Academic Regulations, Course Structure and Syllabus

B. TECH.

Computer Science and Engineering

(4 Year Program)

NARASARAOPETA
ENGINEERING COLLEGE
(Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.
Approved by AICTE, New Delhi & Permanently affiliated to JNTUK, Kakinada. Code: 47.
Accredited by NBA & NAAC with "A" Grade; ISO 9001:2008 Certified Institution.
Phone: 08647239905   Website: www.nrtec.ac.in

ACADEMIC REGULATIONS - 2016 FOR B.Tech (REGULAR)
(Applicable for the students of B.Tech from the Academic Year 2016-17)

1. Eligibility for Admission

The total seats available as per the approved intake are grouped into two categories viz. category A and Category B with a ratio of 70:30 as per the state government guidelines vide G.O No.52

    a. The admissions for category A and B seats shall be as per the guidelines of Andhra Pradesh State Council for Higher Education (APSCHE) in consonance with government reservation policy.

    ❖ Under Category A: 70% of the seats are filled through EAMCET counselling.

    ❖ Under Category B: 30% seats are filled based on 10+2 merits in compliance with guidelines of APSCHE

    b. Admission eligibility-Under Lateral Entry Scheme

    Students with diploma qualification have an option of direct admission into 2nd year B. Tech. (Lateral Entry scheme). Under this scheme, 20% seats of sanctioned intake will be available in each course as supernumerary seats. Admissions to this three year B Tech later entry Programme will be through ECET. The maximum period to complete B. Tech. under Lateral Entry scheme is six consecutive academic years from the date of joining.

The selection for category A & B seats shall be as per Govt. of Andhra Pradesh rules.

2. AWARD OF B.TECH. DEGREE

A student will be declared eligible for the award of the B.Tech. Degree if he fulfils the following academic requirements.

(a) Pursue a course of study for not less than four academic years and not more than eight academic years counted from the academic year of admission.

(b) The student registers for 180 credits and secures all the 180 credits.

3. COURSES OF STUDY

The following UG- B.Tech Programs are offered at present

S. No.	Branch Code-Abbreviation	Branch
01	01-CE	Civil Engineering
02	02-EEE	Electrical and Electronics Engineering
03	03-ME	Mechanical Engineering
04	04-ECE	Electronics and Communication Engineering
05	05-CSE	Computer Science and Engineering

And any other course as approved by the authorities from time to time.

4. STRUCTURE OF THE PROGRAM

Program comprises of 4 academic years and each year has 2 semesters.
Each course is normally assigned a certain number of credits as follows:

- ➢ 3 credits for 3 lecture periods and 1 tutorial per week.
- ➢ 3 credits for 4 lecture periods per week
- ➢ 2 credits for 3 laboratory periods per week.
- ➢ 3 credits for 1 lecture and 4 practice periods for drawing subjects per week.
- ➢ 1 or 2 credits for Mini Project.
- ➢ 3 credits for Practical Training/ Internship.
- ➢ 10 credits for Project Work.

5. DISTRIBUTION AND WEIGHTAGE OF MARKS

The performance of a student in each semester shall be evaluated subject-wise with a maximum of 100 marks for Theory, Practical Training / Internship and 75 marks for Practical's / Mini Project. The Project Work shall be evaluated for 200 marks.

5.1 THEORY

For all theory subjects consisting of 6 units in each subject, the assessment shall be for 40 marks through internal evaluation and 60 marks through external end semester examination of 3 hours duration.

5. 1a. INTERNAL EVALUATION

The internal evaluation will be based on two cycle tests conducted in each semester. The 40 internal marks will be awarded as sum of 75% of the best cycle and 25% of the least cycle examinations, where each cycle of examination contain

Descriptive test	- 20 Marks
Objective test	- 10 Marks
Assignment test	-10 Marks

Each descriptive test question paper contains 3 questions one from each unit covering syllabus from 3 units (first 3 units for first cycle and remaining 3 units for second cycle). The student has to answer all the 3 questions (3X10M=30M). The 30 marks will be scaled down to 20 marks. The descriptive examination will be conducted for 1½ hour duration.

Online Objective type test question paper shall contain 20 objective questions for 10 marks covering syllabus from 3 units, which are considered for descriptive type test (20 X 1/2 M = 10M). The Objective Examination will be conducted for 20 minutes duration along with descriptive test.

In Assignment Tests, 5 or 6 questions will be declared in the class room at least one week in advance. In the test, one question will be given at random to each student and the student has to answer it.

The Assignment Test-1 will be conducted for 10 marks covering the syllabus of 1st unit. The Assignment Test-2 will be conducted for 10 marks covering the syllabus of 2nd unit. The internal marks for Assignment Test (10 Marks) for cycle-I shall be computed as best of two Assignment Tests-1 & 2 conducted. The Assignment Test-3 will be conducted for 10 marks covering the syllabus of 4th unit. The Assignment Test-4 will be conducted for 10 marks covering the syllabus of 5th unit. The internal marks for Assignment Test (10 Marks) for cycle-II shall be computed as best of two Assignment Tests-3 & 4 conducted.

5.1b. EXTERNAL EVALUATION

The question paper comprises of two parts i.e. Part-A and Part-B. Part-A is compulsory and consists of six 2 marks questions covering all units. Part A is total 12 marks. Part-B

consists of 6 questions, one from each unit and the student has to answer any four questions, and each question carries 12 marks. The examination duration is 3 hours.

5.2 PRACTICALS

For practical subjects there shall be continuous evaluation during the semester.

5.2. a. INTERNAL EVALUATION

There shall be continuous evaluation during the semester for 25 internal marks.
The internal marks shall be awarded as follows:

        Record   - 10 Marks
        Internal Lab Test   - 10 Marks
        Day to day performance   - 5 Marks

5.2. b. EXTERNAL EVALUATION

For practical subjects there shall be an external examination at the end of the semester for 50 marks in the presence of external examiner. The examination duration is 3 hours.

5.3 DRAWING SUBJECTS

a. For the subject having design or drawing (such as Engineering Graphics, Engineering Drawing, Machine Drawing etc.,), the distribution shall be 40 marks for Internal Evaluation and 60 marks for End Examination.
The 40 internal marks will be evaluated as follows:
        Internal Tests   - 20 marks. (1½ hour duration)
        Day to day work   - 20 marks (evaluation of drawing sheets)
In the internal test, 3 questions will be given to the student and he has to answer all the three questions (3x10M = 30M scaled down to 20 marks)

There shall be two internal tests in a semester. The sum of 75% of the best and 25% of the least of two internal tests shall be considered for the award of internal marks.

b. The syllabus for the subject "**Machine drawing using Auto CAD**" consists of two major portions:

        1. Unit I to III –Conventional drawing pattern.
        2. Unit IV to VI-Computer lab pattern using any drafting package
The distribution of internal and external marks is 40 and 60 marks respectively.

Internal Evaluation: Max Marks: 40
 The total internal evaluation marks are distributed in the following two components:
        1. Day-to-day work   : 20 Marks (Evaluation of Charts)
        2. Descriptive Test   : 20 Marks
Cycle–I Examination – Conventional drawing pattern
In Cycle-I examination the 40 marks will be awarded as follows:
        Day-to-day evaluation - 20 Marks
        Descriptive Test   - 20 Marks
In the Descriptive Test of duration 2 hours, 3 questions will be given to the student and he has to answer all the three questions (3x10M = 30M scaled down to 20 marks).
Cycle–II Examination – Computer lab pattern using any drafting package for duration of 2 hours.

In Cycle-II examination the 40 marks will be awarded as follows:

Record	-10 Marks
Execution	-15 Marks
Paper Work	-15 Marks

Of two cycle examinations conducted during the semester, sum of 75% of the best and 25% of the least of two cycle examinations shall be considered for the award of internal marks.

End semester Examination (Total Duration: 4 hours, Max. Marks: 60)
Conventional drawing pattern (Duration: 2 Hours, Marks: 30)
Computer lab pattern using any drafting packages (Duration: 2 Hours, Max: 30)
(Note: Both Conventional drawing pattern and Computer lab pattern using any drafting packages are compulsory and are to be conducted in separate sessions)

5.4 MANDATORY NON-CREDIT COURSES

A student is required to take up Non-Credit/mandatory courses, viz. Advanced Communication Skills, Quantitative Aptitude, Verbal Ability, Reasoning, NSS / Sports & Games and MOOCs (Massive Open Online Courses) etc., as and when the courses are offered. The B.Tech degree shall only be awarded if a student gets satisfactory grade in each of the mandatory non-credit courses besides acquiring 180 credits.
A student has to repeat the course if he does not get satisfactory grade in each non-credit course for getting the degree awarded.
 NSS
There shall be internal valuation for 100 Marks, out of which 60 marks are for participation and involvement in day-to-day activities and 40 marks for participation and involvement in a three days NSS camp arranged during the semester.
Sports and Games
There shall be two internal valuations, each for 50 marks, in the chosen activity, one in the middle of semester and the other towards the end of the semester. Sum of the two valuations shall be taken as the final marks for 100.

MOOCs: Meeting with the global requirements, to inculcate the habit of self-learning and in compliance with UGC guidelines, MOOCs (Massive Open Online Courses) have been introduced. Student has to complete an on-line course to fulfil the academic requirement of B.Tech course. The on-line Course should be offered by any reputed organization like NPTEL, COURSERA, edX, Udacity, SWAYAM etc., approved by the departmental Committee constituted by HOD. Student has to submit the progress of the MOOC's course (such as assignment submission etc.,) to the departmental committee. B.Tech. degree shall be awarded only upon submission of MOOC's certificate. If a student fails to submit in that semester, he/she has to submit the certificate in the subsequent semesters for getting the degree awarded.

5.5. PRACTICAL TRAINING / INTERNSHIP

Students are advised to take up Industrial Internship. In case, the student is unable to obtain the internship, they can opt for Practical Training.
Assessment for Internship:
Industrial Internship which is a part of the curriculum shall carry 100 marks. The time duration for internship shall be of 2 to 4 weeks during the inter semester break. After the completion of internship the student shall submit a certificate and a report to the concerned departmental committee constituted by the HOD for Evaluation and to conduct a Viva-

Voce Examination. Out of 100 marks, 40 marks shall be awarded for submission of certificate and report and 60 marks for presentation and Viva-Voce examination.

Assessment for Practical Training:

The practical training gained by student shall be assessed for 100 marks. The time duration for Practical Training shall be 2 to 4 weeks during the inter semester break. The training shall be evaluated through continuous assessment. After the completion of Practical Training the student shall submit a report to the Departmental Committee constituted by HOD for evaluation and to conduct a Viva-Voce Examination. Out of 100 marks 40 marks shall be awarded for day to day performance and submission of report and 60 marks for presentation and Viva-Voce examination.

5.6 MINI PROJECT

Mini Project shall be evaluated for a total of 75 marks. Out of a total of 75 marks, 25 marks shall be for internal evaluation consisting of day-to-day work, reviews, the assessment of the project report and 50 marks for the external evaluation. The external evaluation shall be conducted by the committee. The committee consists of an External Examiner, Head of the Department and Supervisor of the Project. The evaluation of mini project work shall be conducted as and when offered.

5.7 PROJECT WORK

Out of a total of 200 marks for the project work, 80 marks shall be for Internal Evaluation consisting of day-to-day work, reviews, the assessment of the project report and 120 marks for the external evaluation. The external evaluation shall be conducted by the committee. The committee consists of an External Examiner, Head of the Department and Supervisor of the Project. The evaluation of project work shall be conducted at the end of the IV year II semester.

6. PASS MARK CRITERIA

A student shall be deemed to have satisfied the pass mark, if he secures not less than 35% of marks in the end examinations and a minimum of 40% of marks in the sum total of the internal evaluation and end examination taken together as detailed below.

On passing a course of a program, the student shall earn the credits as assigned to that course.

S. No.	Category of Subject	Max. Marks	Internal Marks	External Marks	External pass %	External pass mark	Over all pass %	Over all pass mark
1	Theory/Drawing/ Practical Training/ Internship	100	40	60	35	21	40	40
2	Practical	75	25	50	35	18	40	30
3	Mini Project	75	25	50	35	18	40	30
4	Project work	200	80	120	35	42	40	80

7. PROMOTION POLICY

7.1. ATTENDANCE REQUIREMENTS

(1) A student shall be eligible to appear for the end examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects.

(2) Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester for genuine medical reasons and shall be approved by a committee duly appointed by the college. A fee stipulated by the college shall be payable towards condonation of shortage of attendance. However the number of condonations is restricted to four for the entire course.

(3) A student who is short of attendance in a semester may seek re-admission into that semester when offered next time within 4 weeks from the date of commencement of class work.

(4) If any candidate fulfils the attendance requirement in the present semester, he shall not be eligible for re-admission into the same semester.

7.2. CREDIT REQUIREMENTS

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned above.

(1) A student shall be promoted from I to II year, if he put up the minimum attendance requirement in I year II semester, irrespective of credits earned.

(2) A student shall be promoted from II year to III year, only if he fulfils the academic requirement of 50% of the credits up to II year II semester from all the examinations, irrespective of whether the candidate takes the examination or not.

(3) A student shall be promoted from III to IV year, only if he fulfils the academic requirements of 50% of the credits up to III year II semester from all the examinations, irrespective of whether the candidate takes the examination or not.

(4) A candidate, who is not promoted either to III year or IV year due to lack of required credits can seek admission into III / IV year in subsequent years after obtaining the required credits as stipulated above.

(5) A student shall register and put up minimum attendance in all 180 credits and earn all 180 credits. Marks obtained in the all 180 credits shall be considered for the calculation of grade points/division.

(6) The registrations in audit courses/ mandatory courses i.e. Advanced Communication skills, Aptitude, Verbal Ability, Quantitative Aptitude and Reasoning, NSS / Sports & Games and MOOCs etc., is compulsory and student should get a satisfactory report.

8. COURSE PATTERN

(1) The entire course of study is of four academic years and each year will have TWO Semesters (Total EIGHT Semesters).

(2) Supplementary Examinations:

A student is eligible to appear for the end examination in a subject, but absent for it or has failed in the end examinations may appear for that subject in supplementary examinations, when conducted next.

(3) Advanced supplementary Examinations:

Students who failed in courses of 4th B.Tech. 2nd Semester can appear for advanced supplementary examination conducted within one month after declaration of the

revaluation results. However, those students who failed in these advanced supplementary examinations shall appear for subsequent examinations along with regular candidates in the examinations conducted at the end of the respective semester.

(4) When a student is detained due to lack of credits / shortage of attendance, he may be re-admitted in to the same semester / year in which he has been detained.

9. METHOD FOR AWARDING OF GRADE POINTS FOR A SUBJECT:

Theory/ Drawing / Laboratory / Practical Training / Internship / Mini Project / Project (% of marks in a subject)	Corresponding Grade Points	Letter Grade
91 - 100	10	O (Outstanding)
81 - 90	9	E (Excellent)
71 - 80	8	A (Very Good)
61 - 70	7	B (Good)
51 - 60	6	C (Satisfactory)
40 - 50	5	P (Pass)
<40	0	F (Fail)

10. CRITERIA FOR AWARD OF GRADES/DIVISION

10.1 Calculation of Semester Grade Point Average (SGPA)* for semester

The performance of each student at the end of each semester is indicated in terms of SGPA. The SGPA is calculated as given below:

$$SGPA = \frac{\sum(CR \times GP)}{\sum CR}$$

Where CR = Credits of a subject
GP = Grade Points awarded for a subject

*SGPA is calculated for a student who passed all the subjects in that semester.

10.2 Calculation of Cumulative Grade Point Average (CGPA)* for Entire Program:

The CGPA is calculated as given below:

$$CGPA = \frac{\sum(CR \times GP)}{\sum CR}$$

Where CR= Credits of a subject
GP = Grade Points awarded for a subject

*CGPA is calculated for a student who passed all the subjects in previous semesters along with current semester.

- The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.
- Equivalent percentage = (CGPA – 0.75) x 10

10.3   Award of Division:

After satisfying the requirements prescribed for the completion of the program, the student shall be eligible for the award of B.Tech Degree and shall be placed in one of the following classes:

CGPA	Class
≥ 7.75	Degree with First Class with Distinction (with no subject failures)
≥ 6.75	Degree with First Class (with subject failures)
≥ 5.75 & < 6.75	Degree with Second Class
< 5.75	Degree with Pass Class

10.4 CONSOLIDATED GRADE MEMO

All the students who registered for the semester end examinations will be issued memorandum of marks by the Institute. A Consolidated Grade Memo containing credits and grades obtained by the student will be issued after completion of the four year B.Tech program.

11. REVALUATION

1. Student can submit the application for revaluation, along with the prescribed fee for revaluation of his answer script(s) of theory subject(s) as per the notification issued by the Controller of Examinations.

2. The Controller of Examinations shall arrange for revaluation of such answer script(s).

3. An External examiner, other than the first examiner shall revaluate the answer script(s).

12. MINIMUM INSTRUCTION DAYS

The minimum instruction days for each semester shall be 90 working days.

13. There shall be no branch transfer after the completion of admission process.

14. WITHHOLDING OF RESULTS

If the student has not paid the dues, if any, to the college or if any case of indiscipline is pending against him, the result of such student will be kept withheld. His degree will be withheld in such cases.

15. TRANSITORY REGULATIONS

Discontinued or detained candidates are eligible for readmission as and when next offered. A candidate, who is detained or discontinued in a semester, on readmission shall be required to do all the subjects in the curriculum prescribed for the batch of students in which the student joins subsequently. However, exemption will be given to those candidates who have already passed such subjects in the earlier semester(s) he was originally admitted into and substitute subjects are offered in place of them as decided by the Board of Studies. However, the decision of the Board of Studies will be final.

15.1. **A** student who is following JNTUK curriculum and detained due to shortage of attendance at the end of the first semester of first year shall join the autonomous batch of first year first semester. Such students shall study all the subjects prescribed for the batch in which the student joins and considered on par with regular candidates of Autonomous stream and will be governed by the autonomous regulations.

15.2. A student who is following JNTUK curriculum, detained due to lack of credits or shortage of attendance at the end of the second semester of first year or at the subsequent semesters shall join with the autonomous batch in the appropriate semester. Such candidates shall be required to pass in all the subjects in the program prescribed by the Board of Studies concerned for that batch of students from that semester onwards to be eligible for the award of degree. However, exemption will be given in the subjects of the semester(s) of the batch which he had passed earlier and substitute subjects will be offered in place of them as decided by the Board of Studies. The student has to clear all his backlog subjects up to previous semester by appearing for the supplementary examinations conducted by JNTUK for the award of degree will be sum of the credits up to previous semester under JNTUK regulations and the credits prescribed for the semester in which a candidate seeks readmission and subsequent semesters under the autonomous stream. The class will be awarded based on the academic performance of a student in the autonomous pattern.

15.3 **Transfer candidates (from non-autonomous college affiliated to JNTUK)**

A student who is following JNTUK curriculum, transferred from other college to this college in second year first semester or subsequent semesters shall join with the autonomous batch in the appropriate semester. Such candidates shall be required to pass in all the subjects in the program prescribed by the Board of Studies concerned for that batch of students from that semester onwards to be eligible for the award of degree. However, exemption will be given in the subjects of the semester(s) of the batch which he had passed earlier and substitute subjects are offered in their place as decided by the Board of Studies. The student has to clear all his backlog subjects up to previous semester by appearing for the supplementary examinations conducted by JNTUK for the award of degree. The total number of credits to be secured for the award of the degree will be the sum of the credits up to previous semester under JNTUK regulations and the credits prescribed for the semester in which a candidate joined after transfer and subsequent semesters under the autonomous stream. The class will be awarded based on the academic performance of a student in the autonomous pattern.

15.4 **Transfer candidates (from an autonomous college affiliated to JNTUK)**

A student who has secured the required credits up to previous semester as per the regulations of other autonomous institutions shall also be permitted to be transferred to this college.

A student who is transferred from the other autonomous colleges to this college in second year first semester or subsequent semesters shall join with the autonomous batch in the appropriate semester. Such candidates shall be required to pass in all the subjects in the program prescribed by the Board of Studies concerned for that batch of students from that semester onwards to be eligible for the award of degree.

However, exemption will be given in the subjects of the semester(s) of the batch which he had passed earlier and substitute subjects are offered in their place as decided by the Board of studies.

The total number of credits to be secured for the award of the degree will be the sum of the credits up to previous semester as per the regulations of the college from which he has transferred and the credits prescribed for the semester in which a candidate joined after transfer and subsequent semesters under the autonomous stream. The class will be awarded based on the academic performance of a student in the autonomous pattern.

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Academic Regulations (16) for B. Tech. (Lateral Entry Scheme)

(Effective for the students getting admitted into II year from the Academic Year 2017- 18 and onwards)

1. AWARD OF B. TECH. DEGREE

A student will be declared eligible for the award of the B. Tech. Degree if he fulfils the following academic regulations.

(a) Pursue a course of study for not less than three academic years and not more than six academic years counted from the academic year of admission.

(b) The candidate registers for 132 credits and secures all the 132 credits.

2. The attendance regulations of B.Tech (Regular) shall be applicable to B.Tech (LES), whereas the number of condonations is restricted to 3.

3. **PROMOTION RULE:**

(a) Attendance requirement is same as regular course.

(b) A lateral entry student will be promoted from II to III year if he puts up the minimum required attendance in II year II semester irrespective of credits earned.

(c) A student shall be promoted from III to IV year only if he fulfils the academic requirements of 50% of the credits up to III Year II semester from all the examinations, whether the candidate takes the examinations or not.

4. TRANSITORY REGULATIONS:

4.1 A student who is following JNTUK curriculum and detained due to shortage of attendance at the end of the first semester of second year shall join the autonomous batch of second year first semester. Such students shall study all the subjects prescribed for the batch in which the student joins and considered on par with Lateral Entry regular candidates of Autonomous stream and will be governed by the autonomous regulations.

4.2 A student who is following JNTUK curriculum, detained due to lack of credits or shortage of attendance at the end of the second semester of second year or at the subsequent semesters shall join with the autonomous batch in the appropriate semester. Such candidates shall be required to pass in all the subjects in the program prescribed by the Board of Studies concerned for that batch of students from that semester onwards to be eligible for the award of degree. However, exemption will be given in the subjects of the semester(s) of the batch of them as decided by the Board of Studies.

The student has to clear all his backlog subjects up to previous semester by appearing for the supplementary examinations conducted by JNTUK for the award of degree. The total number of credits to be secured for the award of the degree will be sum of the credits up to previous semester under JNTUK regulations and the credits prescribed for the semester in which a candidate seeks readmission and subsequent semesters under the autonomous stream. The class will be awarded based on the academic performance of a student in the autonomous pattern.

5. All the other regulations as applicable for B. Tech. Four- year degree course (Regular) will be applicable for B. Tech. (Lateral Entry Scheme).

MALPRACTICES RULES

DISCIPLINARY ACTION FOR / IMPROPER CONDUCT INEXAMINATIONS

➤ The Principal shall refer the cases of Malpractices in Internal Assessment Test and Semester end examinations to a malpractice prevention committee constituted by him for the purpose. Such committee shall follow the approved levels of punishment. The Principal shall take necessary action against the students based on the recommendations of the committee.

➤ Any action by the candidate trying to get undue advantage in the performance or trying to help another, or derive the same through unfair means is punishable according to the provisions contained hereunder:

	Nature of Malpractices/ Improper conduct	Punishment
	If the candidate:	
1(a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination).	Expulsion from the examination hall and cancellation of the performance in that subject only.
1(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled and sent to the college.
3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate, who has been

		impersonated, shall be cancelled in all the subjects of the examination (including practicals and to be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all college examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all college examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the Chief Superintendent/Assistant – Superintendent /any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the college	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s)has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.

	campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	
7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all college examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the college expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the college will be handed over to police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of

		that semester/year.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the college for further action to award suitable punishment.	

OTHER MATTERS:

1. Physically challenged candidates who have availed additional examination time and a scribe during their intermediate / EAMCET examinations will be given similar concessions on production of relevant proof / documents.

2. The Principal shall deal in an appropriate manner with any academic problem which is not covered under these rules and regulations, in consultation with the Heads of the departments and subsequently such actions shall be placed before the Academic Council for ratification. Any emergency modification of regulation, approved in the meetings of the Heads of the departments shall be reported to the Academic Council for ratification.

GENERAL:

1. The academic council may, from time to time, revise, amend or change the regulations, schemes of examinations and / or syllabi.

2. Where ever the words ''he'' ''him'' ''his'', occur in the regulations, they include ''she'', ''her'', ''hers''.

3. The academic regulation should be read as a whole for the purpose of any interpretation.

4. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the principal is final.

