	Chalk & Talk, PPT
4	CO4: Develop java Programmes using collection frame work & I/O [K3]		**UNIT IV : Event Handling**			
		4.1	Events, Event sources, Event classes	T1,R2	2	Chalk & Talk, PPT
		4.2	Event Listeners, Delegation event model	T1,R3	2	Chalk & Talk, PPT
		4.3	handling mouse and keyboard events	T1,R2 ,R3	2	Chalk & Talk, PPT
		4.4	Adapter classes, inner classes. The AWT class hierarchy	T1,R2	2	Chalk & Talk, PPT

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		4.5	user-interface components- labels, button, canvas, scrollbars, text components, check box, checkbox groups, choices	T1,R2	2	Chalk & Talk, PPT
5	CO5: Make use of Applets, AWT and event handling to develop GUI [K3]	**UNIT V : Swings**				
		5.1	Introduction, limitations of AWT	T1, R1	2	Chalk & Talk, PPT
		5.2	MVC architecture, components	T1, R1	2	Chalk & Talk, PPT
		5.3	containers, exploring swing- JFrame and JComponent	T1, R1	3	Chalk & Talk, PPT
		5.4	Icons and Labels, text fields,	T1, R2	2	Chalk & Talk, PPT
		5.5	buttons-The JButton class, Check boxes, Radio Buttons	T1, R2	2	Chalk & Talk, PPT
		5.6	ComboTabbed panes, Scroll panes, Trees and Tables. Boxes.	T1, R2	2	Chalk & Talk, PPT
				Total	70	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1: Java-The Complete Reference,7/e, Herbert schildt, TMH

Reference Books:

R1: JAVA: How to program,8/e, Dietal, Dietal. PHI.
R2: Introduction of programming with JAVA, S.Dean, TMH
R3: Introduction to JAVA programming, 6/e, Y.Daniel Liang, Pearson
R4: Core Java2, Vol1(Vol2) Fundamentals (Advanced),7/e, Cay.S.Horstmann, Gary Cornell, Pearson
R5: Big Java 2,3/e, Cay.S.Horstmann,Wiley
R6:Object Oriented Programming through Java, P.Radha Krishna, University Press

Web resources:

1. https://onlinecourses.nptel.ac.in/noc20_cs58/preview
2. https://www.iitk.ac.in/esc101/05Aug/tutorial/information/resources.html
3. https://docs.oracle.com/javase/tutorial/index.html
4. https://www.javacodegeeks.com/best-java-programming-resources

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SOFTWARE ENGINEERING

LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R24MCA1204	SOFTWARE ENGINEERING(R24)	I	MCA	5	A,B

COURSE OUTCOMES: Students are able to

CO 1: Analyze Software Life Cycle models. [K4]

CO 2: Analyze the importance of software requirement and project management [K4]

CO 3: Analyze various types of software design techniques [K4]

CO 4: Analyze Software testing and quality management [K4].

CO 5: Analyze various CASE tools and software maintenance process models. [K4]

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
1	CO1: Analyze Software Life Cycle models. [K4]	UNIT I: Introduction				
		1.1	**Introduction to Software Engineering Concept:**	T1,R1,R3	2	Chalk & Talk
		1.2	Software Engineering and its history, Software crisis, Evolving of a Programming System Product, Characteristics of Software, Brooks' No Silver Bullet and Software Myths. Software Process, Code-and-Fix model,	T1 ,R1	2	Chalk & Talk
		1.3	Development Life Cycles : Software Development Waterfall model, Evolutionary Model, Incremental Implementation, Prototyping, Spiral Model, Software Reuse, Critical Comparisons of SDLC models	T1 ,R1	2	Chalk & Talk
		1.4	An Introduction to Non-Traditional Software Development Process: Rational Unified Process, Rapid Application Development, Agile Development Process-Introduction, Agile- SCRUM(Sprint, Review, Retrospective, Planning) , XP, KANBAN, SAFE agile	T1,R1	2	Chalk & Talk
2	CO 2: Analyze the importance of software requirement and project management [K4]	UNIT II : Classes of User Requirements				
		2.1	Requirements: Importance of Requirement Analysis, User needs, Software Features and Software Requirements.	T1,R1	4	Chalk & Talk
		2.2	Enduring and Volatile, Sub phases of Requirement Analysis, Functional and Non-functional requirements, Barriers to Eliciting User requirements	T1,R1	2	Chalk & Talk

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		2.3	The software requirements document and SRS standards, Requirements Engineering, Case Study of SRS for a Real Time System.	T1,R2,R3	2	Chalk & Talk
		2.4	Tools for Requirements Gathering: Document Flow Chart, Decision Table, Decision Tree, Introduction to non-traditional Requirements.	T1,R1	3	Chalk & Talk
			UNIT III : Software Design			
3	CO3: CO 3: Analyze various types of software design techniques [K4]	3.1	Software Design: Goals of good software design, Design strategies and methodologies, Data oriented software design. Structured Design: Structure chart, Coupling, Cohesion, Modular structure, Packaging, Object oriented design, Top-down and bottom-up approach, Design patterns.	T1, R1	2	Chalk & Talk
		3.2	Structured Analysis: DFD, Data Dictionary, Software Measurement and Metrics: Various Size Oriented Measures:	T1, R1	3	Chalk & Talk, PPT
			MID I EXAMINATION DURING EIGHTH WEEK			
			Halstead's software science, Function Point (FP) based measures,			
		3.3	Cyclomatic Complexity Measures: Control flow graphs Development: Selecting a language, Coding guidelines, Writing code, Code documentation.	T1, R1,R3	2	Chalk & Talk, PPT
4	CO 4: Analyze Software testing and quality management [K4].		**UNIT IV : Software Testing**			
		4.1	Software Testing :Testing process, Design of test cases, Functional Testing : Boundary value analysis, Equivalence class testing,	T1,R2	2	Chalk & Talk, PPT
		4.2	Decision table testing, Cause effect graphing, Structural testing, Path testing, Data flow and mutation testing	T1,R3	2	Chalk & Talk, PPT
		4.3	Unit testing, Integration and system testing, Debugging	T1,R2,R3	2	Chalk & Talk, PPT
		4.4	Alpha & beta testing.	T1,R2	2	Chalk & Talk, PPT
		4.5	testing tools & standards.	T1,R2	2	Chalk & Talk, PPT
5	CO 5: Analyze various		**UNIT V : Software Maintenance:**			

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	CASE tools and software maintenance process models. [K4]	5.1	Software Maintenance: Management of maintenance, Maintenance process, Maintenance	T1, R1	2	Chalk & Talk, PPT
		5.2	models, Regression testing, Reverse engineering, Software reengineering	T1, R1	2	Chalk & Talk, PPT
		5.3	Configuration managemen	T1, R1	2	Chalk & Talk, PPT
		5.4	Software documentation.	T1, R2	2	Chalk & Talk, PPT
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1: Tc Graw Hill, 9th 1. Software Engineering: A Practitioner's Approach, R. S. Pressman, Edition, Sept 2019

Reference Books:

1. Software Engineering K.K.Aggarwal, Yogesh Singh, New Age International Publishers, Third Edition, 2007
2. Software Engineering, Ian Sommerville, Addison Welsley, 9th 2010
3. An Integrated Approach to Software Engineering, PankajJalote, Publishing House, 3rdEdition, 2007 Edition, Naroda

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DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS
LESSON PLAN

Subject Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R24MCA1205	ARTIFICIAL INTELLIGENCE	2	MCA	6	A&B

After completion of this course the student should be able to

CO	Course Outcome Statement
CO1	Analyse and Design InteIntelligent Agents[K4]
CO2	Apply Search Algorithms to Problem Solving[K3]
CO3	Apply techniques for constraint propagation and reasoning under uncertainty[K3]
CO4	Utilize inductive learning , decion trees and explanation based learning for learning from observation[K3]
CO5	Analyse and compare typical expert systems such as MYCIN,DART, and XCON[K4]

Unit No	Outcome	Topics/Activity		Ref Text book	Total Periods	Delivery Method
		Unit-1. Introduction				
	CO 1: Analyse and Design InteIntelligent Agents[K4]	1.1	Introduction:AI Definition, AI problem, AI System	T1, T2 &T3	2	Chalk & Talk
		1.2	Components of AI Program	T1, T2	2	Chalk & Talk
		1.3	Foundations of AI	T1, T2	2	Chalk, Talk& PPT
		1.4	Applications of AI	T1, T2	2	Chalk & Talk
		1.5	Current trends in AI	T1, T2	1	Chalk & Talk
		1.6	Intelligent Agents: Anatomy, structure, Types	T1, T2	2	Chalk, Talk& PPT
2	**CO2**: Apply Search Algorithms to Problem Solving[K3]	**Unit-2. Problem Solving**				
		2.1	Problem Solving Agent,	T1, T2,	2	Chalk & Talk
		2.2	Formulating Problems	T1, T2	1	Chalk & Talk
		2.3	Uninformed Search Methods: Breadth First Search (BFS),	T1, T2	2	Chalk & Talk, PPT
		2.4	Depth First Search(DFS)	T1, T2	2	Chalk & Talk
		2.5	Depth First Iterative Deepening (DFID)	T1, T2 &T3	1	Chalk & Talk
		2.6	Informed Search Methods- Greedy best first	T1, T2	2	Chalk, Talk& PPT
		2.7	A* Search, Memory bounded heuristic Search	T1, T2	2	Chalk & Talk
		2.8	Local Search Algorithms and Optimization Problems- Hill	T1, T2	2	Chalk & Talk

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			climbing search Simulated annealing and local beam search.			
3	**CO3**: Apply techniques for constraint propagation and reasoning under uncertainty[K3]	**Unit-3. Knowledge and Reasoning**				
		3.1	Knowledge and Reasoning-Knowledge based Agents	T1, T2	2	Chalk & Talk
		3.2	The Wumpus World, and Propositional logic	T1, T2 &T3	2	PPT
		3.3	First Order Logic –Syntax and Semantic, Inference in FOL	T1, T2	2	Chalk & Talk
		3.4	Forward chaining	T1, T2	1	Chalk & Talk
		MID -1 EXAMINATIONS				
		3.5	backward Chaining		1	Chalk & Talk
		3.6	Knowledge Engineering in First-Order Logic	T1, T2	2	Chalk & Talk
		3.7	Unification	T1, T2	2	Chalk, Talk& PPT
		3.8	Resolution	T1, T2	2	Chalk & Talk
4	**CO4**: Utilize inductive learning , decision trees and explanation based learning for learning from observation[K3]	**Unit 4 : Logic concepts**				
		4.1	Agents: Definition of agents, Agent architectures (e.g., reactive, layered, cognitive)	T1, T2	2	Chalk & Talk
		4.2	Multi-agent systems collaborating agents	T1, T2 &T3	2	Chalk, Talk& PPT
		4.3	Competitive agents		2	Chalk & Talk
		4.4	Swarm systems and biologically Inspired models.	T1, T2	2	Chalk & Talk
		4.5	Expert Systems: Representing and Using Domain Knowledge	T1, T2	2	Chalk, Talk& PPT
		4.6	Expert System Shells		1	Chalk & Talk
		4.7	Explanation, Knowledge Acquisition.	T1, T2	2	Chalk & Talk
5	**CO5**: Analyse and compare typical expert systems such as MYCIN, DART, and XCON[K4]	Unit 5. Expert Systems				Chalk & Talk
		5.1	Expert Systems: Architecture of expert systems	T1, T2	2	Chalk & Talk
			Roles of expert systems		1	Chalk & Talk
		5.2	Knowledge Acquisition	T1, T2	2	Chalk & Talk
			Meta knowledge, Heuristics		2	Chalk & Talk
		5.3	Expert systems- MYCIN	T1, T2 &T3	3	Chalk, Talk& PPT
		5.4	DART	T1, T2	3	Chalk, Talk& PPT
		5.5	XCON	T1, T2	3	Chalk & Talk
		5.6	Expert systems shells		2	Chalk & Talk
						TOTAL: 70

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MID II EXAMINATION
END EXAMINATIONS

TEXT BOOKS:

Text Books:

1. Artificial Intelligence, Sarojkaushik, Cengage Learning India, 2011
2. Artificial Intelligence and Machine Learning, Vinod Chandra S.S., Anand Hareendran S
3. Stuart J.Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach" Second Edition, Pearson.