NARASARAOPETA ENGINEERING COLLEGE: NARASARAOPET (AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE STRUCTURE

I B.Tech – I SEMESTER COURSE STRUCTURE:

S.NO	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	Functional English	HS	4	-	-	40	60	100	3
2	Engineering Mathematics	BS	3	1	-	40	60	100	3
3	Engineering Physics	BS	3	1	-	40	60	100	3
4	Introduction to Computers and Problem Solving	ES	3	1	-	40	60	100	3
5	Engineering Graphics	ES	1	-	4	40	60	100	3
6	Environmental Studies	HS	4	-	-	40	60	100	3
7	Basic Communication Skills Lab	HS	-	-	3	25	50	75	2
8	Engineering Physics Lab	BS	-	-	3	25	50	75	2
9	IT – Workshop Lab	ES	-	-	3	25	50	75	2
	Total		18	3	13	315	510	825	24

II B.Tech – I SEMESTER COURSE STRUCTURE:

S.NO	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	Interactive English	HS	4	-	-	40	60	100	3
2	Mathematical Methods	BS	3	1	-	40	60	100	3
3	Engineering Chemistry	BS	4	-	-	40	60	100	3
4	C Programming	ES	3	1	-	40	60	100	3
5	Electronic Devices and Logic Design	ES	4	-	-	40	60	100	3
6	Integral Transforms and Vector Calculus	BS	3	1	-	40	60	100	3
7	Enhancing Communication Skills Lab	HS	-	-	3	25	50	75	2
8	Engineering Chemistry Lab	BS	-	-	3	25	50	75	2
9	C Programming Lab	ES	-	-	3	25	50	75	2
	Total		21	3	9	315	510	825	**24**

II B.Tech – I SEMESTER COURSE STRUCTURE:

S.NO	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	Mathematical Foundations of Computer Science	BS	3	1	-	40	60	100	3
2	Java Programming	ES	3	1	-	40	60	100	3
3	Data Structures	PC	3	1	-	40	60	100	3
4	Computer Organization	PC	4	-	-	40	60	100	3
5	Formal Languages and Automata Theory	PC	3	1	-	40	60	100	3
6	Business Management Concept for Engineers	HS	4	-	-	40	60	100	3
7	Data Structures Lab	PC	-	-	3	25	50	75	2
8	Java Programming Lab	ES	-	-	3	25	50	75	2
9	Quantitative Aptitude and Reasoning - I	MC	3	-	-	-	-	-	-
Total			**23**	**4**	**6**	**290**	**460**	**750**	**22**

II B.Tech – II SEMESTER COURSE STRUCTURE:

S. NO.	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	Statistical Programming with R	PC	3	1	-	40	60	100	3
2	Operating Systems	PC	4	-	-	40	60	100	3
3	Front End Web Technologies	PC	4	-	-	40	60	100	3
4	Database Management Systems	PC	3	1	-	40	60	100	3
5	Software Engineering	PC	4	-	-	40	60	100	3
6	Professional Ethics, Values and Patents	HS	4	-	-	40	60	100	3
7	Front End Web Technologies Lab	PC	-	-	3	25	50	75	2
8	Data Base Management Systems Lab	PC	-	-	3	25	50	75	2
9	Verbal Ability	MC	3	-	-	-	-	-	-
	Total		**25**	**2**	**6**	**290**	**460**	**750**	**22**

III B.Tech – I SEMESTER COURSE STRUCTURE:

S. NO	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	Design and Analysis of Algorithms	PC	3	1	-	40	60	100	3
2	OOAD through UML	PC	4	-	-	40	60	100	3
3	Compiler Design	PC	4	-	-	40	60	100	3
4	Computer Networks	PC	3	1	-	40	60	100	3
5	**Professional Elective – I** 1.Microprocessors and Multicore systems 2. Distributed Data Bases 3. Software Requirements & Estimation 4. Network Management Systems	PE	4	-	-	40	60	100	3
6	Operating Systems & Compiler Design Lab	PC	-	-	3	25	50	75	2
7	UML Lab	PC	-	-	3	25	50	75	2
8	Network & Unix Programming Lab	ES	-	-	3	25	50	75	2
9	Mini Project – I	PW	-	-	-	25	50	75	2
10	Quantitative Aptitude and Reasoning - II	MC	3	-	-	-	-	-	-
	Total		21	2	9	300	500	**800**	**23**

III B.Tech – II SEMESTER COURSE STRUCTURE:

S. NO.	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	Cryptography and Network Security	PC	4	-	-	40	60	100	3
2	Data Warehousing and Data Mining	PC	4	-	-	40	60	100	3
3	Advanced Java and Web Technologies	PC	4	-	-	40	60	100	3
4	**Professional Elective – II:** 1. Advanced Computer Architecture 2. E-Commerce 3. Software Development Methodology 4. Wireless Networks & Mobile Computing 5. Dot Net Technologies	PE	4	-	-	40	60	100	3
5	**Open Elective – I:** **(See the List of Open Electives)**	OE	4	-	-	40	60	100	3
6	Free Open Source Software (FOSS) Python Lab	PC	-	-	3	25	50	75	2
7	Advanced Java and Web Technologies Lab	PC	-	-	3	25	50	75	2
8	Data Mining Lab	PC	-	-	3	25	50	75	2
9	Mini Project- II	PW	-	-	-	25	50	75	2
10	Advanced Communication Skills	MC	3	-	-	-	-	-	-
	Total		22	-	9	300	500	800	**23**

IV B.Tech – I SEMESTER COURSE STRUCTURE:

S. NO.	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	Internet of Things	PC	4	-	-	40	60	100	3
2	Big Data Analytics	PC	4	-	-	40	60	100	3
3	**Professional Elective – III:** 1. Distributed Operating Systems 2. Business Intelligence 3. Software Testing Methodology 4. High Speed Networks	PE	4	-	-	40	60	100	3
4	**Professional Elective – IV:** 1. High Performance Computing 2. Machine Learning 3. Software Process and Project Management 4. Mobile Ad-hoc and Sensor Networks 5. Programming with Ruby	PE	4	-	-	40	60	100	3
5	**Open Elective – II (See the List of Open Electives)**	OE	4	-		40	60	100	3
6	Mobile Application Development Lab	PC	-	-	3	25	50	75	2
7	**Professional Skill based Lab** CCNA- I / Oracle DBA / SQL DBA	PC	-	-	3	25	50	75	2
8	IOT Lab	PC	-	-	3	25	50	75	2
9	Big Data Analytics Lab	PC	-	-	3	25	50	75	2
10	MOOCS	MC	-	-	-	-	-	-	-
	Total		20	-	12	300	500	800	**23**

IV B.Tech – II SEMESTER COURSE STRUCTURE:

S. NO.	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	**Professional Elective – V:** 1. Service Oriented Architecture 2. Pattern Recognition 3. Software Quality Assurance & Testing 4. Next Generation Networks 5. Artificial Intelligence	PE	4	-	-	40	60	100	3
2	**Open Elective – III** **(See the List of Open Electives)**	OE	4	-	-	40	60	100	3
3	Practical Training / Internship	PW	-	-	-	40	60	100	3
4	Major Project	PW	-	-	-	60	140	200	10
	Total		8	-	-	180	320	**500**	**19**

LIST OF OPEN ELECTIVES

Open Elective – I	Department Offering the Subject	No.of periods per week		No.of Credits
Subject Title		**L**	**T**	
Elements of Mechanical Engineering (Other than ME)	ME	4	-	3
Material Science (Other than ME)	ME	4	-	3
Basic Electrical and Electronics Engineering (Other than EEE,ECE & ME)	EEE	4	-	3
Industrial Electronics (Other than EEE)	EEE	4	-	3
Principles of Signals, system & Communications (Other than ECE)	ECE	4	-	3
Automotive Electronics	ECE	4	-	3
Medical Electronics	ECE	4	-	3
Image Processing Algorithms and Analysis (Other than ECE)	ECE	4	-	3
Database Management Systems (Other than CSE & ECE)	CSE	4	-	3
Front End UI & Frame Work Tools (Other than CSE)	CSE	4	-	3
Principles of water quality management.	CE	4	-	3
Remote Sensing and GIS (other than CE).	CE	4	-	3

Open Elective – II	Department Offering the Subject	No.of periods per week		No.of Credits
Subject Title		L	T	
Nanotechnology	ME	4	-	3
Work Study	ME	4	-	3
Fundamentals of Electrical Energy(Other than EEE)	EEE	4	-	3
Linear Control Theory (Other than EEE & ECE)	EEE	4	-	3
Introduction to Microprocessors and Micro Controllers (Other than ECE & EEE)	ECE	4	-	3
Consumer Electronics	ECE	4	-	3
Internet of Things (IOT) (Other than CSE)	CSE	4	-	3
Web Technologies (Other than CSE)	CSE	4	-	3
Cloud Computing (Other than ECE)	CSE	4	-	3
OOPS through JAVA (Other than CSE & ECE)	CSE	4	-	3
Disaster Management	CE	4	-	3
Building Services (Other than CE).	CE	4	-	3

Open Elective – III	Department Offering the Subject	No.of periods per week		No.of Credits
Subject Title		**L**	**T**	
Operations Research (Other Than ME)	ME	4	-	3
Robotics	ME	4	-	3
Energy Audit, Conservation & Management (Other than EEE)	EEE	4	-	3
Non-Conventional Energy Resources (Other than EEE)	EEE	4	-	3
Introduction to embedded systems (Other than ECE)	ECE	4	-	3
Global Positioning System	ECE	4	-	3
Computer Networks (Other than CSE & ECE)	CSE	4	-	3
Web Animation and Interactivity Using Flash	CSE	4	-	3
Web Services	CSE	4	-	3
Water shed Management.	CE	4	-	3
Solid and Hazardous waste management (Other than CE).	CE	4	-	3

I B.TECH   I SEMESTER

I B.TECH. - I SEMESTER COURSE STRUCTURE

S.NO	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	Functional English	HS	4	-	-	40	60	100	3
2	Engineering Mathematics	BS	3	1	-	40	60	100	3
3	Engineering Physics	BS	3	1	-	40	60	100	3
4	Introduction to Computers and Problem Solving	ES	3	1	-	40	60	100	3
5	Engineering Graphics	ES	1	-	4	40	60	100	3
6	Environmental Studies	HS	4	-	-	40	60	100	3
7	Basic Communication Skills Lab	HS	-	-	3	25	50	75	2
8	Engineering Physics Lab	BS	-	-	3	25	50	75	2
9	IT – Workshop Lab	ES	-	-	3	25	50	75	2
	Total		18	3	13	315	510	825	24

I B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	-	-	40	60	100	3
FUNCTIONAL ENGLISH **(Common to All Branches)**							

COURSE OBJECTIVES:

- To enable the engineering students develop their basic communication skills in English for academic and social purposes.
- To equip the students with appropriate oral and written communication skills.
- To inculcate the skills of listening, reading and critical thinking.
- To integrate English Language learning with employability skills and training.
- To enhance the students' proficiency in reading skills enabling them meet the academic demands of their course

COURSE OUTCOMES:

Learners are able to

CO1 : Speak clearly, effortlessly, confidently and appropriately.

CO2 : Write coherently with acceptable accuracy, organizing ideas logically.

CO3 : Listen and read to comprehend different discourses and different genres of texts.

CO4 : The learner will be able to read and infer, analyze, predict, interpret and draw conclusions any printed text.

Teaching Methodology:

The methodology of teaching will be chalk and talk, PPT, audio-visual and activity based

UNIT-I
Hours of Instruction per unit: 8

HUMOUR: An Astrologer's Day

Objective: To criticize the superstitious beliefs of the people in the contemporary society. To make the learners understand that an astrologer is not trustworthy as he deceives the people by bewitching them in order to get some money. So we should not believe anyone by means of outward appearance.

Outcome: To students will develop rational thinking instead of believing blindly everything without reason.

- a. Vocabulary : Prefixes, Suffixes
  (www.englishhints.com, www.enchantedlearning.com, www.learnenglish.de/grammar/prefixtext.html)
- b. Grammar : Nouns, Pronouns, Articles
- c. Writing : Sentences structures

UNIT-II

Hours of Instruction per unit: 8

INSPIRATION: Building a New State

Objective: To make the students know the value of natural resources that are abundantly available in our country.

Outcome: Learner will understand the importance of the natural resources that are valuable in nature in order to develop our nation.

a.   Vocabulary   : Homophones, Homographs, Homonyms Synonyms & Antonyms and Commonly confused words
(http://www.magickeys.com/books/riddles/words.html)

b.   Grammar   : Finite verbs, Non-finite verbs & question tags

c.   Listening   : Main points & sub-points

d.   Writing   : Paragraphs, Note making, Expansion of Proverbs

UNIT-III

Hours of Instruction per unit: 8

SUSTAINABLE DEVELOPMENT: Water: The Elixir of Life
Objective: To inform the learner how precious the water is, as well as the advantages and the characteristics of water.

Outcome: The learner will understand that water is the elixir of life and it should not be wasted but should be utilized in a proper way.

a.   Vocabulary   : One Word Substitutes,
(http://www.pinnacle.edu.in/campusfiles/1826_campusFile_1.pdf)

b.   Grammar   : Tenses

c.   Listening   : Listening for the theme and gist

d.   Writing   : Official letters, Curricula vitae, Covering Letters

UNIT-IV
Hours of Instruction per unit: 8

RELATIONSHIPS: The Wood rose
Objective: To enlighten the learner the value of human relationships as we are social animals and the need to maintain good relationship with elders and senior citizens.

Outcome: The learner will come to know that the old people are not to be ignored but it is the duty of the children to consider the wishes, feelings, emotions, ideas and thoughts of the older generation.

a.   Vocabulary   : Phrasal verbs & idioms

b.   Grammar   : Subject verb agreement, Active and Passive voice, Prepositions

c.   Listening   : Listening for specific detail and information.

d.   Writing   : Official reports (Fundamentals of technical communication Pg No. 119-153)

UNIT-V
Hours of Instruction per unit: 8

SCIENCE AND HUMANISIM: Progress

Objective: to enable the learner grasp the negative aspect of scientific inventions which are responsible for the anti social activities of the present day.

Outcome: understand that Science and Technology is a double edged knife and must be used with discrimination

   a. Vocabulary   : collocations, Technical vocabulary, common errors in vocabulary

   b. Grammar   : conditional sentences, conjunctions, common errors in grammar

   c. Listening   : Listening for opinions and attitude.

   d. Writing   : Events and essays

UNIT-VI
Hours of Instruction per unit: 8

READING

Objective: To understand types and sub-skills of reading and apply techniques to improve reading speed.

Outcome: demonstrate reading speed and comprehend the gist of passage.

Intensive reading, Extensive reading, predicting the content, skimming, scanning, Inferring meanings: lexical and contextual.

TEXTBOOK:

1. Using English – Orient Black Swan Pvt.Ltd.Publishers

Reference Books:

2. Meenakshi raman, Sangeeta, Sharma *Fundamentals of technical communication*, Pg: 119-153 Oxford University Press, 2015

3. Rutherford, Andrea. J, *Basic Communication Skills for Technology.* Pearson, New Delhi. 2001

4. Raymond Murphy, *Murphy's English Grammar,* Cambridge University Press 2004

5. Meenakshi Raman, Sangeeta Sharma, *Technical Communication: English Skills for Engineers*, Oxford University Press, 2009

6. Michael Swan, *Practical English Usage,* Oxford University Press, 1996

Online Sources:

1. www.englishhints.com, www.enchantedlearning.com,
2. www.learnenglish.de/grammar/prefixtext.html
3. http://www.magickeys.com/books/riddles/words.html

I B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	0	40	60	100	3
ENGINEERING MATHEMATICS **(Common to All Branches)**							

COURSE OBJECTIVES:

- The course is designed to equip the students with the necessary mathematical skills and techniques that are essential for an engineering course

- The skills derived from the course will help the student from a necessary base to develop analytic and design concepts.

COURSE OUTCOMES:
Upon successful completion of the course, the students should be able to

CO1 : Solve ordinary differential equations of first, second and higher order.

CO2 : Learn basic concept of partial differentiation.

UNIT- I: ORDINARY DIFFERENTIAL EQUATIONS

Linear equations of first order, Bernoulli differential equation, exact equations, equations reducible to exact equations. Newton's Law of cooling, natural growth and decay, orthogonal trajectories.

UNIT-II: LINEAR DIFFERENTIAL EQUATIONS OF HIGHER ORDER

Definitions, Operator D, Rules for finding the complementary functions,Inverse operator, Rules for finding the particular integrals, Method of variation of parameters, Equations reducible to linear equations with constant coefficients. R-L-C circuits, Simple Harmonic motion.

UNIT – III: MEAN VALUE THEOREMS

Review on limits and continuity, Mean Value theorems (without proofs) Rolle's theorem, Lagrange's theorem, Cauchy's theorem, increasing and decreasing functions, Maxima and minima of function of single variable.

UNIT- IV: PARTIAL DIFFERENTION:

Function of two or more variables, Partial derivatives, Total derivatives, change of variables, Jacobian - functional dependence, Tailor's for Two variables. Maxima and Minima of functions of two variables, Lagrange method of undetermined multipliers.

UNIT- V: FIRST ORDER PARTIAL DIFFERENTIAL EQUATIONS
Formation of partial differential equation by elimination of arbitrary constants and arbitrary functions, solutions of first order linear (Lagrange's) equations.

UNIT- VI: HIGHER ORDER PARTIAL DIFFERENTIAL EQUATIONS
Solutions of Linear Partial differential equations with constant coefficients, Method of separations of Variables, One dimensional wave equation, One Heat equations.

TEXT BOOK :

1.Dr. B.S. Grewal "*Higher Engineering Mathematics*", 42nd Edition, Khanna Publishers, 2012.

REFERENCES:

1. N.P. Bali, Bhavanari Satyanarayana, Indrani Promod Kelkar, "*Engineering Mathematics*", University Science Press, (An Imprint of Lakshmi Publications Pvt., Ltd) New Delhi, 2012
2. Keryszig E, "*Advanced Engineering Mathematics*", 8th Edition, John Wiley, Singapore, 2001.
3. Ravish R Singh, Mukul Bhatt, "*Engineering Mathematics*" Fourth reprint, McGraw Hill Education Pvt., Lim.,
4. Greenberg M D, "*Advanced Engineering Mathematics*", 2nd Edition, Pearson Education, Singapore, Indian Print, 2003.
5. Peter V. O'Neil, *"Advanced Engineering Mathematics"*, 7th Edition, Cengage Learning, 2011.
6. Srimanta Pal and Suboth C. bhunia, *"Engineering Mathematics"*, oxford University Press, 2015.

I B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	0	40	60	100	3
ENGINEERING PHYSICS **(Common to All Branches)**							

COURSE OBJECTIVES:

Physics is the foundation subject to all engineering and through the study in engineering physics the main aim is blending a strong physics component with relevant engineering backgrounds that are usually necessary to work in areas such as semiconductor, optical technologies, mechanical, electrical, and civil engineering. The students will get their traditional undergraduate engineering education that has a broad foundation in mathematics, engineering sciences and technology. This program emphasizes problem solving skills and an understanding of engineering design to address the needs and challenges of the technology age and allow students to take a broad range of engineering careers.

COURSE OUTCOMES:

Students will be able to

CO1 :   Understand the difference between classical and quantum mechanics

CO2 :   Analyze and understand semiconductor technology and various types of lasers & optical fibers.

CO3 :   Knows the applications of ultrasonic's in engineering and medicine

CO4 :   Will recognize the experimental evidence of wave nature of light and interference in thin films, Diffraction grating and polarizer's in various fields.

CO5 :   Recognize the importance of lasers in various fields.

CO6 :   Learn the crystal structures and XRD techniques.

CO7 :   Realize about the various applications of semiconductors in engineering & technology.

UNIT-I

Interference: Introduction – Coherent Sources -Interference in thin films by reflection – Newton's rings – Principle – construction- determination of radius of curvature of plano convex lens.

Diffraction : Introduction – Fraunhofer diffraction - Fraunhofer diffraction at single slit- double slit (qualitative) – Diffraction grating – Grating spectrum

Polarization: Introduction – Types of Polarization – Double refraction – Quarter wave plate ad Half Wave plate

UNIT-II

Lasers: Introduction – Characteristics of lasers – Spontaneous and Stimulated emission of radiation – Einstein's coefficients – Population inversion – Ruby laser – Helium Neon laser- Applications

Fiber Optics: Introduction- Principle of optical fiber - Acceptance angle – cone - Numerical Aperture-Applications

UNIT-III

Crystallography : Introduction – Space lattice – Basis – Unit Cell – Lattice parameters – Bravais lattices – Crystal systems – Structures and packing fractions of SC,BCC and FCC.

X-Ray Diffraction Techniques: Directions and planes in crystals – Miller indices – Separation between successive (h k l) planes – Bragg's law.

UNIT – IV

Ultrasonic: Introduction – properties - Production of Ultrasonic waves –Piezo electric effect, Magnetostriction methods -Applications.

Acoustics: Introduction-Sound absorption-absorption coefficient-Reverberation Time-Sabine's formula-Eyring's formula

UNIT – V

Free electron theory: Classical free electron theory – Quantum free electron theory – Fermi dirac (analytical) and its dependence on temperature-Fermi energy-Density of states.

Quantum Mechanics: Introduction – Matter waves – Physical significance of wave function - Schrodinger Time Independent wave equations – Particle in a one dimensional potential box.

UNIT – VI

Band Theory of Solids: Bloch theorem (qualitative) – Kronig-Penny model - boundary conditions-origin of energy band formation in solids- concept of effective mass of electron and hole-classification of materials into conductors, semiconductors and insulators.

Semiconductor Physics: Introduction –Intrinsic, Extrinsic semiconductor and carrier concentrations – Fermi level in intrinsic and extrinsic semiconductors- Hall Effect.

TEXT BOOKS

1. Solid state Physics by A.J. Dekker (Mc Millan India Ltd)
2. A text book of Engineering Physics by M.N. Avadhanulu & P.G. Kshirasagar (S. Chand publications)
3. Engineering Physics by Palanisamy (Scitech Publishers)
4. Engineering Physics by M.R. Srinivasan (New Age international publishers)

REFERENCE BOOKS

1. Introduction to solid state physics by Charles Kittle (Willey India Pvt.Ltd)
2. Applied Physics by T. Bhimasenkaram (BSP BH Publications)
3. Applied Physics by M.Arumugam (Anuradha Agencies)
4. Engineering Physics by D.K.Bhattacharya (Oxford University press)
5. Engineering Physics by Mani Naidu S (Pearson Publications)
6. Engineering Physics by Sanjay D Jain and Girish G Sahasrabudhe (University Press)
7. Engineering Physics by B.K.Pandey & S. Chaturvedi (Cengage Learning)

I B.TECH-I SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	0	40	60	100	3
INTRODUCTION TO COMPUTERS AND PROBLEM SOLVING							

COURSE OBJECTIVE:

The course provides knowledge on the basic computer architecture and problem solving techniques.

COURSE OUTCOMES:

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

C01: Explain the working of key components of a computer system, evaluation of computers and the working of various input-output devices.

C02: Find the working of the processor and the memory devices.

C03: Summarize the representation of numbers, alphabets and other character codes in computer system.

C04: Study the problem solving strategies and analyzing the algorithms and flow charts.

UNIT I

Introduction to Computers: What is a Computer? Characteristics of Computers, Generations of Computers, Classification of Computers, Basic Computer Organization, Applications of Computers.

Input and Output Devices: Input Devices, Output Devices.

UNIT II

Computer Memory and Processors: Introduction, Memory Hierarchy, Processor Registers, Cache Memory, Primary Memory, Secondary Storage Devices, Basic Processor Architecture.

UNIT III

Number Systems and Computer Codes: Binary Number System, Working with Binary Numbers, Octal Number System, Hexadecimal Number System, Working with Fractions, Signed Number Representation in Binary BCD Code, ASCII Code, Extended Binary Coded Decimal Interchange Code, Excess-3 Code, Gray Code, Unicode.

UNIT IV

Introduction to Computer Problem-Solving: Introduction, The Problem-Solving Aspect, Top-down Design, Implementation of Algorithms, Flow Charts, Programs Verification, The Efficiency of Algorithms, the Analysis of Algorithms.

UNIT V

Fundamental Algorithms: Introduction, Exchanging the Values of Two Variables, Counting, Summation of a Set of Numbers, Factorial Computation, sine Function Computation, Generation of the Fibonacci sequence, Reversing the Digits of an Integer, Base Conversion, Character to Number Conversion.

UNIT VI

Factoring Methods: Introduction, Finding the Square Root of a Number, The Smallest Divisor of an Integer, The Greatest Common Divisor of Two Integers, Generating Prime Numbers, Computing the prime Factors of an Integer.

Arrays: Introduction, Array Order Reversal, Array Counting or Histogramming, Finding the Maximum Number in a set, searching an element in an array.

TEXT BOOKS:

1. Fundamentals of Computers, Reema Thareja, Oxford .

2. How to solve it by Computer, R.G. Dromey, PHI .

REFERENCE BOOKS:

1. How to Design Programs, Matthias Fellesen, Robert Bruce Findler, Matthew Flatt, Shriram

Krishnamurthi, PHI .

2. Think like a Programmer, V.Anton Spraul, No Starch Press.

I B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	2	-	4	40	60	100	4
ENGINEERING GRAPHICS **(Common to CSE, ECE & EEE)**							

Course objectives:

The course is mainly intended to

- Impart basic knowledge and skills required to prepare engineering drawing which is an universal language of engineers for communication, designing and production
- Get enhanced imagination capacity, visualize and communicate geometrical elements
- Understand the fundamentals of geometry like engineering curves, planes, solids, sections, developments & isometric views and its applications in design and manufacturing of various engineering components

Course Outcomes:

At the end of this course student will acquire ability to

- Apply principles of drawing to represent dimensions of an object and use the different types of scales for drawing of various sizes of engineering curves
- Draw various polygons and Ellipse
- Draw Orthographic projections in 1st and 3rd angle projections
- Draw different orientations of points, lines, planes and solids with reference to principal planes.
- Draw orthographic views (2D) from the given isometric view (3D) and vice versa

UNIT-I

Introduction to engineering drawing: Importance, Drawing Instruments and their uses. Basics of Geometric construction.

Polygons: Construct the regular polygons using given length of a side, inscription of polygons and circumscription of polygons.

Ellipse- Arcs of circles Method and Oblong Method

Scales: Representation fraction-Construction of plain, diagonal and vernier scale.

UNIT-II

Orthographic projections: Principle of orthographic projections, first and third angle projections, projections of points.

Projection of Straight lines: parallel to both the planes, parallel to one plane and inclined to the other plane.

UNIT-III

Projection of Straight lines inclined to both the planes, determination of true length, angles of inclination and Traces.

UNIT-IV

Projections of planes: regular planes perpendicular/parallel to one plane and inclined to the other reference plane; inclined to both the reference planes.

UNIT-V

Projections of solids-prisms, pyramids, cones and cylinders with the axis inclined to one of the planes

UNIT-VI
Conversion of isometric views to orthographic views; Conversion orthographic views to isometric views

TEXT BOOKS:
1. Engineering Drawing by N.D. Butt, Chariot Publications
2. Engineering Drawing by K.L.Narayana & P. Kannaiah, Scitech Publishers.
3. Engineering Graphics by PI Varghese, McGrawHill Publishers

REFERENCE BOOKS:
1. Engineering Graphics for Degree by K.C. John, PHI Publishers
2. Engineering Drawing by Agarwal & Agarwal, Tata McGraw Hill Publishers

I B.TECH I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
ENVIRONMENTAL STUDIES **(Common to all Branches)**							

Course Objectives

1. To make the students aware about the environment and it's inter–disciplinary, Basic understanding of the ecosystem and its diversity.
2. Human development and societal development is inevitable. This development is entirely depends on science and Technological advancement through using resource assets of nature. In order to reduce the impacts of the technological development, the environmental studies creating awareness among the engineering graduates. So that we can have a healthy environment present and future.
3. Acquaintance on various environmental challenges induced due to unplanned anthropogenic activities.
4. The course covers the aspects like general awareness, Resources, Utilization and conservation, Healthy sustenance of life, pollution control, social aspects, etc. All these areas will provide and habituate the students towards conservation and sustainable development.
5. Overall understanding of the natural resources.

Course Outcomes

1. 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.
2. The knowledge about environmental studies is applicable as and when required like implementing any developmental activity can overcome the hurdles? In relation to environmental aspects.
3. Students can develop eco-friendly technologies for a healthy growth, and development of a nation which can prevent the environmental hazards by appropriate decisions and alternate remedies.
4. To make the students understand the adverse effects of environmental pollution, its causes and measures to control it.
5. The biodiversity of India and the threats to biodiversity and conservation practices to protect the biodiversity.
6. About environmental assessment and the stages involved in EIA and the environmental audit.

UNIT–I: Multidisciplinary nature of Environmental Studies

Definition, Scope and importance–Need for public awareness–Institutions and people in environment.

Ecosystems: Definitions and concepts–Characteristics of ecosystem–Structural and functional features–Producers, consumers, decomposers and food webs–Types of ecosystems–Forests, grassland, desert, crop land, pond, lake, river and marine ecosystems–Energy flow in the ecosystem–Ecological pyramids–Ecological successions.

UNIT–II: Natural resources:

Forest resources: Use and over–exploitation–Deforestation–Water resources–Use and over utilization of surface and natural resourced ground water–Floods and droughts–Conflicts over water–Dams, benefits and problems on tribal population & Environment.

Mineral resources: Use and exploitation–Environmental effects of extracting and using mineral resources.

Food resources: World food problems–Changes caused by agriculture and overgrazing–Effects of modern agriculture–Fertilizer and pesticide problems–Water logging, salinity–Concept of sustainable agricultural methods.

Land resources: Land as a resource–Land degradation, man induced landslides–Soil erosion and desertification.

UNIT–III: Biodiversity and its Conservation

Levels and Values of biodiversity–India as a mega diversity nation–Hotspots–Threat and conservation of biodiversity–Assessment of biodiversity and its impact on Environment.

UNIT–IV: Environmental Pollution and control

Definition, Cause, effects and control measures of

a. Air pollution

b. Water pollution

c. Soil pollution

d. Noise pollution

UNIT–V: Global environmental problems and global efforts

Climate change–Global warming–Acid rain–Ozone layer depletion–Nuclear accidents and holocaust–Rain water harvesting–Traditional and modern techniques–Environmental legislation–Wasteland reclamation–Consumerism and waste products.

UNIT–VI: Environmental Management

Impact Assessment and its significance–various stages of EIA–Preparation of EMP and EIS–Environmental audit–Ecotourism. The student should submit a report individually on any issues related to environmental studies course and make a power point presentation.

Text Books:

1. *An Introduction to Environmental Studies* by B. Sudhakara Reddy, T. Sivaji Rao, U. Tataji & K. Purushottam Reddy, Maruti Publications.
2. Anubha Kaushik & C.P. Kaushik. **2014**, *Environmental Studies, Fourth edition*, New Age International (P) Ltd., New Delhi.

References:

1. *Text Book of Environmental Studies* by Deekshita Dave & P. Udaya Bhaskar, Cengage Learning.
2. *Environmental Studies* by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada.
3. *Text Book of Environmental Sciences and Technology* by M. Anji Reddy, BS Publications.
4. Bharucha, E. **2005**, *Text book of Environmental Studies*, First edition, Universities Press (India) Pvt., Ltd., Hyderabad.

5. Dr. S. Keerthinarayana & Dr. C. Daniel Yesudian. **2004**, *Principles of Environmental Scienceand Engineering, First edition*, Anuradha Publications (P) Ltd., Kumbakonam.
6. P. Anandan & R. Kumaravelan. **2010**, *Environmental Science & Engineering, Sixth reprint*, Scitech Publications (India) (P) Ltd., Chennai.
7. Dr. Surinder Deswal & Dr. Anupama Deswal. **2008-09**, A *Basic Course in Environmental Studies, Second revised edition*, Dhanpat Rai & Co (P) Ltd., New Delhi.

I B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	-	-	3	25	50	75	2

BASIC COMMUNICSTION SKILLS LAB
(Common to All Branches)

COURSE OBJECTIVES:
- To build confidence in the students to communicate effectively in English.
- To strengthen the oral communication to enable them to interact with the people in various social situations.
- To enable the learners develop better pronunciation through emphasis on word accent, intonation and Rhythm

COURSE OUTCOMES:
Learners should be able to
CO1 : Improve their basic communication skills to interact with peers and others in various social situations
CO2 : Speak English effortlessly with good pronunciation
CO3 : Take part in various conversations/discourses using the formal and informal expressions they have learned.

Unit-1
    a. Greeting, Introducing and Taking leave
    b. Pure Vowels

Unit-2
    a. Giving information and Asking for information
    b. Diphthongs

Unit-3
    a. Inviting, Accepting and Declining Invitations
    b. Consonants

Unit-4
    a. Commands, Instructions and Requests
    b. Accent and Rhythm

Unit-5
    a. Suggestions and Opinions
    b. Intonation

Text Book:

Strengthen Your Communication Skills – Maruthi Publications, 2013

Reference Books:

1. *Personality Development and Soft Skills* (Oxford University Press, New Delhi)
2. J.D.O Conner, *Better English Pronunciation*, Cambridge University Press 1980
3. T.Balasubramanian, *A Text Book of English Phonetics for Indian Students*, Macmillan, 1981
4. Sanjay Kumar, Pusph Latha, *Communication skills,* Oxford University Press 2005

I B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	-	-	3	25	50	75	2
ENGINEERING PHYSICS LAB **(Common to All Branches)**							

Course objective:

The main aim of the course is to acquaint the students with basic concepts in Engineering Physics using the following illustrative list of experiments.

Course out comes:

➢ These experiments in the laboratory are helpful in understanding important concepts of physics through involvement in the experiments by applying theoretical knowledge.

➢ It helps to recognize where the ideas of students agree with those accepted by physics and where they do not.

List of Experiments

1. Newton's rings –Radius of Curvature of Plano Convex Lens.

2. Determination of thickness of thin wire- Air wedge method

3. Determination of wavelength of a source-Diffraction Grating-Normal incidence

4. Determination of wavelength of Laser Source-single slit diffraction.

5. Determine the Numerical aperture of an optical fiber.

6. Determination of velocity of ultrasonic waves in liquids-ultrasonic interferometer.

7. Melde's experiment – Transverse and Longitudinal modes.

8. Determination of velocity of sound-Volume resonator

9. Verification of laws of vibrations in stretched strings -Sonometer.

10. Hall effect in semiconductors

11. Energy Band gap of a Semiconductor p - n junction.

12. Characteristics of Thermistor- Temperature coefficient

REFERENCES:

1. Engineering Physics Lab Manual by Dr.Y. Aparna & Dr.K.Venkateswarao (V.G.S.Book links).
2. Physics Practical Manual, Lorven Publications.

I B.TECH-I SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	-	-	3	25	50	75	2
IT WORKSHOP LAB							

COURSE OBJECTIVE: Enabling the student to understand basic hardware and software tools through practical exposure.

COURSE OUTCOME:

After completion of this course, the student should be able to

CO1: Understand the need of PC hardware components, applications and softwares.
CO2: Gain the knowledge of networks, internet and World Wide Web, Search engines, netiquette.
CO3: Install and use different software like Windows XP, Linux
CO4: Identify and fix the defective PC and software related issues.
CO5: Formalise with parts of windows word, excel, power point.
CO6: Practice on DOS, LINUX commands, analyse, write algorithm and draw flow chart for a given problem.

PC Hardware:

Identification of basic peripherals, assembling a PC, installation of system software like MS Windows, device drivers. Trouble shooting Hardware and Software some tips and tricks.

Internet & World Wide Web:

Different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet, web browsers, email, newsgroups and discussion forums. Awareness of cyber hygiene (protecting the personal computer from getting infected with the viruses), worms and other cyber-attacks.

Productivity tools: Crafting professional word documents; excel spread sheets, power point presentations and personal websites using the Microsoft suite of office tools.

PC Hardware

Task 1: Identification of the peripherals of a computer.

To prepare a report containing the block diagram of the CPU along with the configuration of each peripheral and its functions. Description of various I/O Devices.

Task 2: (Optional): A Practice on disassembling the components of a PC and assembling them to back to working condition.

Task 3: Examples of Operating Systems- DOS, MS Windows, Installation of MS windows on a PC

Task 4: Introduction to Memory and Storage Devices, I/O Port, Device Drivers, Assemblers, Compilers, Interpreters, Linkers, Loaders.

Task 5: Hardware Troubleshooting (Demonstration): Identification of a problem and fixing a defective PC (improper assembly or defective peripherals).

Software Troubleshooting (Demonstration): Identification of problem and fixing the PC for any software issues.

Internet & Networking Infrastructure

Task 6: Demonstrating Importance of Networking, Transmission Media, Networking Devices-Gateway, Routers, Hub, Bridge, NIC, Bluetooth technology, Wireless Technology, Modem, DSL, and Dialup Connection.

Orientation & Connectivity Boot Camp and Web Browsing: Students are trained to configure the network settings to connect to the Internet. They are trained to demonstrate the same through web browsing (including all tool bar options) and email access.

Task 7: Search Engines & Netiquette:

Students are enabled to use search engines for simple search, academic search and any other context based search (Bing, Google etc).Students are acquainted to the principles of micro-blogging, wiki, collaboration using social networks, participating in online technology forums.

Task 8: Cyber Hygiene (Demonstration) : Awareness of various threats on the internet. Importance of Security patch updates and Anti-Virus solution Ethical Hacking, Firewalls, Multi-factors authentication techniques including Smart card Biometrics and also practiced

Word

Task 9: MS Word Orientation:

Accessing, overview of toolbars, saving files, Using help and resources, rulers, formatting, Drop Cap, Applying Text effects, Using Character Spacing, OLE in Word, using templates, Borders and Colors, Inserting Header and Footer, Using Date and Time option, security features in word, converting documents while saving.

Task 10 : Creating Project : Abstract Features to be covered:-Formatting Styles, Inserting Table, Bullets and Numbering, Changing Text Direction, Cell alignment, footnote, Hyperlink, Symbols, Spell Check, Track Changes, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs.

Excel

Task 11: Using spread sheet features of EXCEL including the macros, formulae, pivot tables, graphical representations.

Creating Scheduler - Features to be covered:-Gridlines, Format Cells, Summation, auto fill, Formatting Text.

LOOKUP/VLOOKUP

Task 12: Performance Analysis: Features to be covered:-Split cells, freeze panes, group and outline, Sorting, Boolean and Logical operators, Conditional Formatting.

Power Point

Task 13: Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week includes:- PPT Orientation, Slide

Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows, Hyperlinks, Inserting –Images, Clip Art, Tables and Charts in PowerPoint.

Task 14: Focusing on the power and potential of Microsoft power point Helps them learn best practices in designing and preparing power point presentation. Topic covered during this week includes:- Master Layouts (slide, template and notes), Types of views (basic, presentation, slide slotter, notes etc), Inserting – Background , textures, Design Templates, Hidden slides, OLE in PPT.

UNIX Commands: PATH, man, echo, who, date, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, vi editor, du, df, mount, umount, find, ps, tail, head, sort, grep, egrep, fgrep, cut, paste, join, tee, tar

Algorithms
Task1: Write an algorithm to convert the binary number into decimal number

Task2: Write an algorithm to find the area and circumference of the circle.

Task3: Write an algorithm to find the factorial of the given number

Task4: Write an algorithm to generate fibonacci series

Task5: Write an algorithm to convert the Celsius into Fahrenheit

Flow Charts

Task1: Draw a flow chart to find whether the given number is palindrome or not.

Task2: Draw a flow chart to find roots of the quadratic equation.

Task3: Draw a flow chart to find whether the number is prime or not.

Task4: Draw the flow chart to find the Largest of three numbers.

Task5: Draw a flow chart to find whether a year is leap year or not.

TEXT BOOKS:

Faculty to consolidate the workshop manuals using the following references.

1. Computer Fundamentals, Anita Goel, Pearson
2. Scott Mueller's Upgrading and Repairing PCs, 18/e, Scott. Mueller QUE, Pearson, 2008

REFERENCE BOOKS:

1. Essential Computer and IT Fundamentals for Engineering and Science Students, Dr.N.B.Venkateswarlu.
2. Information Technology Workshop, 3e, G Praveen Babu, M V Narayana BS Publications.
3. Comdex Information Technology, Vikas Gupta, dreamtech.

I B.TECH   II SEMESTER

I B.TECH. – II SEMESTER COURSE STRUCTURE

S.NO	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	Interactive English	HS	4	-	-	40	60	100	3
2	Mathematical Methods	BS	3	1	-	40	60	100	3
3	Engineering Chemistry	BS	4	-	-	40	60	100	3
4	C Programming	ES	3	1	-	40	60	100	3
5	Electronic Devices and Logic Design	ES	4	-	-	40	60	100	3
6	Integral Transforms and Vector Calculus	BS	3	1	-	40	60	100	3
7	Enhancing Communication Skills Lab	HS	-	-	3	25	50	75	2
8	Engineering Chemistry Lab	BS	-	-	3	25	50	75	2
9	C Programming Lab	ES	-	-	3	25	50	75	2
	Total		21	3	9	315	510	825	**24**

I B.TECH-II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	-	-	40	60	100	3
INTERACTIVE ENGLISH **(Common to All Branches)**							

Course objectives:

- To enable the engineering students develop their basic communication skills in English for academic and social purposes.
- To equip the students with appropriate oral and written communication skills.
- To enhance the skills of listening, reading and critical thinking.
- To integrate English Language learning with training for employability skills.

Course Outcomes:

Learners are able to

1. Speak clearly, effortlessly, confidently and effectively.
2. Write coherently and flawlessly, organizing ideas logically.
3. Listen and read to comprehend different discourses and different genres of texts.

Teaching Methodology:

The methodology of teaching will be chalk and talk, PPT, audio-visual, and activity based

PART-I

COMMUNICATION SKILLS
Hours of Instruction per week: 8

PART-I Objectives:

1. Understand the significance of using formal language in communication and Identify different language patterns in communication.
2. Understand the importance of clarity and conciseness of writing.
3. To enhance word power and usage of lexicons among the learners.

PART-I Outcomes:

1. Apply Formal and Informal Language in office correspondence and real life situations.
2. Apply the Clarity, Conciseness and Formal language in E-mail writing, letter writing, report writing, paragraph writing and essay writing.
3. Use words in different contexts while speaking and decipher meaning of the words contextually while reading.

1. **Effective communication**

   a. Role and significance of communication

   b. Features of Human Communication

c. Process of Communication

d. Types of Communication, barriers to communication

2. **Oral Communication**

   a. Importance of Listening for effective communication

   b. Interpersonal communication

   c. Models of Interpersonal relationship development

   d. Styles of communication

   e. Persuasion techniques

   f. Telephone and Cell phone etiquette

3. **Written Communication**

   a. Paragraph writing b. Summaries c. Expansion of Proverbs d. Essay writing

   e. Report writing f. The scientific paper g. Letter writing   h. Letters of Complaint

   i. Request to complaint j. letters of inquiry and responses k. Resume writing l. Visumes

   m. statement of purpose n. E-mail

   (Fundamentals of technical communication Pg No. 119 - 153)

   Remedial English

a. Importance of vocabulary and grammar,	k. Adjectives
b. Homonyms, Homophone and Homographs	l. Prepositions
c. Synonyms and antonyms	m. Tense and aspect
d. One word substitutes	n. Suffixes
e. Idioms	o. Question tags
f. Words often confused	p. Prefixes
g. Subject-Verb agreement	q. Punctuation
h. active and passive voice	r. Common Errors
i. direct and indirect speech	s. Correction of common errors
j. Articles	

PART-2

READING FOR ENRICHMENT

PART-II Objectives:

To inspire the learners by giving the success stories of the various fields and teach them that achievement comes only after burning the midnight oil.

PART-II Outcomes:

The students will emulate the achievers and develop perseverance, determination, dedication and industry

1. APJ Abdul Kalam
2. An Interview with Microsoft CEO Satya Nadella
3. Azim Premji
4. Sachin Tendulkar
5. Sam Pitroda: The Knowledge Revolution
6. Indra Nooyi: http://www.thefamouspeople.com/profiles/indra-nooyi-6440.php

TEXTBOOK:

1. E Suresh Kumar, *Engineering English* –Orient Black Swan Pvt.Ltd.Publishers

REFERENCE BOOKS:
1. Raman, Meenakshi & Sangeetha Sharma. Technical Communication: *Principles and Practice.* Oxford University Press, New Delhi. 2011
2. Rutherford, Andrea. J *Basic Communication Skills for Technology*. Pearson, New Delhi. 2001
3. Raymong Murphy, *Murphy's English Grammar,* Cabridge University Press 2004
4. Meenakshi Raman, Sangeeta Sharma. *Technical Communication: English Skills for Engineers,* Oxford University Press, 2009
5. Meenakshi raman, Sangeeta Sharma, *Fundamentals of technical communication,* Oxford University Press, 2015

I B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	0	40	60	100	3
MATHEMATICAL METHODS **(Common to All Branches)**							

Course Objectives:
- The course is designed to equip the students with the necessary mathematical skills and techniques that are essential for an engineering student.

- The skills derived from the course will help the student from a necessary base to develop analytic and design concepts.

Course Outcomes:

Upon successful completion of the course, the students should be able to
- Solve simultaneous linear equations using matrix methods.
- Calculate Eigen values and Eigen vectors of matrices that are essential for vibration / design analysis.
- Understand the concept of Double and Triple integrals and their applications to calculations of areas, volumes.
- Understand the most basic numerical methods to solve simultaneous linear equations.

UNIT-I: LINEAR SYSTEMS OF EQUATIONS
Rank of a matrix - Echelon form, Normal form, Solution of linear systems, Direct Methods, Gauss elimination, Gauss Jordon and Gauss Seidal Methods. Solutions of linear simultaneous equations: LU decomposition.
Application: Finding the current in a electrical circuit

UNIT – II: EIGENVALUES AND EIGENVECTORS
Eigenvalues, Eigenvectors, Properties, Cayley - Hamilton Theorem, Quadratic forms, Reduction of quadratic form to canonical form, Rank, Positive negative definite, semi definite, index, signature.
Application: Finding powers and inverse of a square matrix using Cayley – Hamilton's Theorem.

UNIT-III: APPLICATION OF INTEGRATION AND MULTIPLE INTEGRALS:
Applications of Integration to Lengths, Volumes and Surface areas of revolution in Cartesian and Polar Coordinates. Multiple Integrals- double and triple integrals, Change of Variables, Change of order of Integration.

UNIT – IV: SOLUTION OF TRANSCENDENTAL EQUATIONS:
Introduction - Bisection Method – Method of False Position – Iteration Method – Newton-Raphson Method (One variable and Simultaneous Equations), Secant method.

UNIT – V: INTERPOLATION:

Introduction – Errors in Polynomial Interpolation – Finite differences – Forward Differences – central differences – Symbolic relations and separation of symbols. Differences of Polynomial – Newton's formulae for Interpolation – Interpolation with unevenly spaced points – Lagrange's Interpolation formula – Newton's Divided difference formula.

UNIT-VI: NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS
Solution by Taylor's series, Euler's Method, modified Euler's Method, Runge – kutta Method (fourth order only), R-K method for simultaneous differential equations, Trepezoidal rule, Simpon's $(1/3)^{rd}$ rule, Simpons's $(3/8)^{th}$ rule.

TEXT BOOK:
1. B.S.Grewal, Higher Engineering Mathematics, 42nd Edition, Khanna Publisher.

REFERENCES:
1. N.P. Bali, Bhavanari Satyanarayana, Indrani Promod Kelkar, "Engineering Mathematics", University Science Press, (An Imprint of Lakshmi Publications Pvt., Ltd) New Delhi, 2012.
2. V. Ravindranath and P. Vijayalaxmi, Mathematical Methods, Himalaya Publishing House.
3. Dean G Duffy, advanced Engineering Mathematics with MATLAB, CRC Press.
4. Erwyn Kreyszig, Advanced Engineering Mathematics, 9th Edition, wiley-India.
5. Srimanta Pal and Suboth C. bhunia, *"Engineering Mathematics"*, oxford University Press, 2015.
6. Steven C.Chapra, Raymond P.Canale "Numerical Methods for Engineers" Tata Mc-Graw Hill.

I B.TECHI-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	0	40	60	100	3
ENGINEERING CHEMISTRY **(Common to all Branches)**							

COURSE OBJECTIVES:

1. For prospective engineers knowledge about water used in industries and for drinking purpose is useful; hence chemistry of hard water, boiler troubles and modern methods of softening hard water are introduced.

2. Polymer chemistry may be one of the most relevant of the sub-disciplines of chemistry for the modern citizen. Very few consumer goods are made without a significant contribution from the spectacular applications of polymers. Modern materials depend on large variety of properties available from polymers. Not only is polymer chemistry eminently practical, it is also fascinating from an academic view point.

3. With the increase in demand, a wild variety of materials coming up. Some of them have excellent engineering properties and a few of these materials are introduced.

4. The basics for the construction of galvanic cells as well as some of the sensors used in instruments are introduced. Also if corrosion is to be controlled, one has to understand the mechanism of corrosion which itself is explained by electrochemical theory.

5. Fuels as a source of energy are a basic need in industry, particularly industries like thermal power stations, steel industry, fertilizer industry etc., and hence they are introduced.

6. Photochemistry is to understand the basic principles and types of photochemical reactions. To ensure that students have a good knowledge about photoenergy. To be aware with the significant applications of photochemistry in many life areas.

COURSE OUTCOMES

1. Water Technology deals with the processes and mechanisms that are required to manage the human water cycle. Its function is to provide continuous and sufficient quantities of safe palatable drinking water for both domestic and industrial consumers and dispose of the used water to prevent environmental damage and to protect public health.

2. The advantages and limitations of plastic materials and their use in design would be understood.

3. The students would be now aware of materials like naomaterials, fullerenes and their uses. Similarly liquid crystals, solar cells and cement are understood. The importance of green

synthesis is well understood and how they are different form conventional methods is also explained.

4. Able to apply operating principles and the reaction mechanisms of electrochemistry knowledge to analysis and design of batteries and fuel cells. Able to get knowledge on corrosion in order to protect the metals from the environment.

5. To be able to understand and perform the various characterization techniques of fuels and fuels which are used commonly and their economics, advantages and limitations are discussed.

6. To understand the basics of photochemistry, Law of absorption of light, limitation/deviation and applications of Lambert Beer's law, photochemical law, Jablonski's diagram, applications of photochemistry.

UNIT-I: WATER AND ITS INDUSTRIAL APPLICATIONS

Sources of water–Impurities of water–Hardness, types of hardness and its units–Estimation of hardness by EDTA method–Boiler troubles (Sludge and Scale, Priming and Foaming, Caustic embrittlement, Boiler corrosion)–Softening of water–Internal treatment methods– External treatment methods–(Lime–Soda, Zeolite and Ion exchange process)–Desalination of brackish water (Reverse osmosis and Electrodialysis)–Municipal water treatment methods–Problems on hardness and lime-soda process.

UNIT-II: POLYMER SCIENCE AND TECHNOLOGY

Introduction-Classification of polymers–Polymerization, types and mechanism of polymerization–Stereo regular polymers–Plastics–Thermoplastics and thermosetting plastics–Compounding of plastics–Preparation, properties and applications of Polyethylene, PVC, Bakelite and Polycarbonates–Rubbers and elastomers–Natural rubber, vulcanization–Synthetic rubbers (Buna–N, Buna–S, Thiokol rubber)–Applications–Fiber reinforced plastics, Conducting polymers and Biodegradable polymers.

UNIT-III: CHEMISTRY OF ADVANCED MATERIALS

Nanomaterials: Types–Preparation of carbon nanotubes and fullerenes–Properties and engineering applications
Liquid crystals: Types and engineering applications
Green Chemistry: Principles–Methods for green synthesis and applications
Cement: Preparation of Portland cement–Setting and hardening of cement
Solar Cells: Solar heaters–Photovoltaic cells–Solar reflectors

UNIT-IV: ELECTROCHEMICAL CELLS AND CORROSION

Galvanic cells–Single electrode potential–Reference electrodes–Electrochemical series–Batteries (primary, secondary and fuel cells)
Corrosion: Causes and effects of corrosion–Theories of corrosion (dry, chemical and electrochemical corrosion)–Factors effecting corrosion–Corrosion control methods–Cathode protection–Sacrificial anodic, Impressed current methods–Surface coatings–Methods of application on metals (Hot dipping, Galvanizing, Tinning, Cladding, Electroplating, Electroless plating)–Organic surface coatings–Paints–Constituents and their functions.

UNIT-V: FUELS AND COMBUSTION

Fuels–Introduction–Classification–Calorific value–HCV and LCV–Bomb calorimeter–Problems on calorific value (Theoretical and Experimental)–Coal–Proximate and ultimate analysis–Problems on analysis of coal–Petroleum–Refining–Cracking–knocking–Petrol–Synthetic petrol–Gaseous fuels–Natural gas–LPG, CNG–Junker's gas calorimeter–Combustion–Problems on air requirements–Rocket fuels.