Reference Books:

1. Ivan Bratko "PROLOG Programming for Artificial Intelligence", Pearson Education, Third Edition.
2. Elaine Rich and Kevin Knight "Artificial Intelligence ", Third Edition
3. Han Kamber, "Data Mining Concepts and Techniques", Morgan Kaufmann Publishers
4. G. Luger, W. A. Stubblefield, "Artificial Intelligence", Third Edition, AddisoWesley Longman, 1998

Web Resources:

1. https://onlinecourses.nptel.ac.in/noc22_cs56/preview
2. https://openlearning.mit.edu/news/explore-world-artificial-intelligence-online- courses-mit
3. https://cse.iitk.ac.in/users/cs365/2015/resources.html
4. https://microsoft.github.io/AI-For-Beginners/ 5. https://artint.info/3e/resources/index.html 6. https://web.dev/explore/ai

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DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS
DATA WAREHOUSING AND DATA MINING
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R24MCA1208	DATA WAREHOUSING AND DATA MINING (R24)	II	MCA	5	A,B

CO1: Interpret the data mining terminology and types of data to be mined. [K2]
CO2: Compare and contrast different dominant Data Mining Algorithms for Classification and apply them.. [K4]
CO3: Analyze the performance of Association Rules. [K4]
CO4: Compare and contrast different dominant Data Mining Algorithms for Clustering and apply them. [K4]
CO5: Interpret web data miming concepts and operations. [K2]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	CO1: Interpret the data mining terminology and types of data to be mined. [K2]	1.1	UNIT I: Introduction to Data Mining	T1, R1	2	Chalk & Talk
		1.2	Data Quality	T2, R1	2	Chalk & Talk
		1.3	Measures of Similarity and Dissimilarity	T1, R1	2	Chalk & Talk
		1.4	Data Warehouse	T3, R1	1	Chalk & Talk
		1.5	OLAP and Multidimensional Data Analysis	T1, R1	2	Chalk ,Talk &PPT
2	CO2: Compare and contrast different dominant Data Mining Algorithms for Classification and apply them. [K4]	2.1	UNIT II: Classification	T3, R1	2	Chalk & Talk
		2.2	Decision Trees	T2, R1	2	Chalk & Talk
		2.3	Nearest Neighbour Classifier	T1, R1	2	Chalk & Talk
		2.4	Model Over fitting	T1, R1	1	Chalk & Talk
		2.5	Support Vector Machines (SVM)	T1, R1	2	Chalk ,Talk &PPT
		2.6	Linear SVM	T3, R1	2	Chalk & Talk
		2.7	Separable and Non-Separable Case	T1,		Chalk &

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Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
3	**CO3:** Analyze the performance of Association Rules. [K4]	3.1	**UNIT III:** Association Analysis	T3, R1	2	Chalk & Talk
		3.2	Problem definition	T3, R1	2	Chalk & Talk
		3.3	Frequent item-set generation	T3, R1	2	Chalk & Talk
		3.4	Rule Generation	T3, R1	2	Chalk & Talk
		3.5	Handling Categorical and Continuous Attributes	T3, R1	3	Chalk & Talk
MID I EXAMINATION DURING EIGHTH WEEK						
		3.6	Concept Hierarch	T1, R1	3	Chalk & Talk
		3.7	Sequential and Sub graph Patterns	T1, R1	3	Chalk & Talk
4	**CO4:** Compare and contrast different dominant Data Mining Algorithms for Clustering and apply them. [K4]	4.1	**UNIT IV:** Clustering	T2, R1	2	Chalk ,Talk &PPT
		4.2	Clustering overview	T2, R1	3	Chalk ,Talk &PPT
		4.3	K-means	T2, R1	2	Chalk & Talk
		4.4	Agglomerative	T2, R1	2	Chalk & Talk
		4.5	Hierarchical Clustering	T1, R1	2	Chalk & Talk
		4.6	DBSCAN	T1, R1	2	Chalk & Talk
		4.7	Unsupervised Cluster Evaluation,	T1, R1	3	Chalk & Talk
		4.8	Cohesion and Separation	T1, R1	1	Chalk & Talk
5	**CO5:** Interpret web data mining concepts and operations. [K2]	5.1	UNIT V: Web Data Mining	T3, R1	2	Chalk , Talk &PPT
		5.2	Web Content	T3, R1	3	Chalk , Talk &PPT
		5.3	Web Usage	T3,	2	Chalk , Talk &PPT

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Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
		5.4	Structure Mining	T3, R1	2	Chalk , Talk &PPT
		5.5	Search Engine Basics	T3, R1	2	Chalk , Talk &PPT
		5.6	Ranking of Web Pages	T3, R1	2	Chalk , Talk &PPT
		5.7	Enterprise Search	T3, R1	2	Chalk , Talk &PPT
TOTAL					70	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Text Books:

1. *Introduction to Data Mining*, Tan, Steinbach, and Vipin Kumar, Pearson Education, 2016
2. *Data Mining: Concepts and Techniques* (2nd Edition), Jiawei Han and Micheline Kamber, ELSEVIER
3. *Data Mining*, Vikram Pudi and P. Radha Krishna, Oxford University Press

Reference Books:

1. *Data Mining: The Textbook*, Charu C. Aggarwal, Springer, May 2015

Web resources:

1. https://nptel.ac.in/courses/106/105/106105174/
2. https://www.saedsayad.com/data_mining.htm
3. https://ocw.mit.edu/courses/15-062-data-mining-spring-2003/pages/lecture- notes/
4. https://www2.cs.uh.edu/~arjun/courses/dm/
5. https://www.rdatamining.com/resources/online-documents-books-andtutorials
6. https://dataminingbook.info/book_html

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MACHINE LEARNING WITH PYTHON

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20MCA301	MACHINE LEARNING WITH PYTHON (R20)	III	MCA	3	A,B&C

COURSE OUTCOMES:

After completion of the course, the students would be able to:

CO1: Identify suitable machine learning techniques for a given problem.