Unit-VI: PHOTOCHEMISTRY

Photo-excitation of organic molecules–Jablonski Diagram–Laws of Photochemistry and quantum yield–Calorimetric analysis–Photochemical equilibrium–Photosensitization–Some examples of photochemical reactions–Chemistry of vision and other applications of photochemistry.

STANDARD BOOKS

1. Engineering Chemistry, P.C. Jain and M. Jain, Dhanpat Rai & Sons, Delhi.
2. A Textbook of Engineering Chemistry, Shashi Chawla, Dhanpat Rai & Sons, Delhi.
3. A Textbook of Engineering Chemistry, S.S. Dara, S. Chand & Co. New Delhi.
4. A Text Book of Engineering Chemistry, N.Y.S. Murthy, V. Anuradha, K. Rama Rao, Maruthi Publications.
5. Engineering Chemistry, B. Sivasankar, (**2010**), McGraw-Hill companies

REFERENCES

1. Engineering Chemistry, K. Sesha Maheswaramma and Mridula Chugh (**2013**), Pearson Publications.
2. A Textbook of Engineering Chemistry, Dr. Y. Bharati Kumari and Dr. Jyotsna Cherukuri, VGS Publications.
3. Text Book of Engineering Chemistry, R. Gopalan, D. Venkatappayya, Sulochana Nagarajan (**2011**), Vikas Publications.
4. Text Book of Engineering Chemistry, C. Parameswara Murthy, C.V. Agarwal, Adhra Naidu (**2006**) B.S. Publications.

I B.TECH-II SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	-	40	60	100	3
C PROGRAMMING							

COURSE OBJECTIVE:

This course is designed to provide a comprehensive study of the C programming language. It stresses the strengths of C, which provide students with the means of writing efficient, maintainable, and portable code. The nature of C language is emphasized in the wide variety of examples and applications.   To learn and acquire art of computer programming. To know about some popular programming languages and how to choose.

COURSE OUTCOMES:

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

C01: Describe and Summarize basic programming constructs required to write programs.

C02: Use control structures (if, if/else, switch, while, do/while, for), derived data types (arrays) and user defined data types.

C03: Implement modular programming using functions

C04: Interpret dynamic memory allocation using pointers and Organize data into files.

UNIT I

COMPUTER LANGUAGES: Machine, Symbolic and High-level languages.

BASICS OF C Programming: Structure of a C program, identifiers, data types and sizes. Constants, Variables, Operators, type conversion & casting, Expression evaluation, Program development steps, Creating and Running Programs.

UNIT II

SELECTION: If-else, nested if, Multi-way selection: switch.

ITERATIVE: Loops-while, do-while and for statements, break, continue, Looping applications: Summation, powers, smallest and largest.

ARRAYS: Arrays- concepts, declaration, definition, accessing elements, storing elements,1-D arrays, 2-D arrays & multidimensional arrays, array applications, Strings and Strings functions.

UNIT III

FUNCTIONS- MODULAR PROGRAMMINGS: functions, basics, categories, parameter passing, storage classes, user defined functions, standard library functions, recursive functions, header files, C Preprocessor directives, Passing arrays to functions.

UNIT IV

POINTERS: Pointers- concepts, initialization of pointer variables, pointers and function arguments, passing by address- dangling memory, address arithmetic, character pointers and functions, pointers to pointers and arrays, dynamic memory management functions, command line arguments.

UNIT V

ENUMERATED, STRUCTURE AND UNION TYPES: Derived types- structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, unions, typedef, bit-fields.

UNIT VI

FILE HANDLING: Text files and binary files, Formatted I/O, File I/O operations, random files.

TEXT BOOKS:

1. Programming in C, Reema Thareja, OXFORD .
2. The C programming Language by Dennis Richie and Brian Kernighan 2nd ed..

REFERENCE BOOKS:

1. Programming in ANSI C, Dr.E.Balaguruswamy, Tata McGraw-Hill Education.

2. Problem Solving and Program Design in C, Hanly, Koffman, 7th ed, PEARSON.

3. C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE.

4. Programming in C, Second Edition by Ashok N.Kamthane, Pearson.

I B.TECH-II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	-	40	60	100	3
ELECTRONIC DEVICES AND LOGIC DESIGN							

Pre requisites:

Basic Electrical Engineering, Network Analysis, Engineering Physics and Basics of Mathematics

COURSE OBJECTIVES:
1. To understand the concepts and phenomenon associated with semiconductor devices.
2. To make the student understand the basic principles and abstractions those are used to analyze and design electronic circuits (Filters, amplifiers, and oscillators).
3. To learn different number systems and their conversions, complement methods, logic gates, Boolean algebra, minimization of switching functions, K – map method, combinational logic circuits, and sequential logic circuits.

COURSE OUTCOMES:

Upon completion of the course, students will:
1. Identify different diodes; describe the operation & characteristics of various diodes.
2. Analyze the characteristics of BJT, JFET and MOSFET.
3. Illustrate various biasing Techniques for a transistor and understand different amplifiers and Oscillators.
4. Convert one number system to other.
5. Implement logic circuits and simplify logic expressions.
6. Design Combinational logic circuits through expressions.
7. Analyze the operation of various flip-flops.
8. Design different Registers and Counters.

UNIT I: Junction Diode Characteristics

Open circuited PN Junction, Forward and Reverse bias, V-I characteristics, Applications of Diode – Switch, Rectifiers (without and with filters), Zener Diode characteristics, Zener as voltage regulator, LED.

UNIT II: Transistors

BJT, Configuration of BJT, Input and Output Characteristics of CB, CE and CC Configuration, JFET and MOSFET Characteristics, Comparison between BJT, JFET and MOSFET

UNIT III: Amplifiers and Oscillators

Need for Transistor biasing, Transistor CE and CB Amplifiers, Barkhausen Criteria, Hartley Oscillator, Colpitt's Oscillator, RC Phase Shift Oscillator, Wein Bridge Oscillator and Crystal Oscillator

UNIT IV: Number Systems, Logic Gates and Boolean algebra

Binary, Octal, Decimal and Hexadecimal Number Systems, Conversion of Numbers from one Radix to another Radix, 1's Complement and 2's Complement. Basic Gates- AND, OR and NOT,

Universal Gates- NAND and NOR, EX-OR and EX-NOR Gates, De-Morgan's Laws, Minimization of Logic Functions using Boolean Theorems and Karnaugh map method

UNIT V: Combinational and Sequential Logic Circuits

Combinational: Design of Half Adder, Full Adder, Half Subtractor, Full Subtractor, Design of Decoders, Encoders, Multiplexers, Demultiplexers.

Sequential: Basic sequential logic circuits: Latch and Flip-Flop, Truth tables and excitation tables of RS, JK, T and D Flip-Flops

UNIT VI: Registers and Counters

Buffer Register, Control Buffer Register, Bidirectional Shift Registers, Universal Shift Registers. Synchronous Counter, Ripple Counter, Ring Counter, Modulus Counter

Text Books:

1. Electronic Devices and Circuits – J. Millman, C.C. Halkias, TMGH, 1998

2. Digital Design – M. Morris Mano, Pearson, 3rd Edition, 2009.

References:

1. Electronic Devices and Circuits Theory- Robert L. Boylestad and Louis Nashelsky, Pearson Education, 9th Edition, 2008

2. Fundamentals of Logic Design- Charles H. Roth, Jr, Thomson Learning, 5th Edition, 2005.

I B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	0	40	60	100	3
INTEGRAL TRANSFORMS AND VECTOR CALCULUS **(Common to All Branches)**							

Course Objectives:
- The course is designed to equip the students with the necessary mathematical skills and techniques that are essential for an engineering student.
- The skills derived from the course will help the student from a necessary base to develop analytic and design concepts.

Course Outcomes:
Upon successful completion of the course, the students should be able to
- Learn the technique of Laplace transform and apply it to solve differential equations.
- Learn the technique of Z-transform and apply it to solve difference equations.
- Extend the concept of integration to vector functions, understand the significance of the operators, gradient, divergence and curl.
- Understand Fourier series, integral, transforms and they are provided with practice in their application and interpretation in a range of situations.
- Find surface areas and Volumes of certain solids using Green, Stokes and Gauss divergence theorems.

UNIT –I: LAPLACE TRANSFORMATIONS
Laplace transform and its properties, Unit step function and unit impulse function, Transform of periodic functions, Transform of derivatives and integrals, Multiplication by t^n, division by t, evolutions of integrals by Laplace Transforms. Inverse Laplace Transformations. Introduction, Finding inverse transforms by the method of partial fractions, other methods of finding inverse Laplace Transforms, Convolution theorem(without proof), Solutions Initial and Boundary Value Problems.

UNIT –II: Z – TRANSFORMS
Introduction, properties, Damping rule, Shifting rule, Initial and Final value theorems, Inverse z-transform, Convolution theorem, Solutions of difference equations.

UNIT-III: VECTOR DIFFERENTIATION
Gradient, Divergence, Curl, Laplacian and second order operators, vector identities,
Equation of continuity, potential surfaces.

UNIT-IV: VECTOR INTEGRATION
Line integral, work done, potential function, area surface and volume integrals, vector integral theorems: Green's, Stoke's and Gauss Divergence theorems (without proof) and related Problems.

UNIT – V: FOURIER SERIES
Introduction, Euler's Formulae, Conditions for a Fourier expansion, Functions having points of Discontinuity, change of interval, even and odd functions, Half – range sine and cosine series.

UNIT – VI: FOURIER TRANSFORMS

Introduction, Definition, Fourier Integrals, Fourier Sine and Cosine Integral, Fourier Transforms, Fourier sine and cosine transforms, Finite Fourier transforms.

TEXT BOOK:

1. B.S.Grewal, Higher Engineering Mathematics, 42nd Edition, Khanna Publisher.

REFERENCES:

1. N.P. Bali, Bhavanari Satyanarayana, Indrani Promod Kelkar, "Engineering Mathematics", University Science Press, (An Imprint of Lakshmi Publications Pvt., Ltd) New Delhi, 2012.
2. B.V. Ramana, Higher Engineering Mathematics, Tata McGrawhill.
3. ErwynKreyszig, Advanced Engineering Mathematics, 9thEditiwiley-India.
4. Peter V. O'Neil, "Advanced Engineering Mathematics", 7th Edition, Cengage Learning, 2011.
5. Srimanta Pal and Suboth C. bhunia, *"Engineering Mathematics"*, oxford University Press, 2015.

I B.TECH-II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	-	-	3	25	50	75	2
ENHANCING COMMUNICATION SKILLS LAB **(Common to All Braches)**							

Course objectives:

1. To train the students to use language effectively in professional situations like group discussions, public speaking, presentations and interviews.
2. To make the students understand the importance of body language.
3. To develop positive attitude and soft skills to improve their employability quotient.
4. To expose the students to variety of a self-instructional, learner friendly, electronic media and stimulate intellectual faculties/resources

Course Outcomes:

Learners are able to

1. Give presentations and attend job interviews confidently.
2. Speak confidently in challenging situations.
3. Know the importance of Non-verbal communication and interpret nonverbal symbols
4. Face computer based competitive exams like GRE, TOFEL, and IELTS.

5. **Unit-1:** Body Language

6. **Unit-2:** Dialogues

7. **Unit-3:** Presentation Skills

8. **Unit-4:** Group Discussion

9. **Unit-5:** Interviews and Telephonic Interviews

10. **Unit-6:** Debates

Text Book:

Strengthen your Communication Skills by Maruthi Publications, 2013

Reference Books:

1. *Personality Development and Soft Skills* (Oxford University Press, New Delhi)

2. M Ashraf Rizvi, *Effective Technical Communication skills*, McGraw-Hill, 2005

3. Barun K Mitra, *Personality Development and Soft Skills,* Oxford University Press, 2011

4. Konar N, *Communication Skills for Professionals,* PHI Learning Private Limited, 2011

I B.TECH I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	-	-	3	25	50	75	2
ENGINEERING CHEMISTRY LABORATORY **(Common to all Branches)**							

Course Objectives:

- To provide students with practical knowledge of quantitative analysis of materials by classical and instrumental methods for developing experimental skills in building technical competence.

Course Outcomes:

On completion of this course, students will have the knowledge in,

- Carrying out different types of titrations for estimation of concerned in materials using comparatively more quantities of materials involved for good results, and

- Handling different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results.

List of Experiments

Introduction to chemistry laboratory–Molarity, Normality, Primary, Secondary standard solutions, Volumetric titrations, Quantitative analysis, Qualitative analysis etc.

Volumetric Analysis

1. Estimation of NaOH using standard HCl solution

2. Estimation of Mohr's salt using potassium dichromate ($K_2Cr_2O_7$) solution

3. Estimation of $CuSO_4$ using sodium thiosulphate ($Na_2S_2O_3$) solution.

Water Analysis

4. Determination of hardness of water sample by EDTA method

5. Determination of alkalinity of water sample

6. Determination of free chlorine in bleaching powder

7. Determination of turbidity of water sample

Conductometric Titrations

8. Conductometric titration between strong acid and strong base (HCl + NaOH)

9. Conductometric titration between mixture of acids and strong base (HCl and CH_3COOH + NaOH)

Food analysis

10. Estimation of Vitamin-C

Preparation of Polymeric Resins

11. Preparation of phenol formaldehyde resin

12. Preparation of urea formaldehyde resin

STANDARD BOOKS

1. Practical Engineering Chemistry by K. Mukkanti, etal, B.S. Publications, Hyderabad.
2. A text book on experiments and calculation Engg. S.S. Dara.
3. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications
4. Chemistry Practical Manual, Lorven Publications
5. Inorganic quantitative analysis, Vogel.

I B.TECH-II SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	-	-	3	25	50	75	2
C PROGRAMMING LAB							

COURSE OBJECTIVE:

The purpose of this course is to introduce to students to the field of language. The students will be able to enhance their analyzing and problem solving skills and use the same for writing programs in C.

COURSE OUTCOMES:

After completion of this C Programming Lab, students should be able to:

CO1: Study, analyse and understand logical structure of computer programming and different constructs to develop programs in C Language.

CO2: Know how to write, compile and debug programs in C Language.

CO3: Understand and analyse data types, typecasting and operator precedence.

CO4: Analyse the use of conditional and looping statements to solve problems associated with conditions and repetitions.

CO5: Explain and analyse simple data structures, use of pointers and dynamic memory allocation techniques.

CO6: Summarize the role of functions involving the idea of modularity, know how to create files and apply file I/O operations.

Exercise l

a) Write a C Program to calculate the area of triangle using the formula Area = (s (s-a) (s-b) (s-c)) 1/2 where s= (a+b+c)/2.

b) Write a C Program to find the largest of three numbers using ternary operator.

c) Write a C Program to swap two numbers without using a temporary variable.

Exercise 2

a) Write a C program to find the roots of a quadratic equation.

b) Write a C program, which takes two integer operands and one operator form the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement).

Exercise 3

a) Write a C program to find the sum of individual digits of a positive integer and find the reverse of the given number.

b) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

Exercise 4

a) Write a C Program to print the multiplication table of a given number n up to a given value, where n is entered by the user.

b) Write a C Program to enter a decimal number, and calculate and display the binary equivalent of that number.

c) Write a C Program to check whether the given number is Armstrong number or not.

Exercise 5

a) Write a C program to interchange the largest and smallest numbers in the array.

b) Write a C program to input two m x n matrices, check the compatibility and perform addition and multiplication of them.

Exercise 6

a) Write a C Program to find both the largest and smallest number of an array of integers

b) Write a C Program to find transpose of a matrix.

Exercise 7

Write C programs that use both recursive and non-recursive functions for the following

i) To find the factorial of a given integer.

ii) To find the GCD (greatest common divisor) of two given integers.

Exercise 8

Write a C Program for the following.

i) To find Fibonacci sequence

ii) Write C programs illustrating call by value and call by reference concepts.

Exercise 9

Write C Programs for the following string operations without using the built in functions - to concatenate two strings

 a) To append a string to another string

 b) To compare two strings

Exercise 10

Write C Programs for the following string operations without using the built in functions

a) To find the length of a string

b) To find whether a given string is palindrome or not

Exercise 11

Write a C program that uses functions to perform the following operations:

i. To insert a sub-string in to given main string from a given position.

ii. To delete n Characters from a given position in a given string.

iii. To replace a character of string either from beginning or ending or at a specified location

Exercise 12

a) Write a C Program to Implement Taylor series method

b) Write a C Program to Implement Euler's method

c) Write a C Program to Implement Runge Kutta method

Exercise 13

a) Write a C program to implement a linear search.

b) Write a C program to implement binary search

c) Write a C program to implement sorting of an array of elements.

Exercise 14

a) Write C Program to reverse a string using pointers

b) Write a C Program to compare two arrays using pointers

c) Write a C program to swap two numbers using pointers

Exercise 15

Examples which explores the use of structures, union and other user defined variables

Exercise 16

a) Write a C program which copies one file to another.

b) Write a C program to count the number of characters and number of lines in a file.

c) Write a C Program to merge two files into a third file. The names of the files must be entered using command line arguments.

* At the end of the semester the student has to submit a Mini-Project on Computer Programming. The list of Mini-Projects is available in the department.

TEXT BOOKS:

1. Programming in C, Reema Thareja, OXFORD .
2. The C programming Language by Dennis Richie and Brian Kernighan 2nd ed..

REFERENCE BOOKS:

1. Programming in ANSI C, Dr.E.Balaguruswamy, Tata McGraw-Hill Education.

2. Problem Solving and Program Design in C, Hanly, Koffman, 7th ed, PEARSON.

3. C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE.

4. Programming in C, Second Edition by Ashok N.Kamthane, Pearson.

II B.TECH   I SEMESTER

II B. Tech. - I SEMESTER COURSE STRUCTURE

S. NO.	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	Mathematical Foundations of Computer Science	BS	3	1	-	40	60	100	3
2	Java Programming	ES	3	1	-	40	60	100	3
3	Data Structures	PC	3	1	-	40	60	100	3
4	Computer Organization	PC	4	-	-	40	60	100	3
5	Formal Languages and Automata Theory	PC	3	1	-	40	60	100	3
6	Business Management Concept for Engineers	HS	4	-	-	40	60	100	3
7	Data Structures Lab	PC	-	-	3	25	50	75	2
8	Java Programming Lab	ES	-	-	3	25	50	75	2
9	Quantitative Aptitude and Reasoning	MC	3	-	-	-	-	-	-
Total			**23**	**4**	**6**	**290**	**460**	**750**	**22**

II B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	0	40	60	100	3
MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE							

COURSE OBJECTIVE:

The course provides with the basic mathematical implication for computer science, applications of mathematics in computer science.

COURSE OUTCOMES:

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

CO1 : Acquire knowledge on statements, inferences, predicates.

CO2 : Perform operations on discrete structures such as sets, functions and relations

CO3 : Understand graphs and trees and their representation, types and variants and understand the algebraic structures, group theory, and Binomial theorem.

CO4 : Solve problems involving recurrence relations and generating functions.

SYLLABUS:

UNIT - I
Mathematical Logic: Statements and Notation, Connectives and Truth Tables-Negation, Conjunction, Disjunction, Conditional Statements, BiConditional Statements, Well-formed Formulas, Tautologies, Equivalence Formulas, Duality Law, Tautological Implications, Functionally Complete Set of Connectives, Other Connectives; Normal Forms, Theory of Inference for Statement Calculus.

UNIT - II
Predicate calculus: Predicates and Quantifiers-Predicates, Statement Function, Variables and Quantifiers, Free Bound Variables; Inference Theory of Predicate Calculus, Exercises.
Mathematical Induction: Principle of Mathematical Induction, Exercises.

UNIT - III

Set Theory and Relations: Set Theory, Principle of Inclusion and Exclusion, Relations, Relation Matrix and Digraph, Equivalence Relations, Covering and Partition of a Set, Compatibility and Partial Ordering Relations.

Functions: Bijective Functions, Types of Functions, Composition of Functions, Inverse Functions, Permutation Functions, Recursive Functions.

UNIT - IV

Graph Theory – I: Basic Concepts of Graphs, Sub graphs, Isomorphism, Paths and Circuits, Eulerian and Hamiltonian Graphs, Representation of graphs. (Problems and Theorems without proofs)

Graph Theory – II: Planar Graphs, Euler's Formula, Graph Coloring and Covering, Chromatic Number. (Problems and Theorems without proofs)

Trees: Trees and their Properties, Isomorphism of Trees, Directed trees, Binary Trees, Decision Trees, Spanning Trees-Properties, Algorithms for Spanning trees and Minimum Spanning Tree.

UNIT - V

Lattice: Lattices, Algebraic Systems, Properties of Binary operations, Semi groups and monoids, Groups.

Combinatorics: Basic Counting Principles, Permutations and Combinations- Permutations, Combinations, Pigeonhole Principle and its Application, Restricted Combinations.

Binomial Theorem: Binomial and Multinomial Coefficients, Generating Functions of Permutations and Combinations, Principle of Inclusion and Exclusion.

UNIT - VI

Recurrence Relation: Generating Function of Sequences, Partial Fractions, Calculating Coefficient of Generating Functions, Recurrence Relations, Formulation as Recurrence Relations, Solving linear homogeneous recurrence Relations by substitution, generating functions and The Method of Characteristic Roots, Solving Inhomogeneous Recurrence Relations.

TEXT BOOKS:

1. Mathematical Foundation for Computer Science, S.Santha, E.V. Prasad, T. U. Series First Edition, Cengage Learning, 2011 (Units: I, II, III, IV & V).
2. Discrete Mathematics for Computer Scientists & Mathematicians, 2/e, Mott, Kandel, Baker, PHI, 2003 (Units: IV, V & VI)

REFERENCE BOOKS:

1. Discrete Mathematical Structures with Applications to Computer Science, Tremblay, Manohar, 1/e, TMH, 1997.
2. Discrete Mathematics and its Applications with combinatorics and graph theory, 7/e, Rosen, TMH, 2012.

ADDITIONAL RESOURCES:

1. nptel.ac.in/courses/106106094

2. nptel.ac.in/courses/106108054 (Graph Theory)

II B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	0	40	60	100	3
JAVA PROGRAMMING							

COURSE OBJECTIVE:

The course provides fundamentals of object-oriented programming in Java and development of user interface.

COURSE OUTCOMES:

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

CO1 : Demonstrate his or her ability to understand the concept and underlying principles of Object-Oriented Programming.

CO2 : Problem-solving and programming skills using OOP concept.

CO3 : Solve real-world problems through software development in high-level programming language like Java.

CO4 : Creation of user interface with the help of AWT and Swings.

SYLLABUS:

UNIT - I
Introduction to OOP: Introduction, Need of Object Oriented Programming, Principles of Object-Oriented Languages - Classes, Objects, Abstraction, Encapsulation, Inheritance, Polymorphism; Procedural languages Vs. OOP, Applications of OOP, History of JAVA, Java Virtual Machine, Java Features ,Program structures, Installation of JDK1.8.

UNIT - II
Programming Constructs: Variables, Primitive Data types, Identifiers - Naming Conventions, Keywords; Literals, Operators - Binary, Unary and ternary; Expressions, Precedence rules and Associativity, Primitive Type Conversion and Casting, Flow of control - Branching, Conditional, loops.
Classes and Objects: Classes, Objects, Creating Objects, Methods - method types, method overloading; constructors - Parameterized Constructors, Constructor overloading; Cleaning up unused objects - Garbage collector, Finalization; Static keyword - static variables, methods, blocks; this keyword, Arrays, Recursion, Command line arguments and String handling.

UNIT - III

Inheritance: Types of Inheritance, Deriving classes using extends keyword, Method overriding, super keyword, final keyword, Abstract class.

Interfaces, Packages and Enumeration: Interface - Variables in interface, Extending interface; Interface vs. Abstract classes, Packages - Creating packages, using Packages, Access protection; Understanding CLASSPATH, java.lang package - Object class, Wrapper class, String class, String Buffer class ,String Builder class.

Exceptions & Assertions: Introduction, Exception handling techniques - try...catch, throw, throws, finally block; user defined exception

UNIT - IV

Multi-Threading: java.lang.Thread, Thread life cycle, The main Thread, Creation of new threads - by inheriting Thread class, Implementing the Runnable interface; Thread priority, Multithreading using isAlive() and join(), Synchronization - Synchronizing Methods, Statements; Suspending and Resuming threads, Communication between Threads.

Input/Output: reading and writing data - Byte Stream, Console, Character Stream, Buffered Byte Stream, Buffered Character Stream; java.io package.

UNIT - V

Applets: Applet class, Applet structure, An Example Applet Program, Applet Life Cycle , paint(),update() and repaint(), passing parameters to the Applet.

Event Handling: Introduction, Event Delegation Model, java.awt.event Description, Sources of Events, Event Listeners, Adapter classes, Inner classes

UNIT - VI

Abstract Window Toolkit: Why AWT?, java.awt package, Components and Containers, Button, Label, Checkbox, Radio buttons, List boxes, Choice boxes, Text field and Text area, container classes, Layouts, Menu, Scroll bar.

Swings: Introduction, JFrame, JApplet, JPanel, Components in swings, Layout Managers, JList, JScrollPane, SplitPane, JTabbedPane, Dialog box, Pluggable look and Feel.

TEXT BOOKS:

1. The Complete Reference Java, 8/e, Herbert Schildt, TMH, 2011 (UNITS : I, IV, V & VI)
2. Programming in JAVA, 2/e, Sachin Malhotra, Saurabh Choudhary, Oxford, 2014, (UNITS: I, II & III)

REFERENCE BOOKS:

1. JAVA Programming, K. Rajkumar,1/e, Pearson,2013.
2. Core JAVA, Black Book, Nageswara Rao, Wiley, 1/e, Dream Tech,2012.

ADDITIONAL RESOURCES: https://www.tutorialspoint.com/java/index.htm

II B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	0	40	60	100	3
DATA STRUCTURES							

COURSE OBJECTIVES:

1. Comprehensive knowledge of data structures and exposure to algorithmic complexities, recursive algorithms, searching , sorting and hashing techniques

2. Applying Stack and Queue techniques for logical operations

3. Understand Linked-list representation models in various types of applications

4. Implementation of tree in various forms, orientation on graphs, representation of graphs, graph traversals, spanning trees Graphs

COURSE OUTCOMES:

After the completion of this course the student should be able to understand,

CO1 : Analyze algorithms, Searching, Sorting and hashing Techniques

CO2 : Explain elementary data structures such as Stacks, Queues and linked lists

CO3 : Implement Trees and Advanced concepts of trees in various

CO4 : Design a variety of graph data structures and used in practical Applications

SYLLABUS:

UNIT - I
Introduction to Data Structures and Algorithms: Basic Terminology - Elementary Data Structure Organization, Classification of Data structures, Operations on Data structures, Abstract Data Type, Time and Space Complexity (worst-case, average-case, best-case). **Recursion**: Pseudocode, Factorial-A case study, Designing recursive algorithms, recursive examples, GCD implementation, Fibonacci numbers, Towers of Hanoi, Tail recursion.

UNIT - II
Searching and Sorting: Introduction to Searching, Linear Search, Binary Search, Introduction to Sorting, Bubble sort, Insertion sort, Selection sort, Merge sort, Quick sort, Heap sort.

Heaps: Binary Heaps-Inserting a new element in a Binary Heap, Deleting an element from a Binary Heap.

Hashing and Collision: Introduction, Hash Tables, Hash Functions, Different Hash Functions, Collisions;

UNIT - III
Stacks: Introduction to Stacks, Array Representation of Stacks, Operations on a Stack, Linked representation of Stacks, operations on a linked Stack, Applications of Stacks.
Queues: Introduction to Queues, Array Representation of Queues, Linked representation of Queues, Types of Queues (Circular Queues, Deques, Priority Queues), Applications of Queues.

UNIT - IV
Linked Lists: Introduction, Single linked list, Circular linked list, Doubly linked list.

UNIT - V
Trees: Introduction, Types of Trees (General Trees, Forests, Binary Trees, Expression Trees), Traversing a Binary Tree,
Efficient Binary Trees: Binary Search Trees, operations on Binary Search Trees (Searching for a node in Binary Search Tree, Inserting a new node in Binary Search Tree, Deleting a node from a Binary Search Tree), AVL Trees.

UNIT - VI
Graphs: Introduction, Graph Terminology, Directed Graphs, Representations of Graphs, (Adjacency Matrix Representation, Adjacency List Representation), Graph Traversal algorithms.

TEXT BOOKS:

1. Data Structures using C,Reema Thareja, Oxford, Second Edition, 2014.

   (UNITS: I, II, III, IV, V & VI)

2. Data Structures, Richard F, Gilberg , Forouzan, 2/e, Cengage, 2005. (UNIT: I)

REFERENCE BOOKS:

1. Data Structures and Algorithms, G.A.V.Pai, TMH, 2008.

2. Data structures and algorithm analysis in C, mark allen Weiss, 2/e, Pearson, 2002.

ADDITIONAL RESOURCES:

1. nptel.ac.in/courses/106102064/1

2. nptel.ac.in/courses/106103069

II B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
COMPUTER ORGANIZATION							

COURSE OBJECTIVES:

1. Comprehensive knowledge of computer system including the analysis and design of components of the system.

2. Gives an overview of representation of data.

3. Describes different parameters of a memory system, organization and mapping of various types of memories.

4. Illustrates algorithms for basic arithmetic operations using binary and decimal representation.

5. Describes the means of interaction of devices with CPU, their characteristics and operating modes.

COURSE OUTCOMES:

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

CO1 : Understand the computer system from user's perspective.

CO2 : Design of basic components of the system and illustrate data paths and control flow for sequencing in CPUs. Application of Micro operations and Microprogramming for design of control unit of CPU.

CO3 : Apply algorithms to perform arithmetic operations on binary representation of fixed and floating point data.

CO4 : Identify various types of memories, I/O interface devices.

SYLLABUS:

UNIT - I
Introduction: Types of Computers, Functional units of Basic Computer (Block diagram of Micro Computer).

Register Transfer and Micro-operations: Register Transfer language, Register Transfer, Bus and memory transfers - Three-State Bus Buffers, Memory Transfer; Arithmetic micro operations-

Binary Adder, Binary Adder _Subtractor, Binary Incrementer, Arithmetic Circuit; Logical micro operations- List of Logic Microoperations, Hardware Implementation, Some Applications; Shift micro operations-Hardware Implementation, Arithmetic logic shift unit.

UNIT - II
Basic Computer Organization and Design: Instruction codes – Stored Program Organization, Indirect Address, Computer Registers – Common Bus Systems, Computer instructions – Instruction Set Completeness, Timing and control, Instruction cycle – Fetch and Decode, Determine the Type of Instruction, Register Reference Instructions, 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, Control Flow Chart, Input – Output Instructions and Interrupt – Input – Output Configuration, Input-Output Instructions, Program Interrupt, Interrupt Cycle.

UNIT - III

Central Processing Unit: General Register Organization- Control Word, Examples of Micro-operations, STACK organization – Register Stack, Memory Stack, Reverse Polish Notation, Evaluation of Arithmetic Expressions, Instruction formats – Three Address Instructions, Two Address Instructions, One Address Instructions, Zero Address Instructions, RISC Instructions, Addressing modes – Numerical Example, Data Transfer and manipulation – Data Transfer Instructions, Data Manipulation Instructions, Arithmetic Instructions, Logical and Bit Manipulation Instructions, Shift Instructions, 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.
Micro Programmed Control Unit: Control memory, Address sequencing – Conditional Branching, Mapping of Instructions, Subroutines, Micro program example – Computer Configuration, Microinstruction Format, Symbolic Microinstructions, The Fetch Routine, Symbolic Microprogram, Design of control unit – Microprogram Sequencer.

UNIT - IV

The Memory System: Memory Hierarchy, Main memory - RAM and ROM Chips, Memory Address Maps, Memory Connection to CPU, Auxiliary memory – Magnetic Disks, Magnetic Tape, Associative Memory – Hardware Organization, Match Logic, Cache Memory – Associative Mapping, Direct Mapping, Set- Associative Mapping, Writing into Cache, Virtual Memory – Address Space and Memory Space, Address Mapping using Pages, Associative Memory Page Table, Page Replacement.

UNIT – V

Input-Output Organization: Peripheral Devices – ASCII Alphanumeric Characters, Input-Output Interface – I/O Bus and Interface Modules, I/O vs Memory Bus, Isolated vs Memory Mapped I/O, Example of I/O Interface, Asynchronous data transfer – Strobe Control, Handshaking, Asynchronous Serial Transfer, Modes of Transfer – Example of Programmed I/O, Interrupt Initiated I/O, Priority Interrupts – Daisy Chaining Priority, Parallel Priority Interrupt, Priority Encoder, Interrupt Cycle, Direct memory Access – DMA Controller, DMA Transfer.

UNIT – VI

Computer Arithmetic: Addition and subtraction – Addition and Subtraction with Signed Magnitude Data, Hardware Implementation, Hardware Algorithm, Addition and Subtraction with Signed 2's Complement Data, Multiplication Algorithms – Hardware Implementation for Signed Magnitude Data, Hardware Algorithm, Booth Multiplication Algorithm, Array Multiplier, Division Algorithms - Hardware Implementation for Signed Magnitude Data, Divide Overflow, Hardware Algorithm, Floating – point Arithmetic operations – Basic Considerations, Register Configuration, Addition and Subtraction, Multiplication, Division.

TEXT BOOKS:

1. Computer System Architecture, M. Morris Mano, Third Edition, Pearson.2008
   (UNITS: I, II, III, IV, V & VI).

REFERENCE BOOKS:

1. Computer Organization, Carl Hamacher, Zvonko Vranesic, Safwat Zaky, 5/e, McGraw Hill, 2002.
2. Computer Organization and Architecture, William Stallings, 6/e, Pearson, 2006.
3. Structured Computer Organization, Andrew S. Tanenbaum, 4/e, Pearson, 2005.
4. Fundamentals of Computer Organization and Design, Sivarama P. Dandamudi, Springer, 2006

ADDITIONAL RESOURCES:

1. nptel.ac.in/courses/106106092

2. nptel.ac.in/courses/106103068

II B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	0	40	60	100	3
FORMAL LANGUAGES AND AUTOMATA THEORY							

COURSE OBJECTIVES:

1. Introduce concepts in automata theory and theory of computation.
2. Identify different formal language classes and their relationships.
3. Design grammars and recognizers for different formal languages.
4. Prove or disprove theorems in automata theory using its properties.
5. Determine the decidability and intractability of computational problems.

COURSE OUTCOMES:

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

CO1 : Acquire a fundamental understanding of the core concepts relating to the theory of computation, formal languages, computational models including (but not limited to) decidability and intractability.

CO2 : Understand the functioning of Finite-State Machines, Deterministic Finite-State Automata, Nondeterministic Finite-State Automata Pushdown Automata and Turing Machines.

CO3 : To design grammars and automata (recognizers) for different language classes and able to prove and disprove theorems establishing key properties of formal languages and automata.

CO4 : To identify formal language classes and proves language membership properties.

SYLLABUS:

UNIT - I
Fundamentals of Automata: Computation, Finite State Machine, Examples Finite State Automata, Components of Finite State Automata, Elements of Finite State System, Mathematical representation of Finite State Machine, Automata Classification, Automata in Real World - Advantages of FSM, Disadvantages of FSM, Applications of FSM.

UNIT - II

Formal Language Theory: Symbols, Alphabets and Strings, Operations on Strings, Formal Languages, Operations on Languages.

Formal Languages / Grammar Hierarchy: Formal Grammar, Generative Grammars, Types of Generative Grammar, Formal Languages, Regular Language, Context-Free Language, Context-Sensitive Language, Recursive Language, Recursively Enumerable Language, Relationship between Grammars and Languages.

UNIT - III

Finite Automata: Introduction, Deterministic Finite Automata, Design of DFAs, Non Deterministic Finite Automata, Design of NFAs, Non-Deterministic Automata with ϵ-moves, Design of NFA- ϵ s, Advantages of Non-Deterministic Finite automata, NFA Versus DFA.

Equivalent Automata: Equivalent Finite-State Automata, Equivalence of NFA/NFA- ϵ and DFA, Equivalence of NFA - ϵ to NFA.

Transducers: Introduction, Moore Machine, Design of a Moore Machine, Mealy Machine Design of a Mealy Machine; Difference between Moore and Mealy Machines, Properties / Equivalence of Moore and Mealy Machines.

UNIT - IV

Minimization/ Optimization of DFA: Optimum DFA, Minimal DFA, 2DFA, DFA vs. 2DFA.

Regular Expressions and Languages: Regular Languages, Regular Expressions, Components of Regular Expression, Languages Associated with Regular Expression, Properties of Regular Expressions, Uses of Regular Expressions.

Finite Automata and Regular Expressions: Properties of Regular Sets or Regular Languages, Arden's Theorem, Equivalence of Finite Automata and Regular Expressions, Cycle of Constructions, Equivalence of DFA and Regular Expressions, Equivalence of NFA And Regular Expressions.

UNIT - V

Context-Free Grammars and Context-Free Languages: Types of Grammar, Ambiguous and Unambiguous Grammars, Relation between Regular Grammar and Finite Automata.

Simplification of Context - Free Grammar: Simplification of Context-Free Grammars, Elimination of ϵ - Productions, Elimination of Unit Productions, Normal Forms for Context Free Grammars, Chomsky Normal Form, Greibach Normal Form, Chomsky Vs. Greibach Normal Form, Application of Context-Free Grammars.

Push Down Automata: Definition, Model, Graphical notation, and Instantaneous descriptions, Acceptance of context free languages, Acceptance by final state and acceptance by empty Stack.

UNIT - VI

Turing Machine: Introduction, Components of Turing Machine, Description of a Turing Machine, Observations on TM, Elements of TM, Instantaneous description of TM, Moves of a TM, Language accepted by a TM, Role of TM's, Design of TM's, Undecidable Problem, P and NP Classes of Languages.

TEXT BOOKS:

1. A Text Book on Automata Theory, Nasir S.F.B, P.K. Srimani, 1/e, Foundation Publications Cambridge University Press, 2014. (UNITS: I, II, III, IV, V & VI).

2. Introduction to Automata Theory, Languages and computation, 3/e, John E. Hopcroft, Rajeev Motwani and Jeffrey D. Ullman, PEA, 2009. (UNIT- V)

REFERENCE BOOKS:

1. Introduction to Automata Theory, Formal Languages and Computation, Shamalendu Kandar, 1/e, Pearson, 2013.
2. Introduction to Theory of Computation, 2/e, Michel Sipser, CENGAGE, 2007.

ADDITIONAL RESOURCES:

1. nptel.ac.in/courses/106104028
2. nptel.ac.in/courses/106104148

II B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
BUSINESS MANAGEMENT CONCEPTS FOR ENGINEERS							

COURSE OBJECTIVE:

To equip student with the fundamental knowledge relating to economic principles, management concepts, fundamentals of the accounting.

COURSE OUTCOMES:

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

CO1 : Learn necessary skills relating to economics and production concepts.

CO2 : Equip with the basic principles of accounting which will be of help to know the fundamentals of accounting.

CO3 : Acquire necessary skills of management viz., Human Resource Management, Marketing Management etc.

CO4 : Acquaint the knowledge on project management.

SYLLABUS:

UNIT - I

Introduction To Managerial Economics: Definition, Nature and Scope- Relation with other Subjects; Demand- Definition, Determinants, Law of Demand and Its Exceptions, Concept of Elasticity of Demand, Demand Forecasting Techniques.

UNIT - II

Theory of Production and Cost Analysis: Production Function, Law of Variable Proportions, Economies of Scale, Cost Concepts, CVP Analysis (With Simple Problems)- Significance-Limitations; Introduction to Markets- Features of various market, Perfect competition, Monopoly and Oligopoly.

UNIT – III

Introduction to financial accounting: Definition, GAAP principles, Types of accounting, Double Entry System, Journal Entries, Ledger, Trail Balance, Income statement, Balance sheet, Final Accounts with Simple Adjustments.

UNIT - IV

Introduction to Management: Concept, Nature, Importance, Functions of Management, Henry Fayol's Principles of Management, F.W.Taylors Scientific Management, Douglas Mc Gregors Theory X and Y, Challenges of Management.

UNIT - V

Functional Areas of Management (1): Concept of HRM- Functions of HR Manager; Marketing Management-Functions of Marketing Manager; Financial Management- Functions of Financial Management; Production Management-Functions of Production Manager, Methods of Production- Job Production, Batch Production, Mass Production; Method Study, Inventory Management- ABC Analysis, EOQ Analysis.

UNIT – VI

Functional Areas of Management (2):

Project Management: (PERT / CPM): Development of Network, Difference between PERT and CPM, Problems on Critical Path, Problems on PERT Analysis, Concepts of Capital, Working Capital, Capital Budgeting.

TEXT BOOKS:

1. Dr. N. APPARAO Dr. P. Vijay Kumar: "Managerial Economics and financial analysis" Cengage publication's, New Delhi-2011.(UNIT- I,II,III)
2. Dr. A. R. Aryasri- Managerial Economics and Financial Analysis, TMH2011.(UNIT-I,II,III,VI)
3. Dr. P. Vijaya Kumar & Dr. N. Appa Rao," Managerial Science" cengage. Delhi,2012. (UNIT-IV,V,VI)

REFERENCES:

1. V. Maheswari: Managerial Economies, Sultan Chand.
2. Suma Damodaran: Managerial Economics, Oxford 2011.
3. Koontz & Weihrich: Essentials of Management" TMH 2011.
4. Hitt and Vijaya Kumar: Strategic Management, Cengage learning.

ADDITIONAL RESOURCES:

1. nptel.ac.in/courses/106102064/1
2. nptel.ac.in/courses/106103069

II B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	3	25	50	75	2
DATA STRUCTURES LAB							

COURSE OUTCOMES:

After the completion of this course the student should be able to

CO1 : Analyze algorithms, Searching, Sorting and hashing Techniques

CO2 : Explain elementary data structures such as Stacks, Queues and linked lists

CO3 : Implement Trees and graphs and used in practical Applications

LIST OF PROGRAMS:

Week - 1

a) Write a recursive C program which computes the nth Fibonacci number, for appropriate values of n.
b) Write recursive C programs for the following
    i)   Factorial of a given number
    ii)   GCD Computation
    iii)   Towers of Hanoi

Week - 2

a) Write a C program that use both recursive and non-recursive functions to perform linear search.
b) Write a C program that use both recursive and non-recursive functions to perform binary search.

Week - 3

a) Write a C program to implement Bubble sort.
b) Write a C program to implement Insertion sort.
c) Write a C program to implement Selection sort.

Week - 4

   a) Write a C program to implement Quick sort.
   b) Write a C program to implement Merge sort.
   c) Write a C program to implement Heap sort.

Week - 5

   a) Write a C program to implement Stack operations using arrays
   b) Write a C program to implement Queue operation using arrays.
   c) Write a C program to convert infix expression into postfix expression using Stack.

Week - 6

   a) Write a C program to implement Stack operation using Linked list.
   b) Write a C program to implement Queue operations using Linked lists.

Week - 7

Write a C program to implement the following operations on a singly linked using functions
   i) Insertion
   ii) Deletion
   iii) Displaying
   iv) Reversing

Week - 8

   a) Write a C program to store a polynomial expression in memory using linked list
   b) Write a C program to representation the given sparse matrix using arrays.

Week - 9

   a) Write a C program to implement following Operations on a Binary Tree
     i)   Create
     ii)   In-order traversal
     iii)   Pre-order traversal
     iv)   Post-order traversal

   b) Write a C program to implement following Operations a Binary Search Tree
     i)   Create
     ii)   Insert
     iii)   Delete

Week - 10

   a) Write a C program to compute the shortest path of a graph using Dijkstra's algorithm
   b) Write a C program to find the minimum spanning tree using Warshall's Algorithm

II B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	3	25	50	75	2
JAVA PROGRAMMING LAB							

COURSE OBJECTIVE:

The course provides user interface and application development program implementation using core java principles.

COURSE OUTCOMES:

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

CO1 : After the completion of this course the student must be able to demonstrate his or her ability to write, compile & execute basic java program and also the use of OOP concept i.e. data abstraction & data hiding, encapsulation, inheritance, polymorphism.

CO2 : Create and use interfaces, threads, handle exceptions and write applets.

CO3 : Knowledge of GUI for developing java components.

LIST OF PROGRAMS:

1. Write a JAVA program to display default value of all primitive data types of JAVA.

2. Write a JAVA program to display the Fibonacci sequence

3. Write a JAVA program give example for command line arguments.

4. Write a JAVA program to sort given list of numbers.

5. Write a JAVA program to search for an element in a given list of elements (linear search).

6. Write a JAVA program to search for an element in a given list of elements using binary search mechanism.

7. Write a JAVA program to determine multiplication of two matrices.

8. Write a JAVA program to sort an array of strings

9. Write a JAVA program to check whether given string is palindrome or not.

10. Write a JAVA program for call by value and call by reference.

11. Write a JAVA program to give the example for 'this' operator. And also use the 'this' keyword as return statement.

12. Write a JAVA program to demonstrate static variables, methods, and blocks.

13. Write a JAVA program using StringTokenizer class, which reads a line of integers and then displays each integer and the sum of all integers.

14. Write a JAVA program to give the example for 'super' keyword.

15. Write a JAVA program that illustrates simple inheritance.

16. Write a JAVA program to maintain Student Grading Database using multilevel inheritance. Student is Super class, which contains roll no, name, address. Marks derived from Student class, which contains subject names and respective marks. Result is derived from Marks class, which contains total, grade.

17. Write a JAVA program demonstrating the difference between method overloading and method overriding.

18. Write a JAVA program demonstrating the difference between method overloading and constructor overloading.

19. Write a JAVA program that describes exception handling mechanism.

20. Write a JAVA program for example of try and catch block. In this check whether the given array size is negative or not.

21. Write a JAVA program to illustrate sub class exception precedence over base class.

22. Write a JAVA program for creation of user defined exception.

23. Write a JAVA program to illustrate creation of threads using runnable interface (start method start each of the newly created thread. Inside the run method there is sleep() for suspend the thread for 500 milliseconds).

24. Write a JAVA program to create a class MyThread in this class a constructor, call the base class constructor, using super and starts the thread. The run method of the class starts after this. It can be observed that both main thread and created child thread are executed concurrently.

25. Write a JAVA program illustrating multiple inheritance using interfaces.

26. Write a JAVA program to create a package named p1, and implement this package in Ex class.

27. Write a JAVA program to create a package named mypack and import it in Circle class.

28. Write a JAVA program to create an abstract class named Shape, that contains an empty method named numberOfSides ().Provide three classes named Trapezoid, Triangle and

Hexagon, such that each one of the classes contains only the method numberOfSides (), that contains the number of sides in the given geometrical figure.

29. Write a JAVA program that describes the life cycle of an applet.

30. Write a JAVA program to create a border layout control.

31. Write a JAVA program to create a grid layout control.

32. Write a JAVA program to create a simple calculator.

33. Write a JAVA program that displays the x and y position of the cursor movement using Mouse.

34. Write a JAVA program that displays number of characters, lines and words in a text file.

35. Write a JAVA program that allows user to draw lines, rectangles and ovals.

II B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	0	0	0	0	0	0
QUANTITATIVE APTITUDE AND REASONING							

COURSE OBJECTIVES:

- To train students in analyzing real life scenarios considering all factors
- To educate the students on principles of mathematical problems and problem solving methods
- To train students for campus placements

COURSE OUTCOMES:

After thorough learning of Quantitative Aptitude and Reasoning, a student:

CO1 : Will be able to prepare well for clearing Quantitative Aptitude and Reasoning tests for campus placements

CO2 : Will be able to critically evaluate various real life situations by resorting to Analysis of key issues and factors.

CO3 : Will be able to demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.

CO4 : Will be able solve complex mathematical problems in the shortest time possible by applying shortcuts.

SYLLABUS

UNIT - I
Simple equations : Definition of Linear Equations, Formation of simple equations, Problems on Ages, Fractions and Digits, Indeterminate system of equations, Special cases in indeterminate system of equations

Ratio and proportion: Definition of Ratio, Properties of Ratios, Comparison of Ratios, Problems on Ratios Compound Ratio, Problems on Proportion, Mean proportional and Continued Proportion

Variation: Direct variation, Inverse variation, Joint variation, Problems on Variations

UNIT - II
Percentages: Introduction, Converting a percentage into decimals, Converting a Decimal into a percentage Percentage equivalent of fractions, Problems on percentages

Profit And Loss: Problems on Profit and Loss percentage, Relation between Cost Price and Selling price, Discount and Marked Price, Two different articles sold at same Cost Price, Two different articles sold at same Selling Price, Gain% / Loss% on Selling Price

Partnership: Introduction, Relation between capitals, Period of investments and Shares
Simple Interest: Definitions, Problems on interest and amount, Problems when rate of interest and time period are numerically equal.
Compound Interest: Definition and formula for amount in compound interest, Difference between simple interest and compound interest for 2 years on the same, principle and time period

Quadratic equations: General form of Quadratic equations, Finding the roots of Quadratic equations, Nature of the roots, Relation between the roots, Maximum and minimum value of Quadratic Expression.

Progressions: Arithmetic Progression, Geometric Progression, Harmonic Progression, Arithmetic Mean, Geometric Mean and Harmonic Mean and their relation.

UNIT - III
Deductions: Finding the conclusions using Venn diagram method, Finding the conclusions using syllogism method

Connectives: Definition of a simple statement, Definition of compound statement, Finding the Implications for compound statements, Finding the Negations for compound statements

UNIT - IV
Problems on Linear arrangement, Problems on Circular arrangement, Problems on Double line-up, Problems on Selections, Problems on Comparisons

UNIT - V
Clocks: Finding the angle when the time is given, Finding the time when the angle is known, Relation between Angle, Minutes and Hours, Exceptional cases in clocks

Calendars: Definition of a Leap Year, Finding the number of Odd days, framing the year code for centuries, Finding the day of any random calendar date.

Blood relations: Defining the various relations among the members of a family, Solving Blood Relation puzzles, solving the problems on Blood Relations using symbols and notations

TEXT BOOKS:

1. GL Barrons, Mc Graw Hills, Thorpe's verbal reasoning, LSAT Materials

2. R S Agarwal, S.Chand , 'A modern approach to Logical reasoning'

3. R S Agarwal, S Chand, 'Quantitative Aptitude'

4. Quantitative Aptitude - G. L BARRONS

5. Quantitative Aptitude - Abhijit Guha Mc Graw Hills

REFERENCES:

1. www.careerbless.com/**aptitude**/qa/home.php

2. www.affairscloud.com/**quantitative-aptitude**-questions

3. www.careerafter.com/rs-aggarwal-**quantitative-aptitude**-pdf/

4. www.amazon.in/**Quantitative-Aptitude**-Competitive-Examinations.../8121924987

5. www.indiabix.com

6. www.practice**aptitude**tests.com/numerical-**reasoning**-tests

ADDITIONAL RESOURCES:

1. nptel.ac.in/courses/106102064/1

2. nptel.ac.in/courses/106103069

II B.TECH   II SEMESTER

II B. Tech. - II SEMESTER COURSE STRUCTURE

S. NO.	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	Statistical Programming With R	BS	3	1	-	40	60	100	3
2	Operating Systems	PC	4	-	-	40	60	100	3
3	Front End Web Technologies	PC	4	-	-	40	60	100	3
4	Database Management Systems	PC	3	1	-	40	60	100	3
5	Software Engineering	PC	4	-	-	40	60	100	3
6	Professional Ethics, Values and Patents	HS	4	-	-	40	60	100	3
7	Front End Web Technologies Lab	PC	-	-	3	25	50	75	2
8	Database Management Systems Lab	PC	-	-	3	25	50	75	2
9	Verbal Ability	MC	3	-	-	-	-	-	-
Total			**25**	**2**	**6**	**290**	**460**	**750**	**22**

II B.TECH II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	0	40	60	100	3
STATISTICAL PROGRAMMING WITH R							

COURSE OBJECTIVE:

To acquaint students with the fundamental concepts of probability and statistics and to develop and implement the statistical programs using R.