CO2: Solve problems using various machine learning techniques.

CO3: Apply dimensionality reduction techniques.

CO4: Design applications using machine learning approaches.

CO5: Analyze various evaluation and fitness models used in GA and GP, and assess how they influence convergence, optimization quality, and solution diversity.

CO6: Apply Bayesian learning techniques—especially Naive Bayes and EM—to build and evaluate a text classification system, interpreting results and performance metrics.

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT I			
1	**CO1**: Identify suitable machine learning techniques for a given problem.	1	Introduction – Learning problems, designing learning systems,	T1	10	Chalk & Talk, PPT
		2	issues in ML, concept learning,	T1		
		3	version spaces, candidate elimination, inductive bias.	T1		
			UNIT II			
2	**CO2**: Solve problems using various machine learning techniques.	1	Supervised & Unsupervised	T1, T2	12	Chalk & Talk, PPT, Lab Practice
		2	learning – Decision tree learning, KNN,	T1, T2		
		3	LWR, RBF, Case-based reasoning.	T1, T2		
			UNIT III			
3	**CO3**: Apply dimensionality reduction techniques.	1	Artificial Neural Networks –	T1	8	Chalk & Talk, PPT
		2	representation, perceptron	T1		
		3	model, applications.	T1		
	MID I EXAMINATION DURING EIGHTH WEEK					
			UNIT IV			
4	**CO4**: Design applications using machine learning approaches.	1	Multilayer networks,	T1	10	Chalk & Talk, PPT, Case Study
		2	backpropagation algorithm,	T1		
		3	case study: Face Recognition.	T1		
			UNIT V			
5	**CO5**: Analyze various evaluation and fitness models used in GA and GP, and assess how they influence convergence, optimization quality,	1	Genetic algorithms – hypothesis	T1, T2		Chalk & Talk, PPT
		2	search, GP, evaluation models,	T1, T2		
		3	parallelizing GA.	T1, T2		

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	and solution diversity.					
			UNIT VI			
6	**CO6:** Apply Bayesian learning techniques—especially Naive Bayes and EM—to build and evaluate a text classification system, interpreting results and performance metrics.	1	Bayesian learning – Bayes theorem, likelihood estimation,	T1, T2	12	Chalk & Talk, PPT, Lab Practice
		2	MDL principle, Bayes optimal classifier,	T1, T2		
		3	Gibbs algorithm, Naive Bayes, Bayesian networks, EM algorithm, case study: text classification.	T1, T2		
				TOTAL	**60**	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Textbooks:

- 1. Tom M. Mitchell – Machine Learning, McGraw Hill.
- 2. Peter Harrington – Machine Learning in Action, DreamTech.

Reference Books:

- 1. Henrik Brink et al. – Real World Machine Learning.
- 2. Christopher Bishop – Pattern Recognition and Machine Learning.
- 3. Hastie, Tibshirani & Friedman – Elements of Statistical Learning.
- 4. Han & Kamber – Data Mining: Tools and Techniques.
- 5. Witten, Frank & Hall – Data Mining: Practical ML Tools.

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DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20MCA302	**WEB TECHNOLOGIES** (R20)	III	MCA	5	A, B & C

COURSE OUTCOMES: The student is able to

CO 1: Acquaint with necessary fundamental skills for creating web applications. **[K1 and K2]**

CO 2: Install and manage web server software and study server side scripting languages likeservlets and JSP. **[K2 and K3]**

CO 3: Acquire the concepts of java beans. **[K4]**

CO 4: Understand database access and use it in JSP and servlets. **[K4]**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1**: Acquaint with necessary fundamental skills for creating web applications. **[K1 and K2]**		**UNIT-1.Review of HTML 5**			
		1.1	HTML Common Tags, List, Tables, images, forms, Frames, SVG.	T1,T3, R1	2	Chalk & Talk
		1.2	CSS3: Images, Rounded Corners, Shadows, Animations.	T1, R1,R3	2	Chalk & Talk ,PPT
		1.3	Client side Scripting: Introduction to JavaScript: JavaScript language, declaring variables, scope of variables, functions.	T1, T2, R1, R3	2	Chalk & Talk
		1.4	Event handlers (onclick, onsubmit etc.), Document ObjectModel, Form validation, Simple AJAX application.	T1, R1,T3	2	Chalk & Talk
2	**CO 2:** Install and manage web server software and study server side scripting languages likeservlets and JSP. **[K2 and K3]**		**UNIT-2. Introduction to Swing**			
		2.1	Differences between AWT Controls & Swing Controls	T1, R1	2	Chalk & Talk
		2.2	HandlingSwing Controls like Icons, Buttons,Text Boxes, Combo Boxes, Tabbed Panes, Scroll Panes	T1, T2, R1	4	Chalk & Talk, PPT
		2.3	Layout Managers, Trees, Tables, Developing a Home page using Applets & Swing.	T1, T2,T3, R2,R3	3	Chalk & Talk
		2.4	Introduction to Applets, Life cycle of an Applet, Japplet.	T2, R2	2	Chalk & Talk
3	**CO 3:** Acquire the concepts of java beans.**[K4]**		**UNIT-3. Introduction to Servlets**			
		3.1	Lifecycle of a Servlet, JSDK, the Servlet API, Types of Servlet (HTTP and Generic).	T1, T2, R1	2	Chalk & Talk, Tutorial
		3.2	The javax.servlet Package, Reading Servlet parameters, Reading Initialization Parameter The javax.servlet.HTTP package.	T1, T2, R1, R3	3	Chalk & Talk, PPT
		3.3	Handling, Http Request & Responses, Using Cookies, Session Tracking, Security Issues.	T1, T2,T3, R1,R3	2	Chalk & Talk
	MID I EXAMINATION DURING EIGHTH WEEK					