COURSE OUTCOMES:

Upon Successful completion of the course, the students are able to

CO1 : Understand random variable, probability distributions and sampling theory.

CO2 : Acquire fundamental concepts of R programs.

CO3 : Understand and apply R programming structures and I/O.

CO4 : Calculating Statistical data using t-test and ANOVA one-way and two-way classifications.

SYLLABUS:

UNIT - I
Introduction of probability, Random variables – Discrete Random variables; Probability mass function; Binomial Distribution – The Mean and the variance of a Probability Distribution; Poisson Distribution, Continuous Random variables - Probability density function; The Normal Distribution - Calculating Normal Probabilities; Exponential Distribution, Uniform Distribution.

UNIT - II
Population and sample, Sampling distribution of the mean (σ known), Central Limit theorem (without Proof) and Problems , Sampling distribution of the mean(σ unknown), confidence Intervals(both Large and Samples).
Tests of Hypotheses (Introduction), Null hypotheses , Alternative hypotheses, Type –I and II errors, Level of significance.

UNIT - III
Introduction, how to run R, First R Sessions, Functions, and Data Types, Vectors.
Matrices& Arrays: Creating Matrices, General Matrix Operations, Adding and Deleting Matrix Rows and Columns, Naming Matrix Rows and Columns.
Lists: Creating Lists, General List Operations, Accessing List Components and Values, Applying Functions to Lists.

UNIT - IV
R Programming Structures: Control Statements, Loops - Looping Over Non vector Sets; If-Else, Arithmetic and Boolean Operators and values, Default Values for Argument, Return Values, functions with objects, No Pointers in R, Recursion, Replacement functions.

UNIT - V

Hypotheses concerning one mean (Small samples) - Inference concerning two means (Small samples) - Paired t-test; Hypotheses concerning two variance (F – test) - ANOVA one-way and two-way classifications.

UNIT - VI

Doing Math and Simulation in R: Math Function, Functions for Statistical Distributions,
Sorting, Linear Algebra Operation on Vectors and Matrices, Set Operation, Simulation Programming in R.
Input /output: Accessing the Keyboard and Monitor, Reading and writer Files.

TEXT BOOKS:

1. The Art of R Programming, Norman Matloff, Cengage Learning, 2011. (UNITS :

2. B. S. Grewal, "*Higher Engineering Mathematics*", 43rd Edition, Khanna Publishers, 2015. (UNITS : I, II, V)

3. Miller and John E. Freund's, "Probability and Statistics for Engineers", 7th edition, Pearson education, Prentice Hall of India, 2005.(UNITS : I, II, V)

REFERENCE BOOKS:

1. R Cookbook, PaulTeetor, Oreilly, 2011

2. R in Action, Rob Kabacoff, Manning, 2011

3. Probability, Statistics and Random Processes, Murugesan, Anuradha Publishers, Chennai, 2009.

ADDITIONAL RESOURCES:

1. nptel.ac.in/courses/106102064/1

2. nptel.ac.in/courses/106103069

II B.TECH II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
OPERATING SYSTEMS							

COURSE OBJECTIVE:

To gain knowledge about the Operating Systems concepts such as process, main memory management, secondary memory management, Deadlocks, CPU and disk scheduling etc.,

COURSE OUTCOMES:

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

CO1 : Understand and identify operating system structure and generations.

CO2 : Understand process management concepts, process synchronization and distinguish process scheduling algorithms.

CO3 : Distinguish various memory management techniques and know about the deadlock and recovery techniques.

CO4 : Compare and contrast various disk scheduling algorithms and recognize file system implementations.

SYLLABUS:

UNIT - I
Computer System and Operating System Overview: Overview of Operating System - What operating systems do, User view, System view, defining operating systems; Operating Systems functions- Process Management, Memory Management, Storage Management, File-System Management, Mass-Storage Management, Caching, Protection and security; Distributed systems, Special purpose systems, Real-Time Embedded Systems, Multimedia Systems, Handheld Systems, Operating Systems Structures, Simple Structure, Layered Approach, Micro Kernels, Modules; Systems Calls- Process control, File management, Device management, Information maintenance, Communication; Operating systems generation.

UNIT - II
Process Management: Process, Process States, Process Control Block, Process Scheduling-Scheduling Queues, Schedulers; Operations- Process Creation, Process termination; Inter process communication- Shared-Memory Systems, Message-Passing Systems, Naming, Synchronization, Buffering; Multi Thread programming models- Many to one, One to one, Many to Many model;
Process Scheduling Criteria- CPU scheduler, Preemptive scheduling, Dispatcher, Scheduling Criteria; CPU Scheduling Algorithms- First Come First Serve, Shortest job first, Priority Scheduling, Round robin scheduling.

UNIT - III

Concurrency: Process Synchronization, The Critical-Section Problem, Peterson's Solution, Synchronization Hardware. Semaphores- Usage, Implementation, Deadlock and Starvation; Classic Problems of Synchronization- Bounded buffer problem, Readers writers' problem, Dining-Philosophers problem; Monitors- Usage, Dining-Philosophers solution using monitors.

UNIT - IV

Memory Management: Swapping, Contiguous Memory Allocation- Memory Allocation, Fragmentation; Paging- Basic Method, Hardware Method, Protection, shared pages; Structure of the Page table- Hierarchical Paging, Hashed Page Tables. Segmentation- Basic Method, hardware.
Virtual Memory Management: Virtual Memory. Demand Paging- Basic concept, copy on write; Page-Replacement Algorithms- Basic page replacement, FIFO page replacement, optimal page replacement, LRU page replacement, LFU page replacement; Thrashing- Cause of Thrashing, Working set model, Page fault frequency

UNIT - V

Principles of Deadlock: Deadlock System Model. Deadlock Characterization- Necessary Conditions, Resource allocation graph; Deadlock Prevention- Mutual exclusion, Hold and wait, No preemption, Circular wait; Deadlock Detection and Avoidance- Resource allocation Graph algorithm, Banker's algorithm, Single instance of each resource type, several instances of each resource type; Recovery Form Deadlock- Process termination, Resource preemption

UNIT - VI

File System: The Concept of a File- file attributes, file operations, file types, file structures; Access Methods- sequential access, direct access, other access methods; Directory Structure- single level directory, two level directories, tree structured directory, general graph directory; File Sharing- multiple users, remote file systems; Protection- types of access, access control.
Implementing File System: File System Structure. File System Implementation- overview, partitions and mounting, virtual file systems; Allocation Methods- contiguous allocation, linked allocation, indexed allocation; Free-Space Management- linked list, grouping, counting.
Disk Scheduling- FCFS scheduling, SSTF scheduling, SCAN scheduling, C-SCAN scheduling, LOOK scheduling.

TEXT BOOK:
1. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7/e, John Wiley, 2016.

REFERENCE BOOKS:
1. Operating Systems – Internal and Design Principles Stallings, 6/e, Pearson Education, 2005.
2. Operating Systems – A Concept based Approach – D.M.Dhamdhere, 2/e, TMH, 2005.
3. Operating System a Design Approach-Crowley, 1/e, TMH, 2005.
4. Modern Operating Systems, Andrew S Tanenbaum 3/e, PHI, 2013.

ADDITIONAL RESOURCES:
1. nptel.ac.in/courses/106108101
2. nptel.ac.in/courses/106106144

II B.TECH II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
FRONT END WEB TECHNOLOGIES							

COURSE OBJECTIVE:

This course is designed to introduce students with no programming experience to the programming languages and techniques associated with the World Wide Web. The course will introduce web-based media-rich programming tools for creating interactive web pages.

COURSE OUTCOMES:

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

CO1 : Analyze a web page and identify its elements and attributes.

CO2 : Create interactive web pages using Cascading Styles sheets and java script.

CO3 : Design webpages using XML, XSLT, and HTML.

CO4 : Build dynamic web pages with JQuery.

SYLLABUS:

UNIT I:

HTML5: Fundamentals of Html, Working With Text, Organizing Text in Html, Working With Links and URLs, Creating Tables, Working With Images, Colors, and Canvas, Working With Forms, Interactive Elements, Working With Multimedia

UNIT II:

Cascading Style Sheets: Overview of Css3, Backgrounds and Color Gradients in CSS, Fonts And Text Styles, Creating Boxes and Columns Using CSS, Displaying, Positioning, And Floating An Element, List Styles, Table Layouts, Pseudo-Classes and Pseudo-Elements, Effects, Frames, and Controls in CSS, Implementing The Advanced Features of Html5

UNIT - III
Introduction to Java Script: General Syntactic Characteristics, Primitives, Operations and Expressions, Control Statements, **Objects in Java Script:** Object creation and modification, Arrays, Functions. **Dynamic HTML with Java Script:** Positioning elements, Moving Elements, Element Visibility, Changing colors and fonts, Dynamic Content, **Regular Expressions in Java Script:** Pattern matching using regular expressions, **Working with Events:** onload, onclick, onsubmit, onmouseover, onmouseout, onkeydown, onkeyup, onkeypress.

UNIT - IV
Working with XML:
Document type Definition: DTD Types, DTD Components, Built-in Entities, **XML schemas:** Type, Attributes, Restrictions, XSD complex types, XSD Complex indicators, **Document Object Model**: Navigation, Accessing, **XSLT:** Template, value-of, for-each, sort, if, choose, key, **DOM and SAX.**

UNIT - V
JQuery API:
Introduction: What jQuery can Do, Who Develops jQuery? Obtaining jQuery Installing jQuery, Programming Conventions, Markup and CSS Conventions, JavaScript Conventions, **Selecting and Filtering Elements:** Using the Selectors API, Filtering a Selection, Working within the Context of a Selection, Working with an Element's Relatives, Slicing a Selection, Adding to a Selection**, Events:** The Various Event Wrapper Methods, Attaching Other Events, Attaching Persistent Event Handlers, Removing Event Handlers, Creating Custom Events**, Manipulating Content and Attributes:** Setting, Retrieving, and Removing Attributes, Setting Multiple Attributes, Manipulating Class Names, Manipulating HTML and Text Content, Replacing Elements, Removing Content, Cloning Content**, Iteration of Arrays and objects:** Enumerating Arrays, Filtering Selections and Arrays, Mapping a Selection or an Array, Array Utility Methods.

UNIT - VI
JQuery UI:
Animations and Effects: Showing and Hiding Elements, Sliding Elements, Fading Elements, Custom Animation, Animation Options**, HTML5 Drag and Drop:** Implementing Drag and Drop, Implementing Drag-and-Drop File Uploads**, Sortable:** Making a List Sortable, Customizing Sortable, Saving the State of Sorted Lists**, Selectable, Accordion:** Building an Accordion UI, Changing the Default Pane, Changing the Accordion Event, Setting the Header Elements**, Date picker:** Implementing a Date picker, Localizing the Date picker**, Dialogue:** Implementing a Dialog, Styling a Dialog, Making a Modal Dialog, Auto-Opening the Dialog, Controlling Dynamic Interaction, Animating the Dialog, Working with Dialog Events**.**

TEXT BOOKS:
1. HTML 5 Black book, Dream Tech.,2011, (Unit I,II,III).
2. Web Technologies, Uttam K Roy, Oxford,2010 (Unit IV).
3. Web Development with JQuery, Richard York, Wiley publications**,** 2/e ,2015(Unit V,VI)

REFERENCE BOOKS:
1. Programming the World Wide Web, Robert W Sebesta, 7ed, Pearson, 2012
2. An Introduction to Web Design, Programming, Paul S Wang, Sanda S Katila, Cengage, 2003.

ADDITIONAL RESOURCES:

1. https://www.w3schools.com/
2. nptel.ac.in/courses/106105084/13
3. https://www.coursera.org
4. Learning Management System.

II B.TECH II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	0	40	60	100	3
DATABASE MANAGEMENT SYSTEMS							

COURSE OBJECTIVE:

Provides students with theoretical knowledge and practical skills in the design, use of databases and database management systems in information technology applications

COURSE OUTCOMES:

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

CO1 : Acquire knowledge in fundamentals of DBMS and identify the differences between traditional file system and DB systems.

CO2 : Understand various DBMS models and how queries are being processed and executed in RDBMS.

CO3 : Analyse DB design methodology and normalization process.

CO4 : Discuss the various transaction and concurrency management techniques and various files indexing techniques.

SYLLABUS:

UNIT - I
Introduction: Database system, Characteristics - Database vs. File System; Database Users - Actors on Scene, Workers behind the scene; Advantages of Data base systems, and Database applications. Brief introduction of different Data Models Hierarchical, Network and Relational; Concepts of Schema, Instance and data independence; Three tier schema architecture for data independence; Database system Environment, Centralized and Client Server architecture for the database.

UNIT - II
Entity Relationship Model: Introduction, Representation of entities, attributes, entity set, relationship, relationship set, Key constraints - Key constraints for Ternary Relationships, participation constraints, class hierarchies, Aggregation; sub classes, super class, inheritance, specialization, generalization using ER Diagrams.
Basic SQL: Form of a basic SQL Query, Examples of Basic SQL Queries, Expressions and Strings in the SELECT Command, Simple Database schema, data types, table definitions, different DML operations, basic SQL querying using where clause, arithmetic & logical operations, SQL functions - Date and Time, Numeric, String conversion.

UNIT - III

SQL : Creating tables with relationship, implementation of key and integrity constraints, nested queries, correlated Nested Queries, set-Comparison Operators, sub queries, grouping, aggregate operators, ordering, implementation of different types of joins, view - updatable and non-updatable; relational set operations, SQL constructs that grant access or revoke access from user or user groups.

Introduction to PL/SQL: Data types, Control Structures-if, while, for; functions, Exceptions – user defined and System defined; and Cursors implicit cursors and explicit cursors.

Advanced PL / SQL: Functions, Procedures, Packages and Triggers- before and after triggers.

UNIT - IV

Relational Model: Introduction to relational model, concepts of domain, attribute, tuple, relation, importance of null values - Comparisons Using Null Values, Logical Connectives AND, OR, and NOT, Impact on SQL Constructs, Disallowing Null Values; Integrity constraints in SQL - Domain constraints, Entity constraints, Referential integrity constraints, Assertions.

Schema Refinement (Normalization): Problems Caused by Redundancy, Decompositions, Problems Related to Decomposition, Functional dependency, Properties of Functional dependency, Normal forms based on functional dependency - 1NF, 2NF and 3NF, concept of surrogate key, Boyce-Codd normal form(BCNF), 4NF; Properties of Decompositions - Lossless join decomposition and dependency preserving decomposition.

UNIT - V

Transaction Management and Concurrency Control: Transaction - Single-User versus Multiuser Systems; Transactions, Database Items, Read and Write Operations, and DBMS Buffers, Why Concurrency Control Is Needed, Why Recovery Is Needed, Transaction States and Additional Operations, The System Log, Commit Point of a Transaction, properties of transactions, Characterizing Schedules Based on Serializability - Serial, Nonserial, and Conflict-Serializable Schedules; Testing for Conflict Serializability of a Schedule, How Serializability Is Used for Concurrency Control, Two-Phase Locking Techniques for Concurrency Control - Types of Locks and System Lock Tables, Guaranteeing Serializability by Two-Phase Locking, Dealing with Deadlock and Starvation; Concurrency Control Based on Timestamp Ordering - Timestamps, The Timestamp Ordering Algorithm.

UNIT - VI

Indexing Files: Operations on Files, Files of Unordered Records (Heap Files), Files of Ordered Records (Sorted Files), Hashing Techniques - Internal Hashing, External Hashing for Disk Files; Types of Single-Level Ordered Indexes - Primary Indexes, Clustering Indexes, Secondary Indexes; Multilevel Indexes, Dynamic Multilevel Indexes Using and B+-Trees.

TEXT BOOKS:

1. Database Management Systems, 3/e Raghuram Krishnan, Johannes Gehrke, TMH, 2003.

   (Unit II – Chapter 1, IV)

2. Fundamentals of Database Systems, 6/e Ramez Elmasri, Shamkant B. Navathe, PEA, 2010,

   (Unit I,II- Chapter2,III,V,VI)

REFERENCE BOOKS:

1. Database System Concepts. 5/e Silberschatz, Korth, TMH, 2006.

2. Introduction to Database Systems, 8/e C J Date, PEA, 2006.

3. The Database book principles & practice using Oracle/MySqlNarainGehani, University Press, 2006.

ADDITIONAL RESOURCES:

1. nptel.ac.in/courses/106106093

2. nptel.ac.in/courses/106104135

II B.TECH II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3

SOFTWARE ENGINEERING

COURSE OBJECTIVE:

The student will have a broad understanding of the discipline of software engineering and its application to the development of and management of software systems.

COURSE OUTCOMES:

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

CO1 : Understanding basic software engineering methods and practices, and their appropriate application.

CO2 : Identify the role of project management including planning, scheduling, risk management etc.

CO3 : Understanding of software process models such as the waterfall and evolutionary models.

CO4 : Understand the knowledge of software testing approaches and quality control and how to ensure good quality software.

SYLLABUS:

UNIT - I
Introduction to Software Engineering: Software-Software classification, Engineering Discipline; Software Crisis, Software Engineering definition, Evolution of Software Engineering Methodologies - exploratory, structured, data structure, object oriented, component based development; Software Engineering Challenges- problem understanding, quality and product, cycle time and cost, reliability, change and maintenance, usability and reusability, repeatability and process maturity, estimation and planning.
Software Processes: Software Process- software process model, elements of software process, characteristics of software process; Phased development life cycle- phased life cycle activity; Software Development Process Models- classical waterfall model, iterative waterfall, prototyping, incremental, spiral, agile process, RUP process model.

UNIT - II
Requirements Engineering: Software Requirements- business, user, system, functional and nonfunctional; Requirements engineering Process, Requirements elicitation-fact finding techniques; Requirements Analysis, Structured Analysis - data flow diagram, data dictionary, Structured analysis, pros and cons of structured analysis; Data Oriented Analysis- entity relationship modelling, data oriented analysis; Object Oriented Analysis- object oriented analysis,

object, dynamic ,function; Prototyping Analysis- throwaway, evolutionary; Requirements Specification- characteristics, components, structure, requirement specification methods; Requirements Validation- review, inspection, test case generation, reading, prototyping; Requirements Management.

UNIT - III

Software Design: Software Design Process, Characteristics of Good Software Design, Design Principles- abstraction, information hiding, functional decomposition, design strategies, modularity; Modular Design- coupling, cohesion; Design Methodologies- function oriented design, object oriented design; Structured Design- structure chart, structure vs flow chart; Structured Design Methodology- review and refine data flow diagram, identify boundaries between input process and output segments, apply design principles modularization criteria.

UNIT - IV

Implementation: Coding Principles- information hiding, structure programming, max cohesion and min coupling, code reusability, kiss, simplicity extensibility , code verification, code documentation; Coding Process- traditional coding process, test driven development.

Software Testing: Testing Fundamentals- errors, faults, failures, cost of defects, testing process, role of software testers; Test Planning- create a test plan, design test cases, test stubs and test drivers, test case execution, test summary report, defect tracking and statistics; Black Box Testing- equivalence class partitioning, boundary value analysis, cause effect graphing, error guessing; White Box Testing- control flow based, path, data flow based, mutation; Levels of Testing- unit, integration, system, acceptance.

UNIT - V

Software Project Management: Project Management Essentials- project, people, process, product; What is Project management- why do project failure occurs, keys to project success; Software Configuration Management- configuration identification, change control, status accounting, auditing.

Project Planning and Estimation: Project Planning activities, Software Metrics and measurements, Project Size Estimation - lines of code, functional point analysis; Effort Estimation Techniques- COCOMO cost models, analytical estimation.

UNIT - VI

Software Quality: software quality concept, Software Quality Factors, Verification & Validation, Software Quality Assurance- SQA activities, SQA plan; Capability Maturity Model (CMM) - SEI-CMM vs ISO standard.

Software Maintenance: Software maintenance- categories; Maintenance Process Models- quick fix, interactive-enhanced, IEEE 1219 model, ISO-12207 model; Maintenance Cost, Reengineering- reengineering process.

TEXT BOOKS:
1. Software Engineering, concepts and practices, Ugrasen Suman, 1/e, Cengage learning, 2015.
REFERENCE BOOKS:
1. Software Engineering principles and practice, W S Jawadekar, TMH, 2006
2. Software Engineering, 8/e, Sommerville, Pearson.
3. Software Engineering, 7/e, Roger S. Pressman, TMH
ADDITIONAL RESOURCES:
1. nptel.ac.in/courses/106101061

II B.TECH II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3

PROFESSIONAL ETHICS, VALUES AND PATENTS

COURSE OBJECTIVES:

To equip the student with the basic knowledge relating to the ethical behaviour in engineering discipline and to make the students understand the rules and regulation relating to intellectual property rights (Patents, copyrights, trademarks etc.,)

COURSE OUTCOMES:

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

CO1 : Learn necessary behavioural skills relating to the Ethics at industrial sector and to gain fundamental knowledge.

CO2 : Acquaint with basic human values, responsibilities and rights of engineers which are very much necessary today.

CO3 : Equip with knowledge on basics of intellectual property rights and cyber law.

CO4 : Gain knowledge on the patents, trademark and copy rights.

SYLLABUS

UNIT - I
Human Values: Ethics, Morals, Values, Integrity, Work Ethics, Service Learning, Civic Virtue, Respect for Others, Living Peacefully, Caring, Sharing, Honesty, Courage, Value of Time, Cooperation, Commitment, Empathy, Self-Confidence, Spirituality, Character.

UNIT - II
Engineering Ethics: Professional Roles to Be Played By Engineer - Engineers Role as Managers, Consultants and Leaders; Ethical Theories and its uses.

UNIT - III
Engineers Responsibilities and Rights: Professional Rights and Responsibilities, Whistle Blowing, Cross Cultural Issues and Occupational Crimes, Industrial Espionage.

UNIT - IV
Introduction to Intellectual Property Law : The Evolutionary Past, The IPR Tool Kit, Legal Tasks in Intellectual Property Law, Ethical obligations in Intellectual Property Law, Introduction to Cyber Law, Cybercrimes, Innovations and Inventions Trade related Intellectual Property Right.

UNIT - V

Intellectual property Rights : Basics, Types of Intellectual Property, Copy Rights – Principles-Subject Matter of Copy Rights; Copy Right Formalities and Registration, Patent Law - Rights and Limitations, Patent Requirements, Patent Registration Process.

UNIT - VI

Trademark: Trademark Registration Process - Post Registration Process, Transfer of Rights, Trade Secrets – Maintaining Trade Secrets; Physical Security, Employee Confidentiality Agreement.

TEXT BOOK:

1. Professional Ethics and Morals, Prof. A.R.Aryasri, Dharanikota Suyodhana, 1/e, Maruthi Publications.

2. Intellectual property , Deborah e. Bouchoux, 1/e, Cengage learning, New Delhi.

REFERENCES:

1. Kompal Bansal & Parishit Bansal" Fundamentals of IPR for Engineers BS Publications.

2. Cyber Law. Texts & Cases, South- western's special topics collections.

3. M. Ashok kumar and mohd. Iqbal Ali: "Intellectual property right" serials pub.

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

ADDITIONAL RESOURCES:

1. nptel.ac.in/courses/106102064/1

2. nptel.ac.in/courses/106103069

II B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	3	25	50	75	2
FRONT END WEB TECHNOLOGIES LAB							

COURSE OUTCOMES:

After Completion of this course student must be able to

CO1 : Practice and generate static html pages.

CO2 : Design html pages with different styles and develop interactive web pages with client side validations.

CO3 : Understand and experiment JQuery programming with html.

LIST OF PROGRAMS:

1) HOME PAGE:
The static home page must contain three frames.
Top frame: Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).
Left frame: At least four links for navigation, which will display the catalogue of respective links. For e.g.: When you click the link "MCA" the catalogue for MCA Books should be displayed in the Right frame.
Right frame: The pages to the links in the left frame must be loaded here. Initially this page contains description of the web site.

2) LOGIN PAGE
This page contains a form with two text boxes to enter userid & password. It also has submit and cancel buttons.

3) CATOLOGUE PAGE:
The catalogue page should contain the details of all the books available in the web site in a table. The details should contain the following:
  i.   Snap shot of Cover Page.
  ii. Author Name.
  iii. Publisher.
  iv. Price.
  v.   Add to cart button.

4) REGISTRATION PAGE:
Create a *registration form* with the following fields
  i.   Name (Text field)
  ii. Password (password field)
  iii. E-mail id (text field)

  iv. Phone number (text field)

  v. Sex (radio button)

  vi. Date of birth (3 select boxes)

  vii. Languages known (check boxes – English, Telugu, Hindi, Tamil)

  viii. Address (text area)

5) Design a web page using CSS (Cascading Style Sheets) which includes the following:

  Use different font, styles: In the style definition you define how each selector should work (font, color etc.). Then, in the body of your pages, you refer to these selectors to activate the styles

6) Write JavaScript code to perform client side from validation of HTML5 Registration page.

7) Design HTML5 web page by embedding Video element with custom controllers.

8) Design HTML5 web page by embedding Audio element with custom controllers.

9) Write HTML5 and JavaScript code to draw Circle Using Canvas.

10) Write HTML5 and JavaScript code to draw Rectangles Using Canvas.

11) Write HTML5 and JavaScript code to draw Arc Using Canvas.

12) Write HTML5 and JavaScript code to draw Triangle Using Canvas.

13) Write HTML5 and JavaScript code to draw a circle. Then double its size using canvas scaling.