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4	CO 4: Understand database access and use it in JSP and servlets.[K4]	**UNIT-4. Introduction to JSP**				
		4.1	The Problem with Servlets, The Anatomy of a JSP Page.	T1, T2, R2	2	Chalk & Talk
		4.2	Differences between Servlets and JSP, JSP Processing.	T1, T2, R3	2	Chalk & Talk ,PPT
		4.3	JSP Application Design with MVC.	T1, T2, R2	2	Chalk & Talk
		4.4	Setting Up theJSP Environment: Installing the Java Software Development Kit.	T1, T2, R2	2	Chalk & Talk
		4.5	Tomcat Server & Testing Tomcat.	T1, T2, R2	2	Chalk & Talk
5	CO 3: Acquire the concepts of java beans.[K4]	**UNIT 5. JSP Application Development & Java Beans**				
		5.1	Generating Dynamic Content, Using Scripting Elements, Implicit JSP Objects	T1, T2, R2	2	Chalk & Talk
		5.2	Declaring Variables and Methods, Error Handling and Debugging, Sharing Data between JSP Pages, Requests and Users.	T1, T2, R2	2	Chalk & Talk
		5.3	Introduction to Java Beans, Advantages of Java Beans, Introspection, Using Bou Properties, Bean Info Interface, Constrained Properties.	T1, T2, R2	2	Chalk & Talk
		5.4	Persistence, Customizers, Java Beans API, Deploying JAVA Beans in a JSP Page.	T1, T2, R2	2	Chalk & Talk
6	CO 4: Understand database access and use it in JSP and servlets.[K4]	**UNIT6: Database Access**				
		6.1	Database Programming using JDBC	T1, T2, R1	3	Chalk & Talk, PPT
		6.2	JDBC Drivers	T1,T3, R1, R3	3	Chalk & Talk, PPT
		6.3	Studying javax.sql.*Package, Prepared statement, Result set.	T1,T3, R1	2	Chalk & Talk
		6.4	Accessing a Database from a JSP Page, Application Specific Database Actions.	T1, T2, R1	2	Chalk & Talk, PPT
				Total	58	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1 The Complete Reference Java2, 8/e, Patrick Naughton, Herbert Schildt, TMH.

T2 Java Server Faces, Hans Bergstan, O'reilly.

T3 Internet and World Wide Web: How to program,6/e, Dietel, Dietel, Pearson(2008).

Reference Books:

R1 Web Tehnologies, 2/e, Godbole, kahate, TMH.

R2 Web Programming, building internet applications, 2/e, Chris Bates, Wiley Dreamtech.

R3 An Introduction to Web Design , Programming ,Wang,Thomson

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NETWORK SECURITY AND CRYPTOGRAPHY

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20MCA303	NETWORK SECURITY AND CRYPTOGRAPHY (R20)	III	MCA	7	A,B&C

COURSE OUTCOMES:

After completion of the course, the students would be able to:

CO1: Analyze vulnerabilities and design security solutions.

CO2: Identify and resolve security issues in networks.

CO3: Evaluate security mechanisms using theoretical approaches.

CO4: Compare IEEE standards and electronic mail security techniques.

CO5: Apply security and privacy mechanisms in EDI such as Email.

CO6: To design security applications in the field of information technology

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT I			
1	**CO1**: Analyze vulnerabilities and design security solutions.	1	Introduction – security attacks, services,	T1	10	Chalk & Talk, PPT
		2	mechanisms, internetwork security model,	T1		
		3	Internet standards and RFCs.	T1		
			UNIT II			
2	**CO2**: Identify and resolve security issues in networks.	1	Conventional Encryption – principles,	T1	12	Chalk & Talk, PPT, Tutorial
		2	algorithms, block cipher modes,			
		3	encryption device placement, key distribution,			
		4	message authentication approaches,			
		5	hash functions & HMAC.			
			UNIT III			
3	**CO3**: Evaluate security mechanisms using theoretical approaches.	1	Public Key Cryptography – principles,	T1	10	Chalk & Talk, PPT
		2	algorithms, digital signatures, certificates, CA,	T1		
		3	key management, Kerberos, X.509 authentication.	T1		
			MID I EXAMINATION DURING EIGHTH WEEK			
4			**UNIT IV**			

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	CO4: Compare IEEE standards and electronic mail security techniques.	1	Security – architecture, authentication header, ESP,	T1	10	
		2	combining security associations,	T1		
		3	key management.	T1		
5	**CO5**: Apply security and privacy mechanisms in EDI such as Email.	**UNIT V**				
		1	Web Security – SSL,	T1	10	Chalk & Talk, PPT, Case Study
		2	TLS, SET; Email privacy – PGP,	T1		
		3	S/MIME.	T1		
		UNIT VI				
6	**CO6:**To design security applications in the field of information technology	1	Intruders, viruses,	T1	10	Chalk & Talk, PPT, Lab Practice
		2	threats, firewalls, IDS,	T1		
		3	trusted systems.	T1		
			TOTAL		**62**	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Textbooks:

- 1. Network Security Essentials: Applications and Standards – William Stallings.

Reference Books:

- 1. Network Security & Cryptography – Bernard Menezes.
- 2. Fundamentals of Network Security – Eric Maiwald.
- 3. Network Security: Private Communication in a Public World – Kaufman, Perlman.
- 4. Principles of Information Security – Whitman.
- 5. Cryptography and Network Security – Stallings.
- 6. Network Security: The Complete Reference – Bragg & Rhodes.
- 7. Introduction to Cryptography – Buchmann.