14) Create an animation that moves a single rectangle horizontally across the canvas.

15) Write an XML file which will display the Book information which includes the following:

  i. Title of the book

  ii. Author Name

  iii. ISBN number

  iv. Publisher name

  v. Edition

  vi. Price

  Write a Document Type Definition (DTD) to validate the above XML file.

16) Write a jQuery code to make draggable Rectangle.

17) Write jQuery code to demonstrate the usage of important options disabled, delay, distance and clone in the drag function of jQuery UI.

18) Write jQuery code to demonstrate three options addClass, disable and tolerance in the drop function of jQuery UI.

19) Write jQuery code to demonstrates the use of two options delay and distance of selectable() method.

20) Write jQuery code to demonstrate Accordion.

21) Write jQuery code to demonstrate DatePicker.

II B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	3	25	50	75	2
DATABASE MANAGEMENT SYSTEMS LAB							

COURSE OUTCOMES:

After Completion of this course student must be able to

CO1 : Understand, analyse and apply SQL commands like DDL,DML,DCL to perform different Database operations

CO2 : Understand   and practice PL/SQL block, control statements and cursors.

CO3 : Develop PL/SQL programs using, functions, procedures, packages and Triggers

PROGRAMS LIST:

1. Creation, altering and droping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.

2. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.
   Example:- Select the roll number and name of the student who secured fourth rank in the class.

3. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

4. Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)

5. i)Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)
   ii)Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.

6. Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.

7. Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE-APPLICATION ERROR.

8. Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.

9. Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.

10. Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.

11. Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.

12. Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers

TEXT BOOKS:

1. ORACLE DATA BASE LOG PL/SQL Programming SCOTT URMAN, Tata Mc-Graw Hill.

REFERENCES:

1. ORACLE PL/SQL by example. Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3rd Edition
2. SQL & PL/SQL for Oracle 10g, Black Book, Dr.P.S. Deshpande.
3. Data Base Management System, Oracle SQL and PL/SQL, Pranab kumar Das Gupta, P Radha Krishna, PHI

II B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	0	0	0	0	0	0
VERBAL ABILITY							

COURSE OBJECTIVES:

1. To make students understand the usage of words, relationships; the alternatives and their meanings.

2. To give fair idea about understanding and comprehension skills

3. To make students understand arguments, draw conclusions and to deal in critical manner

4. To teach students-ways to overcome the confusions related to Grammar and Vocabulary

COURSE OUTCOMES:

At the end of the course Students will be able to

CO1 : Use appropriate words effectively in their communication

CO2 : Identify and correct Grammar and vocabulary related errors

CO3 : Construct the sentences effectively using appropriate verbal reasoning abilities

CO4 : Demonstrate understanding and comprehensive skills

SYLLABUS

UNIT - I
Synonyms1, Synonyms2, Antonyms1, Antonyms2, One-Word Substitution, Phrasal Verbs, Idioms & Phrases, Word Family Operation, Commonly Confused words, Odd man out

UNIT - II
Tenses, Voice, Parts of speech, Direct & Indirect Speech, Sentence Completion & Correction, Reconstruction of Sentences, Sentence Improvement, Choosing the Incorrect Sentences, Transformation

UNIT - III
Common Errors1, Common Errors2, Common Errors3, Common Errors4, Common Errors5, Indianisms1, Indianisms2

UNIT - IV
Direct / simple Analogy, Completing the analogous pair, choosing the Analogous pair, Double Analogy, Choosing a similar word, Detecting Analogies, Multiple-word Analogy

UNIT - V

Reading Comprehension1, Reading Comprehension2, Reading Comprehension3, Reading

Comprehension4, Cloze Passage1, Cloze Passage2, Cloze Passage3, Cloze Passage4

UNIT - VI

Hidden Assumptions, Fallacies, Induction & Deduction Methods, Arguments, Truth, Validity, Soundness

TEXT BOOKS:

1. 30 Days to a More Powerful Vocabulary by Funk.

2. Practical English Usage by Michael Swan

3. Practice & Pass Professional: Verbal Reasoning Tests: Practice Questions and Expert Coaching to Help You Pass by Alan Redman

4. Kaplan MCAT Verbal Reasoning and Writing Review

5. The Verbal Reasoning Test Workbook: Unbeatable Practice for Verbal Ability by Mike Bryon

6. Understanding and Using English Grammar by Betty Schrampfer Azar

REFERENCES:

1. http://www.verbalreasoningtest.org/

2. https://www.bond11plus.co.uk/verbal-reasoning

3. http://www.studyguidezone.com/mcat_verbalreasoning.htm

4. http://www.varsitytutors.com/mcat_verbal-practice-tests

5. https://www.khanacademy.org/test-prep/mcat

III B.TECH   I SEMESTER

III B.Tech – I SEMESTER COURSE STRUCTURE

S. NO	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	Design and Analysis of Algorithms	PC	3	1	-	40	60	100	3
2	OOAD through UML	PC	4	-	-	40	60	100	3
3	Compiler Design	PC	4	-	-	40	60	100	3
4	Computer Networks	PC	3	1	-	40	60	100	3
5	**Professional Elective – I** 1.Microprocessors and Multicore systems 2. Distributed Data Bases 3. Software Requirements & Estimation 4. Network Management Systems	PE	4		-	40	60	100	3
6	Operating Systems & Compiler Design Lab	PC	-	-	3	25	50	75	2
7	UML Lab	PC	-	-	3	25	50	75	2
8	Network & Unix Programming Lab	ES	-	-	3	25	50	75	2
9	Mini Project – I	PW	-	-	-	25	50	75	2
10	Quantitative Aptitude and Reasoning - II	MC	3	-	-	-	-	-	-
	Total		21	2	9	300	500	**800**	**23**

III B.TECH. I - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	0	40	60	100	3
DESIGN AND ANALYSIS OF ALGORITHMS							

COURSE OBJECTIVES:

- To analyze the asymptotic performance of algorithms.
- To write rigorous correctness proofs for algorithms.
- To demonstrate a familiarity with major algorithms and data structures.
- To apply important algorithmic design paradigms and methods of analysis.
- To synthesize efficient algorithms in common engineering design situations.

COURSE OUTCOMES:

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

CO 1: Apply asymptotic notations to analyze and compare performance of algorithms.

CO 2: Apply divide-and-conquer paradigm when an algorithmic design situation calls for it.

CO 3: Solve problems using greedy approach and whenever it is needed.

CO 4: Apply dynamic-programming, approach to solve suitable problems efficiently.

CO 5: Analyze backtracking and branch and bound paradigms.

SYLLABUS:

UNIT-I

Introduction: Algorithm Specification, Performance Analysis -Space complexity, Time complexity, Asymptotic Notations (Big-oh notation, Omega notation, Theta notation).

UNIT-II

Divide and Conquer: General method, Binary search, Merge sort, Quick sort, Strassen's matrix multiplication.

UNIT-III

Greedy method: General method, Knapsack problem, Job sequencing with deadlines, Minimum cost spanning trees, Single source shortest paths.

UNIT-IV

Dynamic Programming: The General method, All pairs shortest path problem, Optimal binary search trees, 0/1 knapsack, Reliability design, The Travelling sales person problem, Matrix-chain multiplication.

UNIT-V

Backtracking: The General method, N-Queen problem, Sum of subsets, Graph coloring, Hamiltonian cycles.

UNIT-VI

Branch and Bound: The method, 0/1 knapsack problem, Travelling sales person problem.

TEXT BOOK:

1. Fundamentals of Computer Algorithms, Second Edition – Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, Universities Press.

REFERENCE BOOKS:

1. Design and Analysis of Algorithms, First Edition – S. Sridhar, Oxford.
2. Introduction to Algorithms, second edition, T.H.Cormen, C.E.Leiserson, R.L.Rivest and C.Stein, PHI Pvt.Ltd.
3. Design and Analysis of Algorithms, Second Edition – Parag Himanshu Dave, Himanshu Bhalchandra Dave, Pearson Education.
4. Design and Analysis of Computer Algorithms – Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman, Pearson Education.
5. Introduction to the Design and Analysis of Algorithms, Third Edition – Anany Levitin, Pearson Education.

ONLINE REFERENCES:

1. http://www.personal.kent.edu/~rmuhamma/Algorithms/algorithm.html
2. https://www.coursera.org/learn/algorithms-divide-conquer
3. http://nptel.ac.in/courses/106101060/
4. https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-046j-design-and-analysis-of-algorithms-spring-2015/index.htm

III B.TECH. I - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
OOAD through UML							

COURSE OBJECTIVES:

- Importance of modeling in Software Development Life Cycle.
- Different diagrams and relationships.
- Unified application for a system.

COURSE OUTCOMES:

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

CO 1: Illustrate the conceptual model of UML in software development life cycle.(K2)
CO 2: Outline Common Modeling Techniques of Structural Modeling.(K2)
CO 3: Analyze, design and document the requirements through use case driven approach(K3)
CO 4: Identify, analyze and model the behavioral concepts of a system and Apply Unified
        Modeling Language (UML) towards analysis and design(K4)
CO 5: Apply the concepts of architectural design for deploying the code for software(K3)

SYLLABUS:

UNIT I

Introduction to UML: Importance of Modeling, Principles of Modeling, Object Oriented Modeling, Conceptual Model of the UML, Architecture, Software Development Life Cycle.

UNIT II

Basic Structural Modeling : Classes-Terms and Concepts, Common Modeling Techniques-Modeling the Vocabulary of a system, Modeling the Distribution of Responsibilities in a System, Modeling the Non-Software things, Modeling the Primitive Types, **Relationships**- Terms and Concepts, Common Modeling Techniques-Modeling Simple Dependencies, Modeling Single Inheritance, Modeling Structural Relationships, common Mechanisms-Modeling New Building Blocks, Modeling Comments, Modeling New Semantics, Modeling New Properties, and **Diagrams**- Terms and Concepts, Common Modeling Techniques-Modeling Different Views of a System, Modeling Different Levels of Abstractions, Modeling Complex Views.

Advanced Structural Modeling : Advanced Classes- Terms and Concepts, Modeling the Semantics of a Class, Advanced relationships- Terms and Concepts, Common Modeling Techniques-Modeling the advanced web of relationships, **Interfaces, Types and Roles** - Terms and Concepts, Modeling the Seams in a System, Modeling static and dynamic types, **Packages**-Terms and Concepts, Common Modeling Techniques-Modeling Group of elements, Modeling Architectural Views.

UNIT III

Class & Object Diagrams : Class Diagrams-Terms and Concepts, Common Modeling Techniques-Modeling Simple Collaborations, Modeling Logical Database Schema, Forward and Reverse Engineering, **Object Diagrams**- Terms and Concepts, Common Modeling Techniques-Modeling Object Structures, Forward and Reverse Engineering.

Basic Behavioral Modeling-I : Interactions- Terms and Concepts, Common Modeling Techniques-Modeling a Flow of Control, **Interaction Diagrams**- Terms and Concepts, Common Modeling Techniques-Modeling a Flows of Control by Time Ordering, Modeling a Flows of Control by Organization, Forward and Reverse Engineering.

UNIT IV

Basic Behavioral Modeling-II : Use cases- Terms and Concepts, Common Modeling Techniques-Modeling the Behavior of an Element, **Use case Diagrams**- Terms and Concepts, Common Modeling Techniques- Modeling the Context of a System, Modeling the Requirements of a System, Forward and Reverse Engineering, **Activity Diagrams**- Terms and Concepts, Common Modeling Techniques-Modeling a Workflow, Modeling an Operation, Forward and Reverse Engineering.

UNIT V

Advanced Behavioral Modeling : Events and Signals-Terms and Concepts, Common Modeling Techniques-Modeling a Family of Signals, Modeling Exceptions, State Machines-Terms and Concepts, Common Modeling Techniques-Modeling Lifetime of an object, **Processes and Threads**-Terms and Concepts, Common Modeling Techniques-Modeling Multiple Flows of Control, Modeling Inter Process Communication, **Time and Space**-Terms and Concepts, Common Modeling Techniques- Modeling Timing Constraints, Modeling the Distribution of Objects, Modeling Objects that Migrate, **State Chart Diagrams**- Terms and Concepts, Common Modeling Techniques- Modeling Reactive Objects, Forward and Reverse Engineering.

UNIT VI

Architectural Modeling : **Component**-Terms and Concepts, Common Modeling Techniques-Modeling Executables and libraries, Modeling Tables, Files and Documents, Modeling an API, Modeling Source Code, **Deployment**- Terms and Concepts, Common Modeling Techniques-Modeling Processors and Devices, Modeling the Distribution of Components, **Component Diagrams**- Terms and Concepts, Common Modeling Techniques- Modeling Executable Release, Modeling a Physical Database, Modeling Adaptable Systems, Forward and Reverse Engineering and **Deployment Diagrams**- Terms and Concepts, Common Modeling Techniques- Modeling an Embedded System, Modeling a Client/Server System, Modeling a Fully Distributed System, Forward and Reverse Engineering. **Case Study:** The Unified Student Database application.

TEXT BOOK:

1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education.

REFERENCE BOOKS:

1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.

2. Pascal Roques: Modeling Software Systems Using UML2, WILEYDreamtech India Pvt. Ltd.

3. Atul Kahate: Object Oriented Analysis & Design, The McGraw-Hill Companies.

4. Mark Priestley: Practical Object-Oriented Design with UML,TATA McGrawHill

5. Appling UML and Patterns: An introduction to Object – Oriented Analysis and Design in interactive Development. Craig Larman

6. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.

ONLINE REFERENCES:

1. https://www.uml-diagrams.org/uml-object-oriented-concepts.html
2. https://www.lucidchart.com/blog/uml-diagram-templates
3. https://www.smartdraw.com/uml-diagram/
4. https://www.ibm.com/developerworks/rational/library/769.html

III B.TECH. I - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
COMPILER DESIGN							

COURSE OBJECTIVES:

- Understand the process involved in a Compiler.
- Create an overall view of various types of translators, linkers, loaders, and phases of a compiler.
- Understand the Syntax Analysis, Various types of Parsers, like the Top-Down approach, and the Bottom- Up approach parsers.
- Gives a view of Intermediate Code Generation, Type Checking,
- Understand the role of Symbol Table and its organization.
- Describe Code Generation, Machine Independent Code Optimization and Instruction Scheduling.

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. Apply various Top-Down and Bottom-Up Parsing techniques.(K3)
CO 3. Interpret different types of semantic rules and Intermediate Code representations.(K2)
CO 4. Illustrate the effective usage of register allocation and various Code-generation techniques. (K2)
CO 5. Summarize different code-optimization techniques. (K2)

SYLLABUS:

UNIT–I
Overview of Language Processing: Pre-processor, compiler, assembler, interpreter, linker & loader and phases of a compiler.

Lexical Analysis: Role of the lexical analysis, lexical analysis vs. parsing, token, patterns and lexemes, lexical errors. Regular expressions: Regular definitions for the language constructs, strings, sequences, transition diagram for recognition of tokens, reserved words and identifiers with examples.

UNIT–II
Syntax Analysis: Discussion on CFG, LMD, RMD, ambiguity, parse tree, role of the parser, Classification of Parsing Techniques: Brute Force approach, left recursion, left factoring. Top-down parsing: FIRST and FOLLOW, LL(1) grammars, non-recursive predictive parsing and error recovery in predictive parsing.

UNIT–III
Types of Bottom-Up Approaches: Introduction to bottom-up parser, Why LR Parsers?, model of an LR parsers, operator precedence parser, shift- reduce parser, difference between LR and LL Parsers, Construction of SLR Table. More Powerful LR parsers: Construction of CLR (1), LALR parsing table, dangling ELSE ambiguity, and error recovery in LR parsing and comparison of all bottom-up approaches with all top-down approaches.

UNIT–IV

Semantic analysis: SDT schemes, evaluation of semantic rules, intermediate codes, three address codes - quadruples, triples, abstract syntax trees, types and declarations, type checking.

UNIT–V

Symbol Table: Use and need of symbol tables, runtime environment storage organization, stack allocation, access to non-local data, heap management.

Code Generation: Issues, target machine, basic blocks and flow graphs, simple code generator, peep-hole optimization.

UNIT–VI

Machine Independent Code Optimization: Semantic preserving transformations, global common sub expression elimination, copy propagation, dead code elimination, constant folding, strength reduction, loop optimization, instruction scheduling and inter procedural optimization.

TEXT BOOKS:

1. Compilers – Principles, Techniques, & Tools by Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, Second edition, Pearson, 2007.
2. Compiler Design by K. Muneeswaran, Oxford University Press, 2013.

REFERENCE BOOKS:

1. Engineering a Compiler by Keith D. Cooper, & Linda Torczon, Second edition, Morgan Kaufman publications, 2011.
2. Principles of Compiler Design by V. Raghavan, Second edition, TMH, 2011.
3. Compiler Construction - Principles and Practice by Kenneth C. Louden, First edition, Cengage Learning publications, 1997.
4. Implementations of Compiler - A new approach to Compilers including the Algebraic Methods by Yunlin Su, Song Y. Yan, Springer publications, 2011.

ONLINE REFERENCES:

1. http://www.diku.dk/hjemmesider/ansatte/torbenm/Basics/
2. http://nptel.ac.in/courses/106108052/1
3. https://www.geeksforgeeks.org/compiler-design-tutorials/
4. https://link.springer.com/article/10.1007/s10766-005-3590-6

III B.TECH. I - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	1	0	40	60	100	3
COMPUTER NETWORKS							

COURSE OBJECTIVES:

- To provide knowledge on the fundamental concepts of the Computer Networks and problem solving techniques on Networks.

COURSE OUTCOMES:

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

CO 1: Summarize basic concepts of Data Communication and Networking.

CO 2: Interpret design issues of data link layer.

CO 3: Make use of data link layer services to provide well defined interface.

CO 4: Analyze different routing protocols.

CO 5: Illustrate the essential principles of different transport layer protocols.

CO 6: Summarize various application layer protocols.

SYLLABUS:

UNIT – I

Introduction: OSI Overview, TCP/IP and Other Network Models, Examples of Networks: Novell Networks, Arpanet, Internet, Network Topologies, WAN, LAN, MAN.

UNIT – II

Data Link Layer: Design Issues- Framing, Services Provided to Network Layer, Flow Control, Error Control, Error Detection and Correction-CRC, Checksum-Idea, One's Complement, Hamming code. **IEEE Standards:** 802.3 - Frame Format, 802.11 - Frame Format.

UNIT – III

Elementary Data Link Layer Protocols: Simplex Protocol, Simplex Stop and Wait, Simplex Protocol for Noisy Channel.

Sliding Window Protocol: One Bit, Go Back N, Selective Repeat-Stop And Wait Protocol, Examples Of Data Link Protocols- HDLC, PPP.

Medium Access Control Sub Layer: Chanel Allocation Problem, ALOHA, Carrier Sense Multiple Access (CSMA), CSMA With Collision Detection, CSMA With Collision Avoidance, Collision Free Protocols: Limited Contention Protocols, Wave Length Division Multiple Access Protocol, Bridges.

UNIT – IV

Network Layer: Network Layer Design Issues- Store And Forward Packet Switching, Service Provided to Transport Layer, Connection Oriented and Connection Less Service, Comparison of Virtual Circuit and Datagram Subnets.

Routing Algorithms: Optimality Principle, Shortest Path Routing, Flooding, Hierarchical Routing, Broad Cast, Multi Cast, Distance Vector Routing, Link State Routing.

Network Layer in Internet: IP Protocol, IP Address, IPv4 frame format.

UNIT –V

Transport Layer: The Transport Services- Services Provided to the Upper Layer, Transport Service Primitives, Berkeley Sockets, Elements of Transport Protocol-Addressing, Connection Establishment, Connection Release, Flow Control and Buffering, Multiplexing, Crash Recovery.

The Internet Transport Protocols: TCP and UDP.

UNIT –VI

Application Layer: DNS(Domain Naming System)-DNS Namespace, Name Servers., Electronic Mail- Architecture And Services, The User Agent, Message Format-MIME, Sending and Receiving E-mail, Message Transfer- SMTP, Final Delivery-POP3, IMAP.

The World Wide Web- Architecture Overview, URL, HTTP.

TEXT BOOKS:

1. Computer Networks — Andrew S Tanenbaum, 4th Edition, Pearson Education/PHI
2. Data Communications and Networks – Behrouz A.Forouzan, Third Edition, TMH

REFERENCE BOOKS:

1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education
2. Understanding Communications and Networks, 3rd Edition, W.A. Shay, Thomson.

ONLINE REFERENCES:

1. https://onlinecourses.nptel.ac.in/noc18_cs38
2. https://in.udacity.com/course/computer-networking--ud436
3. https://www.class-central.com/subject/computer-networking
4. https://www.youtube.com/watch?v=3DZLItfbqtQ&list=PL32DBC269EF768F74

III B.TECH. I - SEMESTER (Professional Elective-I)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
MICROPROCESSORS AND MULTICORE SYSTEMS							

COURSE OBJECTIVES:

- Learn how the hardware and software components of a microprocessor-based system

- Work together to implement system-level features.

- Learn both hardware and software aspects of integrating digital devices into microprocessor-based systems.

COURSE OUTCOMES:

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

CO 1: Analyze the various basic building blocks of 8086, 80286, 80486 and Pentium microprocessors.

CO 2: Make Use of various instructions and assembler directives to develop programs on the target microprocessor.

CO 3: Make Use of various types of procedures and macros to develop programs on the target microprocessor.

CO 4: Analyze various types of interrupts and interrupt applications of 8086.

SYLLABUS:

UNIT-I

Overview of microcomputer structure and operation-memory, input/output, central processing unit, address, data bus, control bus, hardware, software and firm ware, microprocessor evolution and types- microprocessor evolution, dedicated controllers, bit-slice processors and general processors, the 8086 microprocessor family-overview , 8086 internal architecture-the execution unit, the BIU, introduction to programming the 8086-programming languages, how the 8086 accesses immediate and register data, accessing data in memory.

8086 family assembly language programming: Program development steps- defining the problem, representing program operations, finding the right instruction.

UNIT-II

Implementing standard program structures in 8086 assembly language:

Simple sequence programs-finding the average of two numbers, converting two ASCII codes to packed BCD, jumps, flags and conditional jumps, if-then, if-then-else and multiple if-then-else programs, while-do programs, repeat-until programs, instruction timing and delay loops.

UNIT-III

Strings, procedures and macros:

The 8086 string instructions-introduction and operation, writing and using procedures-introduction, the 8086 CALL and RET instructions, writing and using assembler macros-macros

and procedures compared, defining and calling a macro without parameters, passing parameters to macros.

8086 instruction descriptions and assembler directives:

Instruction descriptions, AAA, AAD, AAM, AAS, AND, CALL, CMO, DEC, HLT, assembler directives, ASSUME,DB, DD, DQ, DT, DW, END, ENDS, EVEN, EXTRN, GLOBAL, GROUP, LABEL, PROC.

UNIT-IV

8086 interrupts and interrupt applications:

8086 interrupts and interrupt responses-overview, an 8086 interrupt response example-   Type 0, 8086 interrupt types, hardware interrupt applications- simple interrupt data input, using interrupt for counting and timing, 8259A priority interrupt controller- overview and system connections, 8259A system connections and cascading, initializing an 8259A, software interrupt applications.

UNIT-V

CPU: Architecture of Intel 80286 CPU- 80286 architecture, signals and system connections, 80286 real address mode operation, 80286 protected mode operation, 80286 new and enhanced instructions, 80486-Microprocessor.

UNIT-VI

An Introduction to the Pentium Processors:

The Pentium Processor, The 4MB page and Flat memory model, advanced programmable interrupt controller(APIC), multimedia extension technology, model specific registers(MSRs) and machine check(MC) exceptions, other MSRs of the Pentium processor, new instructions of Pentium processors.

TEXT BOOK:

1. Microprocessors and Interfacing, Douglas V Hall, Revised Second Edition, Tata McGraw-Hill Publishing company limited, New Delhi.

REFERENCE BOOK:

1. The Intel Microprocessors, Architecture, programming and interfacing, 8Edition, Barry Bray, Pearson.

ONLINE REFERENCES:

1. https://www.youtube.com/watch?v=xmJHxlKmyFY
2. https://www.youtube.com/watch?v=EbZdGsSkCNc
3. https://www.docsity.com/en/microprocessor-programming-8086-interrupts-and-interrupt-applications/30789/

III B.TECH. I - SEMESTER (Professional Elective-I)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
DISTRIBUTED DATABASES							

COURSE OBJECTIVES:

- To understand how data is collected and distributed in a database across multiple physical locations.
- To Gain advanced knowledge on creating and maintaining databases in distributed environment, how to handling all types of queries, query optimization techniques.
- To improve database performance at end-users worksites.
- Understand and to get knowledge of advanced features of object orientation and interoperability object management in distributed environment.
- Management of distributed data with different levels of transparency.
- Understand how to use database management tools in resolving deadlock situations.

COURSE OUTCOMES:

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

CO 1: Interpret the introductory distributed database concepts and its structures.

CO 2: Summarize the issues involved in distributed query processing

CO 3: Outline the issues involved in distributed query optimization.

CO 4: Analyze the Transaction Management in a distributed database environment.

CO 5: Compare and Contrast distributed concurrency control Techniques.

CO 6: Illustrate how reliability is ensured in Distributed Databases.

SYLLABUS:

UNIT-I

Features of Distributed versus Centralized Databases, Principles Of Distributed Databases, Levels Of Distribution Transparency, Reference Architecture for Distributed Databases, Types of Data Fragmentation, Integrity Constraints in Distributed Databases.

UNIT–II

Translation of Global Queries to Fragment Queries, Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.

UNIT–III

Optimization of Access Strategies, A Framework for Query Optimization, Join Queries, General Queries.

UNIT–IV

The Management of Distributed Transactions, A Framework for Transaction Management, Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions.