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DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS
LESSON PLAN-A.Y-2023-2024

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20MCA307	UNIFIED MODELING LANGUAGE (R20)	III	MCA	5	A, B & C

COURSE OUTCOMES: The student is able to

CO1: Analyze software requirements and document those using Use Cases. **[K4]**

CO2: Utilize the notation of the UML diagrams such as Use Case, Class, Sequence, Activity,State chart, Deployment and Package Diagrams. **[K3]**

CO3: Acquire the knowledge of Library Files, Executable Files, Processors and Devices fora system. **[K6]**

CO4: Build the Forward and Reverse Engineering using UML notations. **[K6]**

Unit No	Outcome		Topics/Activity	Ref Text book	Total Perios	Delivery Method
1	**CO1**:Analyze software requirements and document those using Use Cases.**[K4]**		**UNIT-1. Introduction to UML**			
		1.1	The Meaning of Object-Orientation, Object Identity, Encapsulation,	T1, R1	2	Chalk & Talk
		1.2	Information Hiding, Polymorphism, Genericity	T1, R1	2	PPT
		1.3	Importance of Modeling, Principles of Modeling, Object Oriented Modelling,	T1, T2, R1	2	Seminars
		1.4	An Overview of the UML, A Conceptual Model of the UML, Architecture and Software Development Life Cycle.	T1, R1	2	Chalk & Talk
2	**CO2**: Utilize the notation of the UML diagrams such as Use Case, Class, Sequence, Activity, State chart, Deployment and Package Diagrams. **[K3]**		**UNIT-2. Basic Structural Modeling**			
		2.1	Classes: Terms and Concepts, Common Modeling Techniques-Modeling the Vocabulary of a System,	T1, R1	2	Chalk & Talk
		2.2	Relationships: Terms and Concepts, Common Modelling Techniques-Modelling Simple Dependencies	T1, T2, R1	4	Chalk & Talk, PPT
		2.3	Diagrams: Terms and Concepts, Common Modeling Techniques-Modeling Different Views of a System, Modeling Different Levels of Abstraction, Modeling Complex Views.	T1, T2, R2	3	Chalk & Talk
		2.4	Advanced Structural Modeling:	T2, R2	2	Chalk & Talk
3	**CO3**: Acquire the knowledge of Library Files, Executable Files, Processors and Devices fora system. **[K6]**		**UNIT-3. Basic Behavioral Modeling-I**			
		3.1	Interactions, Interaction Diagrams	T1, T2, R1	2	Chalk & Talk, Tutorial
		3.2	Sequence Diagrams	T1, T2, R1	3	Chalk & Talk,PPT
		3.3	Collaboration Diagrams	T1, T2, R1	2	Chalk & Talk,Case Study
	MID I EXAMINATION DURING EIGHTH WEEK					

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4	**CO1**: Analyze software requirements and document those using Use Cases. **[K4]**	**UNIT-4. Basic Behavioral Modelling-II**				
		4.1	Use Cases	T1, T2, R2	2	Chalk & Talk
		4.2	Use Case Diagrams	T1, T2, R2	2	PPT, Seminars
		4.3	Modeling the Requirements of a System, Forward and Reverse Engineering	T1, T2, R2	2	Chalk & Talk
		4.4	Activity Diagrams	T1, T2, R2	2	Chalk & Talk, Tutorial
		4.5	Common Modeling Techniques-Modeling a Workflow, Modeling an Operation, Forward and Reverse Engineering	T1, T2, R2	2	Chalk & Talk
5	**CO4:** Build the Forward and Reverse Engineering using UML notations. **[K6]**	**UNIT 5. Advanced Behavioral Modeling**				
		5.1	Events and Signals	T1, T2, R2	2	Chalk & Talk
		5.2	State Machines	T1, T2, R2	2	Chalk & Talk
		5.3	Processes and Threads, Time and Space	T1, T2, R2	2	Chalk & Talk
		5.4	State Chart Diagrams	T1, T2, R2	2	Chalk & Talk
6	**CO2**: Utilize the notation of the UML diagrams such as Use Case, Class, Sequence, Activity,State chart, Deployment and Package Diagrams. **[K3]**	**UNIT6: Architectural Modeling**				
		6.1	Components	T1, T2, R1	3	Chalk & Talk, PPT
		6.2	Deployment	T1, R1	3	Chalk & Talk, PPT
		6.3	Component Diagrams	T1, R1	2	Chalk & Talk
		6.4	Deployment Diagrams	T1, T2, R1	2	Chalk & Talk, PPT
				Total	58	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1 Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education,2004, 2007, 2009(UNIT-I, UNIT-II, Chapter 1 & 2 of UNIT-III,UNIT-IV, UNIT-V, UNIT -VI)

T2 Meilir Page-Jones: Fundamentals of Object-Oriented Design in UML, Pearson Education,2005 (Chapter 3 & 4 of UNIT-III).

Reference Books:

R1 Appling UML and Patterns: An introduction to Object–Oriented Analysis and Design andUnified Process, Craig Larman, Pearson Education.

R2 The Unified Modeling Language Reference Manual, 2/e, Rambaugh, Grady Booch,etc.,PEA

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NEC	Narasaraopeta Engineering College (Autonomous) Yallmanda(Post), Narasaraopet- 522601

HUMAN RESOURCE MANAGEMENT

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20MCA308	HUMAN RESOURCE MANAGEMENT (R20)	III	MCA	3	A,B&C

COURSE OUTCOMES:

After completion of the course, the students would be able to:

CO1: Outline the functions and challenges of HRM. [K4]

CO2: Apply HR Planning, Recruitment, Selection, Training and Executive Development Programs. [K3]

CO3: Apply Job Analysis, Job Description, Job Specification, Ergonomics and Job Evaluation. [K3]

CO4: Utilize various methods of Performance Appraisal. [K3]

CO5: Develop global compensation mechanisms and incentive plans. [K6]

CO6: Examine Trade Unions, Grievance Handling, Industrial Disputes and Stress Management. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			UNIT I			
1	**CO1:** Outline the functions and challenges of HRM. [K4]	1	Introduction to HRM – Definition,	T1, T2	10	Chalk & Talk, PPT
		2	Nature & Scope, Functions,	T1, T2		
		3	Role & Position of HRM, PM vs HRM, Challenges of HRM.	T1, T2		
			UNIT II			
2	**CO2:** Apply HR Planning, Recruitment, Selection, Training and Executive Development Programs. [K3]	1	Operative Functions – HR Planning Process, Recruitment (Internal/External),	T1, T2	12	Chalk & Talk, PPT, Case Study
		2	Selection Procedure, Selection Tests, Interview Techniques,	T1, T2		
		3	Training (On/Off Job), Executive Development Programs.	T1, T2		
			UNIT III			
3	**CO3:** Apply Job Analysis, Job Description, Job Specification, Ergonomics and Job Evaluation. [K3]	1	Job Analysis – Job Description, Job Specification, Job Enrichment,	T1	10	Chalk & Talk, PPT
		2	Job Sharing, Telecommuting, Ergonomics,			
		3	, Job Design, Job Evaluation.			
	MID I EXAMINATION DURING EIGHTH WEEK					
			UNIT IV			
4	**CO4:** Utilize various methods of Performance Appraisal. [K3]	1	Performance Appraisal – Traditional & Modern Methods,	T1, T2	10	Chalk & Talk, PPT, Tutorial
		2	Latest Trends, Compensation Concepts,	T1, T2		
		3	Current Trends, Methods of Payment.	T1, T2		
			UNIT V			
5	**CO5:** Develop global compensation	1	Wage & Salary Administration – Wage Structure,	T1, T2	10	Chalk & Talk, PPT

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	mechanisms and incentive plans. [K6]	2	Legal Framework, Wage Determination, Incentive Systems,	T1, T2		
		3	Statutory & Non-Statutory Welfare Measures.	T1, T2		
		UNIT VI				
6	**CO6:** Examine Trade Unions, Grievance Handling, Industrial Disputes and Stress Management. [K4]	1	Industrial Relations – Trade Unions, Grievance Handling,	T1, T2	12	Chalk & Talk, PPT, Case Study
		2	Collective Bargaining, Industrial Dispute Resolution,	T1, T2		
		3	Industrial Safety, Stress Management.	T1, T2		
				TOTAL	64	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Textbooks:

- 1. K. Aswathappa – Human Resource & Personnel Management, Tata McGraw Hill.
- 2. Subba Rao P – Personnel and Human Resource Management, Himalaya Publications.

Reference Books:

- 1. N. Sambasiva Rao & Nirmal Kumar – HRM & Industrial Relations.
- 2. Mathis, Jackson, Tripathy – HRM: South Asian Perspective.
- 3. Madhurima Lall, Sakina Qasim – HRM, Excel Books.
- 4. Muller-Camen, Croucher, Leigh – HRM Case Study Approach.
- 5. Seetharaman & Prasad – HRM, Scitech Publications.
- 6. Gary Dessler – HRM, Pearson.
- 7. Uday Kumar Haldar – HR Development, OUP.
- 8. Narendar Singh – HRM, Universities Press.
- 9. B.B. Mahapatro – HRM, New Age International.
- 10. R.S. Dwivedi – Human Relations & OB, MacMillan.

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E-COMMERCE
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Section
R20MCA403	E-COMMERCE(R20)	IV	MCA	8	A,B,C

CO1:.Demonastrate an understanding of the foundations and importance of E-commerce. [K1and K2]

CO2: Demonstrate an understanding of retailing in E-commerce [K1and K2]

CO3: Analyze the impact of E-commerce on Business models and strategy. [K4]

CO4: Describe Internet trading relationships including Business to Consumer, Business –Business & Intra organizational. [K4]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
			Unit-1			
1	CO1: Demonstrate an understanding of the foundations and importance of E-commerce [K1 and K2]	1	Electronic Commerce	T1 R1	14	Chalk & Talk,
		2	Frame Work, Anatomy of E-Commerce,	T1		
		3	E-CommerceConsumer Applications, E-Commerceorganization applications	T1		
			Unit-2			
2	CO2: Demonstrate an understanding of retailing in E-commerce. [K1and K2]	1	Consumer Oriented Electronic commerce	T1	5	Chalk & Talk,
		2	Mercantile Process models	T1		
	ASSIGNMENT I EXAMINATION DURING FOURTH WEEK					
			Unit-3			
3	CO3: Demonstrate an understanding of retailing in E-commerce [K2]	1	Electronic payment Systems	T1, R1	10	Chalk & Talk,
		2	Digital Token-Based	T1, R1		
		3	Smart Cards, Credit Cards	T1, R1		
		4	Risks in Electronic Payment systems	T1, R1		

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MID I EXAMINATION DURING EIGHTH WEEK						
4	CO4: Describe Internet trading relationships including Business to Consumer, Business & Intra organizational. [K4]	**Unit-4 Intra Organizational Commerce**				
		1	WorkFlow,Automation Customization and internal Commerce	T1, R2	6	Chalk & Talk, PPT
		2	Supply chain Management	T1		
5	CO5: Demonstrate an understanding of retailing in E-commerce.[K2]	**Unit-5 Corporate Digital Library**				
		1	Document Library,Digital Document Types	T1, R1	14	Chalk & Talk, PPT
		2	Corporate Data Warehouses, Adverising and Marketing	T1, R1		
		3	Information based marketing,Advertising on Internet, on-line marketing process,market research.	T1, R1		
ASSIGNMENT II EXAMINATION DURING FOURTH WEEK						
6	CO6: Analyze the impact of E-commerce on Business models and strategy. [K4]	UNIT-6 **Cluster Analysis: Basic Concepts and Algorithms**				
		1	Consumer Search and Resource Discovery, Information search and Retrieval	T1, R1	16	Chalk & Talk, PPT
		2.	Commerce Catalogues, Information Filtering, Multimedia-key multimedia concepts	T1, R1		
		3	Digital Video and electronic Commerce,Desktop video processing's. Desktop video conferencing.	T1, R1		
				Total	65	
MID II EXAMINATION DURING SIXTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1: Frontiers of Electronic Commerce, Kolkata, Whinstone, PEA, 2006.

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Reference Books:

R1: E-Commerce Fundamentals and Applications Hendry Chan, Raymond Lee, Dillon, Chang, John Wiley.
R2:E-Commerce, A Managerial Perspective, Turban E, Lee J , King, Chung H.M.,PEA,2001.
R3: E-Commerce An Indian Perspective , 3/e, P.T. Joseph, PHI,2009.
R4: E-Commerce, S.Jaiswal. , Golgothia.
R5: Electronic Commerce , Gary Schneider, Thomson.

WEB REFERENCES

1. http://www.udemy.com/topic/e-commerce
2. http://www.nptel.ac.in/topic/e-commerce

Principal HOD Faculty D.L.Dheeraja

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DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS
LESSON PLAN

Course Code	Course Title (Regulation)	Sem	Branch	Contact Periods/Week	Sections
R20MCA406	HUMAN COMPUTER INTERACTION (R20)	IV	MCA	8	A,B&C

COURSE OUTCOMES: The student is able to

CO 1: Outline knowledge about user interface design. [K2]
CO 2: Summarize the importance of Graphical User Interface. [K2]
CO 3: Apply the strategies used in design process. [K3]
CO 4: Summarize the importance of screen designing. [K2]
CO5: Apply the various operations of Windows. [K3]

Unit No	Outcome		Topics/Activity	Ref Text book	Total Periods	Delivery Method
1	**CO1:** Outline knowledge about user interface design. [K2]		**UNIT-1 Introduction**			
		1.1	Importance of user Interface, definition	T1,T2, R1	1	Chalk & Talk
		1.2	importance of good design. Benefitsof good design.	T1, R1	2	Chalk & Talk
		1.3	A brief history of Screen design	T1,T3, R1	1	Chalk & Talk
		1.4	The graphical user interface: Popularity of graphics	T1, R1,R3	2	Chalk & Talk ,PPT
		1.5	the concept of direct manipulation	T1, R1,R3	2	Chalk & Talk
		1.6	graphical system, Characteristics	T1, T2, R1, R3	1	Chalk & Talk
		1.7	Web user – interface popularity, characteristics	T1, R1	2	Chalk & Talk
		1.8	Principles of user interface.	T1, R1	2	Chalk & Talk
2	**CO2**: Summarize the importance of Graphical User Interface. [K2]		**UNIT-2 Design process**			
		2.1	Human interaction with computers	T1, R1	2	Chalk & Talk
		2.2	importance of human characteristics human consideration	T1, T2, R1	3	Chalk & Talk, PPT
		2.3	Human interaction speeds	T1, T2,R2,R3	3	Chalk & Talk
		2.4	Understanding business junctions	T2, R2	2	Chalk & Talk
			ASSIGNMENT -1 EXAMINATION DURING 4th WEEK			
3			**UNIT-3 Screen Designing**			
		3.1	Design goals, Screen planning and purpo...	T2, R1	2	Chalk & Talk

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	CO3: Apply the strategies used in design process. [K3]	3.2				
		3.3	Screen planning and purpose,	T1, T2, R1	2	Chalk & Talk,
		3.4	organizing screen elements, ordering of screen data and content	T1, T2, R1	2	Chalk & Talk,
		3.5	screen navigation and flow	T1, T2, R1,R3	2	Chalk & Talk, PPT
		3.6	Visually pleasing composition,	T1, T2, R1,R3	2	Chalk & Talk, PPT
		3.7	amount of information, focus and emphasis.	T1, T2, R3	2	Chalk & Talk, PPT
		3.8	presentation information simply and meaningfully	T1, T2, R1,R3	2	Chalk & Talk
		3.9	information retrieval on web, statistical graphics	T1, T2, R1,R3	2	Chalk & Talk
		3.10	Technological consideration in interface design.	T1, T2, R1,R3	2	Chalk & Talk
	MID I EXAMINATION DURING EIGHTH WEEK					
4	CO4: Summarize the importance of screen designing. [K2]		UNIT-4 Windows			
		4.1	Windows new and Navigation schemes	T2, R2	2	Chalk & Talk
		4.2	selection of window	T2, R3	2	Chalk & Talk ,PPT
		4.3	selection of devices based screen based controls.	T2, R2	3	Chalk & Talk
5	CO5: Apply the various operations of Windows. [K3]		UNIT 5 Components			
		5.1	Components text and messages	T2, R2	2	Chalk & Talk
		5.2	Icons and increases	T2, R2	2	Chalk & Talk
		5.3	Multimedia, colors	T2, R2	2	Chalk & Talk
		5.4	uses problems choosing colors.	T2, R2	2	Chalk & Talk
	ASSIGNMENT-2 EXAMINATION DURING 12th WEEK					
			UNIT6 Software tools			

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6	CO5:Apply the various operations of Windows. [K3]	6.1	Specification methods, interface, Building Tools.	T1, T2, R1	3	Chalk & Talk, PPT
		6.2	Interaction Devices: Keyboard and function keys.	T1,T2, R1, R3	3	Chalk & Talk, PPT
		6.3	pointing devices, speech recognition digitization and generation	T1,T2, R1	2	Chalk & Talk
		6.4	image and video displays, drivers	T1, T2, R1	2	Chalk & Talk, PPT
				Total	63	
MID II EXAMINATION DURING EIGHTEENTH WEEK						
END EXAMINATIONS						

Text Books:

T1:Human Computer Interaction. 3/e, Alan Dix, Janet Finlay, Goryd, Abowd, Russell Beal, PEA, 2004.
T2:The Essential guide to user interface design, 2/e, Wilbert O Galitz, Wiley Dreama Tech.

Reference Books:

R1 Designing the user interface. 4/e, Ben Shneidermann, PEA.

R2 User Interface Design, Soren Lauesen , PEA.

R3 Interaction Design PRECE, ROGERS, SHARPS, Wiley .

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