UNIT-V

Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

UNIT–VI

Reliability, Basic Concepts, Nonblocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, CAP Theorem, Checkpoints and Cold Restart, Distributed Database Administration, Catalog Management in Distributed Databases, Authorization and Protection

TEXTBOOK:

1. Distributed Database Principles & Systems, Stefano Ceri, Giuseppe Pelagatti McGraw-Hill

REFERENCE:

1. Principles of Distributed Database Systems, M.Tamer Ozsu, Patrick Valduriez − Pearson Education.

ONLINE REFERENCES:

1. https://infolab.usc.edu/csci585/Spring2008/Lectures/DDBMS-Introduction.pdf
2. https://www.slideshare.net/alekbr/cap-theorem
3. https://www.youtube.com/playlist?list=PL5CFF8857F98258ED
4. https://www.tutorialspoint.com/distributed_dbms/index.htm

III B.TECH. I – SEMESTER (Professional Elective-I)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
SOFTWARE REQUIREMENTS AND ESTIMATION							

COURSE OBJECTIVES:

- The student will demonstrate an understanding of the proper contents of a software requirements document.

COURSE OUTCOMES:

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

CO 1: Outline knowledge about software requirements.

CO 2: Apply principles of software requirements management and modeling.

CO 3: Apply various methods to estimate size of software.

CO 4: Illustrate software estimation in terms of cost, effort and schedule.

CO 5: Summarize the benefits of different software requirement management tools.

CO 6: Identify and analyze software estimation tools.

SYLLABUS:

UNIT I

Software Requirements: What and Why

Essential Software requirement, Good practices for requirements engineering, Improving requirements processes, Software requirements and risk management

Software Requirements Engineering

Requirements elicitation, requirements analysis documentation, review, elicitation techniques, analysis models, Software quality attributes, risk reduction through prototyping, setting requirements priorities, verifying requirements quality,

UNIT II

Software Requirements Management

Requirements management Principles and practices, Requirements attributes, Change Management Process, Requirements Traceability Matrix, Links in requirements chain.

Software Requirements Modeling

Use Case Modeling, Analysis Models, Dataflow diagram, state transition diagram, class diagrams, Object analysis, Problem Frames

UNIT III
Software Estimation
Components of Software Estimations, Estimation methods, Problems associated with estimation, Key project factors that influence estimation
Size Estimation
Two views of sizing, Function Point Analysis, Mark II FPA, Full Function Points, LOC Estimation, Conversion between size measures,

UNIT IV

Effort, Schedule and Cost Estimation

What is Productivity? Estimation Factors, Approaches to Effort and Schedule Estimation, COCOMO II, Putnam Estimation Model, Algorithmic models, Cost Estimation

UNIT V

Tools for Requirements Management

Requirements Management Tools: Benefits of using a requirements management tool, commercial requirements management tool, Rational Requisite pro, Caliber – RM, implementing requirements management automation,

UNIT VI

Tools for Software Estimation

Software Estimation Tools: Desirable features in software estimation tools, IFPUG, USC's COCOMO II, SLIM (Software Life Cycle Management) Tools

TEXT BOOK:

1. Software Requirements and Estimation by Rajesh Naik and Swapna Kishore, Tata Mc Graw Hill.

REFERENCE BOOKS:

1. Software Requirements by Karl E. Weigers, Microsoft Press.
2. Managing Software Requirements, Dean Leffingwell & Don Widrig, Pearson Education, 2003.
3. Mastering the requirements process, second edition, Suzanne Robertson & James Robertson, Pearson Education, 2006.
4. Estimating Software Costs, Second edition, Capers Jones, TMH, 2007.
5. Measuring the software process, William A. Florac & Anita D. Carleton, Pearson Education, 1999.

ONLINE REFERENCES:

1. https://www.youtube.com/watch?v=Vz7TQ3eAQiU
2. https://www.youtube.com/watch?v=aHqT0gyvbtg
3. https://freevideolectures.com/course/2318/software-engineering/5

III B.TECH. I - SEMESTER (Professional Elective-I)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3

NETWORK MANAGEMENT SYSTEMS

COURSE OBJECTIVES:

- To understand the principles of network management, different standards and protocols used in managing complex networks.

- To understand the Automation of network management operations and making use of readily available network management systems.

COURSE OUTCOMES:

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

CO 1: Interpret different Network Management standards.
CO 2: Compare and contrast Network Management in different SNMP Models.
CO 3: Outline Network Management architecture and Protocols.
CO 4: Summarize the functions of different remote monitoring protocols.
CO 5: Outline the knowledge about various Network Management tools and Systems.

SYLLABUS:

UNIT - I

Data communications and Network Management Overview : Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management.

UNIT - II

SNMPV1 Network Management: Organization and Information and Information Models, Managed Network: Case Histories and Examples, The History of SNMP Management, The SNMP Model, The Organization Model, System Overview, The Information Model.

UNIT - III

SNMPv1 Network Management: Communication and Functional Models. The SNMP Communication Model, Functional model.

UNIT - IV

SNMP Management: SNMPv2: Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, The SNMPv2 Management Information Base, SNMPv2 Protocol, Compatibility With SNMPv1.

UNIT - V

SNMP Management: RMON: What is Remote Monitoring? , RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring, A Case Study of Internet Traffic Using RMON

UNIT - VI

Network Management Tools and Systems: Network Management Tools, Network Statistics Measurement Systems, History of Enterprise Management, Network Management systems, Commercial Network management Systems, System Management, Enterprise Management Solutions.

TEXT BOOK:

1. Network Management, Principles and Practice, Mani Subramanian, Pearson Education.

REFERENCES:

1. Network management, Morris, Pearson Education.
2. Principles of Network System Administration, Mark Burges, Wiley Dreamtech.
3. Distributed Network Management, Paul, John Wiley.

ONLINE REFERENCES:

1. https://www.youtube.com/watch?v=spbZmJaoitY
2. https://www.youtube.com/watch?v=PLjzgYyTQOs
3. http://nptel.ac.in/courses/106105081/2
4. https://www.youtube.com/watch?v=VbXqPH1AHLs

III B.TECH. I - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	3	25	50	75	2

OPERATING SYSTEMS & COMPILER DESIGN LAB

COURSE OBJECTIVES:

- To enlighten the student with knowledge base in Operating Systems and Compiler Design Applications.

COURSE OUTCOMES:

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

CO 1: Apply various scheduling, page replacement and Deadlock avoidance algorithms for effective utilization of the CPU.

CO 2: Demonstrate various Memory Management Techniques.

CO 3: Develop a Lexical Analyzer for a given language.

CO 4: Develop LALR bottom up Parser for a given language by using YACC tool.

LIST OF EXPERIMENTS

1. Simulate the following CPU scheduling algorithms.
   a) Round Robin   b) SJF   c) FCFS   d) Priority

2. Simulate all file allocation strategies.
   a) Sequential   b) Indexed   c) Linked.

3. Simulate Bankers Algorithm for Dead Lock Avoidance and Prevention
4. Simulate all page replacement algorithms
   a) FIFO   b) LRU   c) LFU

5. Simulate Paging Technique of memory management.
6. Design a lexical analyzer for given language and the lexical analyzer should ignore redundant spaces, tabs, new lines and comments.
7. Implement the lexical analyzer using lex lexical analyzer generating tool.
8. Develop an operator precedence parser for a given language.
9. Implementation of shift reduce parsing algorithm.
10. Design a LALR bottom up parser for the given language.

REFERENCE BOOKS:

1. Compilers – Principles, Techniques, & Tools by Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, Second edition, Pearson, 2007.

2. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.

III B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	3	25	50	75	2
UML LAB							

COURSE OBJECTIVES:

- To learn importance of modelling in Software Development Life Cycle.
- To know about different diagrams and relationships.
- To develop a unified application for a system.

COURSE OUTCOMES:

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

CO 1: Build use case diagrams that specify requirements for a software system.

CO 2: Develop class diagrams that demonstrate design model of a software system.

CO 3: Make use of interaction diagrams to model the dynamic aspects of a software system.

CO 4: Develop various applications using unified modeling language.

LIST OF EXPERIMENTS

1. Learning the usage of Rational Rose Software and different tools that are helpful to implement UML.
2. Create UML for Library Management system
3. Create UML for ATM system
4. Create UML for Online Book Shop system
5. Create UML for Online Railway Reservation system.
6. Create UML for Banking System.
7. Create UML for Airlines System.
8. Create UML for Student Information System.

ONLINE REFERENCES:

1. https://www.udemy.com/uml-fundamentals/
2. https://www.youtube.com/watch?v=OkC7HKtiZC0&list=PLGLfVvz_LVvQ5G-LdJ8RLqe-ndo7QITYc
3. https://www.youtube.com/watch?v=RRXe1omEGWQ&list=PLD4EF3E3AD055F3C7

III B.TECH. I - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	3	25	50	75	2
NETWORK & UNIX PROGRAMMING LAB							

COURSE OBJECTIVES:

- To teach students practical orientation of networking concepts.

- To teach students various UNIX utilities and shell scripting.

COURSE OUTCOMES:

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

CO 1: Demonstrate different network layer routing protocols.

CO 2: Implement different Services offered by Data Link Layer.

CO 3: Experiment with the fundamental UNIX utilities.

CO 4: Develop shell scripts to perform complex tasks.

LIST OF EXPERIMENTS

PART – A

1. Implement the data link layer framing methods such as character stuffing and bit stuffing.
2. Implement on a data set of characters the three CRC polynomials – CRC 12, CRC 16 and CRC CCIP.
3. Implement Dijkstra's algorithm to compute the Shortest path through a graph.
4. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table art each node using distance vector routing algorithm
5. Take an example subnet of hosts. Obtain broadcast tree for it.

PART – B

1. a)
    i. Log into the system
    ii. Use Vi editor to create a file called myfile.txt which contain some text.
    iii. Correct typing errors during creation
    iv. Save the file
    v. Logout of the file
  b)
    i. Log into the system
    ii. Open the file created in session 1
    iii. Add some text
    iv. Change some text
    v. Delete some text
    vi. Save the changes
    vii. Logout of the system

2.
   a) Log into the system
   b) Use the cat command to create a file containing the following data. Call it mutable use tabs to separate the fields

i.	1425	ravi	15.65
ii.	4320	ramu	26.27
iii.	6830	sita	36.15
iv.	1450	raju	21.86

   c) Use the cat command to display the file, my table
   d) Use the vi command to correct any errors in the file, my table
   e) Use the sort command to sort the file my table according to the first field. Call the sorted file my table(same name)
   f) Print the file my table
   g) Use the cut & paste commands to swap fields 2 and 3 my table. Call it mytable (same name)
   h) Print the new file, my table
   i) Logout of the system

3.
   a) log in the system
   b) use the appropriate commands to determine ur login shell
   c) use the /etc/passwd file to verify the result of step b.
   d) use the who command redirect the result to a file called myfile1.Use the more command to see the contents of myfile1.
   e) use the date and who commands in sequence ?(in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called my file2.Use the more command to check the contents of myfile2.
   f) write a sed command that deletes the first character in each line in a file
   g) write a sed command that deletes the character before the last character in each line in a file.
   h) write a sed command that swaps the files and second words in each line in a file

4.
   a) Write A shell script that takes a command –line argument and reports on whether it is directory ,a file, or something else
   b) Write a shell script that accepts one or more file name as a arguments and converts all of them to uppercase, provided they exits in the current directory
   c) Write a shell script that determines the period for which a specified user is working on the system

5.
   a) Write a shell script that accepts a file name starting and ending line numbers as arguments and displays all the lines between the given line numbers
   b) Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.

6.
   a) Write a shell script that computes the gross salary of a employee according to the following
      1) if basic salary is <1500 then HRA 10% of the basic and DA =90% of the basic

    2) if basic salary is >1500 then HRA 500 and DA =98% of the basic
- b) The basic salary is entered interactively through the key board
- c) Write a shell script that accepts two integers as its arguments and computes the value of first number raised to the power of the second number

7.
- a) Write an interactive file handling shell program. Let it offer the user the choice of copying, removing, renaming or linking files. Once the use has made a choice, have the program ask the user for necessary information, such as the file name, new name and so on.
- b) Write a shell script that takes a login name as command –line argument and reports when that person logs in
- c) Write a shell script which receives two files names as arguments. It should check whether the two file contents are same or not. If they are same then second file should be deleted.

8.
- a) Write a shell script that displays a list of all files in the current directory to which the user has read write and execute permissions
- b) Develop an interactive script that asks for a word and file name and then tells how many times that word occurred in the file.
- c) Write a shell script to perform the following string operations.
  1. To extract a sub string from a given string
  2. To find the length of a given string

9.
- a) Write a C program that takes one or more files or directory names as command line input and reports the following information on the file:
  i)File type ii)Number of links iii)Read, write and execute permissions iv)Time of last access (Note : Use stat/fstat system calls)

- b) Write C programs that simulate the following unix commands:
  a)mv b)cp (Use system calls)

10. Write a C program that illustrates the creation of child process using fork system call.

ONLINE REFERENCES:

1. https://www.learnshell.org
2. https://www.udemy.com/shellprogramming/
3. https://www.edureka.co/unix

III B.TECH. I - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	0	25	50	75	2
MINI PROJECT - I							

COURSE OBJECTIVES:

- To offer students a glimpse into real world problems and challenges that need IT based solutions.
- To enable students to create very precise specifications of the IT solution to be designed.
- To enable students to use concepts of IT in creating a solution for a problem
- To improve the team building, communication and management skills of the students.

COURSE OUTCOMES:

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

CO1: Acquire practical knowledge within the chosen area of technology for project development.

CO2: Identify, analyze, formulate and handle programming projects with a comprehensive and systematic approach.

CO3: Contribute as an individual or in a team in development of technical projects.

CO4: Develop effective communication skills for presentation of project related activities.

The student will do Mini Project -I during 2nd year summer vacation. It will be evaluated at the end of III B.Tech first semester as per academic regulation. The main intention of Mini Project is to make student enable to apply the knowledge and skills learned out of courses studied and any other technology whatever he/she is interested to solve problem. The Mini Project may be beyond the scope of curriculum of courses taken or may be based on the courses but thrust should be on

- ➢ Learning additional skills
- ➢ Development of ability to define and design the problem and lead to its accomplishment with proper planning.
- ➢ Learn the behavioral science by working in a group

1. Batch Formation:

For the purpose of project work, II CSE students are divided into 3 groups namely A,B,C as per their total marks obtained up to II Year I Sem in descending order .Now from group A first student (say A1), from group B last student (say B1), from group C last student (say C1) are formed as one batch. This procedure is adopted for batch formation.

2. Guide Allotment:

Once batches are formed, Students can select their guide from list of faculty available depending on the domain of their project and interest. After guide accepted the project then abstract will be submitted to the coordinator and Head of Department.

3. Internal Evaluation of the Mini project-I

PRC will organize project seminar and final execution of the project. Out of 25 internal marks, 15 marks for execution of the project and 10 marks for project Presentation.

4. External Evaluation of Mini Project - I:

For external viva the evaluation committee consists of external examiner, guide & HOD. This viva is conducted for 50 marks.

III B.TECH. I - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	2	0	0	0	0	0	0
QUANTITATIVE APTITUDE AND REASONING - II							

COURSE OBJECTIVES:

- To train students in analysing real life scenarios considering all factors
- To educate the students on principles of mathematical problems and problem solving methods
- To train students for campus placements

COURSE OUTCOMES:

After thorough learning of Quantitative Aptitude and Reasoning, a student:

CO 1: Will be able to prepare well for clearing Quantitative Aptitude and Reasoning tests for campus placements

CO 2: Will be able to critically evaluate various real life situations by resorting to Analysis of key issues and factors.

CO 3: Will be able to demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.

UNIT - I

Numbers: Classification of numbers, Divisibility rules, Finding the units digit, Finding remainders in divisions involving higher powers, LCM and HCF Models

Time and Distance: Relation between speed, distance and time, Converting km/h into m/s and vice versa, Problems on average speed, Problems on relative speed, Problems on trains, Problems on boats and streams, Problems on circular tracks, Problems on races
Time and Work: Problems on Unitary method, Relation between Men, Days, Hours and Work , Problems on Man-Day-Hours method, Problems on alternate days, Problems on Pipes and Cisterns .
Averages, Mixtures and Allegations: Definition of Average, Rules of Average, Problems on Average, Problems on Weighted Average, Finding average using assumed mean method, Problems on mixtures, Allegation rule, Problems on Allegation.

UNIT - II

Data Interpretation: Problems on tabular form, Problems on Line Graphs, Problems on Bar Graphs, Problems on Pie Charts
Data Sufficiency: Different models in Data Sufficiency, Problems on data redundancy
Mensuration: Formulas for Areas, Formulas for Volumes of different solids, Problems on Areas, Problems on Volumes, and Problems on Surface Areas

Permutation and Combinations: Definition of permutation, Problems on Permutations, Definition of Combinations, Problems on Combinations

Probability: Definition of Probability, Problems on coins, Problems on dice, Problems on Deck of cards, Problems on Years

UNIT - III

Cubes: Basics of a cube, Formulae for finding volume and surface area of a cube, Finding the minimum number of cuts when the number of identical pieces are given, Finding the maximum number of pieces when cuts are given, Problems on painted cubes of same and different colors, Problems on cuboids, Problems on painted cuboids, Problems on diagonal cuts

Venn diagrams: Representing the given data in the form of a Venn diagram, Problems on Venn diagrams with two sets, Problems on Venn diagrams with three sets, Problems on Venn diagrams with four sets

Binary Logic: Definition of a truth-teller, Definition of a liar, Definition of an alternator, Solving problems using method of assumptions, Solving analytical puzzles using binary logic

UNIT - IV

Number and letter series: Difference series, Product series, Squares series, Cubes series, Alternate series, Combination series, miscellaneous series, Place values of letters.

Number and Letter Analogies: Definition of Analogy, Problems on number analogy, Problems on letter analogy, Problems on verbal analogy,

Odd man out: Problems on number Odd man out, Problems on letter Odd man out, Problems on verbal Odd man out

UNIT – V

Coding and decoding: Coding using same set of letters, Coding using different set of letters, Coding into a number, Problems on R-model

Direction sense: Solving problems by drawing the paths, finding the net distance travelled, finding the direction, Problems on clocks, Problems on shadows, Problems on damaged compass, Problems on direction sense using symbols and notations

Critical Reasoning: Problems on assumption, Problems on conclusions, Problems on inferences, Problems on strengthening and weakening of arguments, Problems on principle, Problems on paradox.

Lateral reasoning puzzle: Problems on common balance, Problems on digital balance, Problems on coins, Problems on lockers, Problems on heights, Digit puzzles using basic arithmetic operations.

TEXT BOOKS:

1. GL Barrons, Mc Graw Hills, Thorpe's verbal reasoning, LSAT Materials

2. R S Agarwal, S.Chand , 'A modern approach to Logical reasoning'

3. R S Agarwal, S Chand, 'Quantitative Aptitude'

4. Quantitative Aptitude - G. L BARRONS

5. Quantitative Aptitude - Abhijit Guha Mc Graw Hills

ONLINE REFERENCES:

1. www.careerbless.com/aptitude/qa/home.php

2. www.affairscloud.com/quantitative-aptitude-questions

3. www.careerafter.com/rs-aggarwal-quantitative-aptitude-pdf/

4. www.amazon.in/Quantitative-Aptitude-Competitive-Examinations.../8121924987

5. www.indiabix.com

6. www.practiceaptitudetests.com/numerical-reasoning-tests

III B.TECH   II SEMESTER

III B.Tech – II SEMESTER COURSE STRUCTURE

S. NO.	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	Cryptography and Network Security	PC	4	-	-	40	60	100	3
2	Data Warehousing and Data Mining	PC	4	-	-	40	60	100	3
3	Advanced Java and Web Technologies	PC	4	-	-	40	60	100	3
4	**Professional Elective – II:** 1. Advanced Computer Architecture 2. E-Commerce 3. Software Development Methodology 4. Wireless Networks & Mobile Computing 5. Dot Net Technologies	PE	4	-	-	40	60	100	3
5	**Open Elective – I:** **(See the List of Open Electives)**	OE	4	-	-	40	60	100	3
6	Free Open Source Software (FOSS) Python Lab	PC	-	-	3	25	50	75	2
7	Advanced Java and Web Technologies Lab	PC	-	-	3	25	50	75	2
8	Data Mining Lab	PC	-	-	3	25	50	75	2
9	Mini Project- II	PW	-	-	-	25	50	75	2
10	Advanced Communication Skills	MC	3	-	-	-	-	-	-
	Total		22	-	9	300	500	800	**23**

III B.TECH. II - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
CRYPTOGRAPHY & NETWORK SECURITY							

COURSE OBJECTIVES:

- The main objective of this course is to teach students to understand and how to address various software security problems in a secure and controlled environment.

- During this course the students will gain knowledge in various kinds of software security problems, and techniques that could be used to protect the software from security threats.

COURSE OUTCOMES:

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

CO 1: Summarize the fundamentals of Cryptography.
CO 2: Analyze how security is achieved and attacks can be countered by using symmetric/asymmetric algorithms.
CO 3: Apply Number Theoretic concepts in developing cryptographic algorithms to counter attacks.
CO 4: Interpret the role of hash functions and Digital Signatures in Information Security.
CO 5: Compare different network security designs using available secure solutions
CO 6: Illustrate the use of encryption techniques to secure data in transit across data networks.

SYLLABUS:

UNIT-I

Introduction: Security Attacks-Passive Attacks, Active Attacks, Security Services-Authentication, Access control, Confidentiality, Integrity, Availability service, Nonrepudiation, Security Mechanisms- Specific Security Mechanisms, Pervasive Security Mechanisms, model for Network Security, Basics of Cryptography - Symmetric Cipher Model, Substitution Techniques- Caesar Cipher, Monoalphabetic Ciphers, Playfair Cipher, Hill Cipher, polyalphabetic Ciphers, One-Time pad. Transposition Techniques-rail fence, Block and Stream Ciphers. Cyber threats and their defense (Phishing Defensive measures, SQL injection & Defense techniques) (TEXT BOOK 2),

UNIT-II

Symmetric Key Cryptography: Fiestel Cipher Structure, Block Cipher Design Principles-Design Criteria, Number of Rounds, Design of Function F, Data Encryption Standard (DES), Strength of DES, Triple DES, International Data Encryption algorithm(IDEA), AES- Structure, Transformation functions, Key Expansion, Block Cipher Modes of Operation- ECB, **CBC**, OFB,CFB,CTR Modes.

UNIT-III

Number Theory: Prime and Relatively Prime Numbers, Modular Arithmetic, Fermat's and Euler's Theorems-Proof and Examples, Euler's Totient Function, the Chinese Remainder Theorem, Primitive root and Discrete Logarithms.

Public Key Cryptography: Principles of Public key Cryptosystems-Public-Key Cryptosystems, Applications for Public-Key Cryptosystems, Requirements for Public-Key Cryptography, Public-Key Cryptanalysis, RSA Algorithm: Description of the Algorithm, The Security of RSA, Diffie-Hellman Key Exchange Algorithm, Elgamal encryption & decryption,

UNIT-IV

Cryptographic Hash Functions: Message Authentication Requirements and Functions-Message Encryption, Message Authentication Code, Hash Function, Message Authentication Codes (MAC)-Requirements, Security, Hash Functions-Requirements, Security, Applications of MAC and hash functions, Secure Hash Algorithm (SHA-512), HMAC&CMAC.

Digital Signatures: Digital Signature Schemes, Authentication Protocols- Mutual Authentication, One-Way Authentication, Digital Signature Standards-The DSS Approach, The digital Signature Algorithm.

UNIT-V

Authentication Applications: Kerberos: Motivation, Version 4, X.509 Directory Authentication service.

Electronic Mail Security: Pretty Good Privacy (PGP): Notation, Operational Description, S/MIME: RFC 5322, Multipurpose Internet Mail Extensions, S/MIME Functionality.

UNIT-VI

Web Security: Web Security Considerations, Secure Sockets Layer- SSL Architecture, SSL Record Protocol, Change Cipher Spec Protocol, Alert Protocol, Handshake Protocol, Transport Layer Security, Secure Electronic Transactions (SET).

System Security: Firewalls-Characteristics, Types of Firewalls, Placement of Firewalls, Firewall Configuration.

TEXTBOOKS:

1. Cryptography and Network Security: Principles and Practice,6th Edition, William Stallings, Pearson Education,2011.

2. Introduction to Computer Networks & Cyber Security, Chwan Hwa Wu, J.David Irwin, CRC Press, 2013.

REFERENCE BOOKS:

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press).

2. Principles of Information Security, Withman , Thomson.

3. Introduction to Cryptography, Buchmann, Springer.

4. Applied Cryptography, 2nd Edition, Bruce Schneier, Johnwiley&Sons.

5. Network Security Essentials and Cryptography, Benard Menezes, Cengage Learning,2011.

6. Cryptography and Network,2nd Edition, Behrouz A.Fourouzan and Debdeep Mukhopadhyay, McGraw-Hill,2010.

ONLINE 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

III B.TECH. II - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
DATA WAREHOUSING AND DATA MINING							

COURSE OBJECTIVES:

- Identify the scope and necessity of Data Mining & Warehousing for the society.
- Describe the design of Data Warehousing so that it can be able to solve the root problems.
- Categorize and carefully differentiate between situations for applying different data mining techniques: mining frequent pattern, association, correlation, classification, prediction, and cluster analysis.
- Evaluate the performance of different data mining algorithms.
- To develop further interest in research and design of new Data Mining Techniques.

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.

CO 2: Outline the need and importance of preprocessing techniques.

CO 3: Interpret data warehousing concepts and operations.

CO 4: Compare and contrast different dominant Data Mining Algorithms.

CO 5: Analyze the performance Association Rules.

SYLLABUS:

UNIT-I

Introduction to data mining: -What Is Data Mining, -Motivating Challenges, -The Origins of Data Mining, -Data Mining Tasks, -Types of Data: Attributes and Measurement, Types of Data Sets, -Data Quality: Measurement and Data Collection Issues, Issues Related to Applications.

UNIT-II

Data:- Data Preprocessing: Aggregation, Sampling, Dimensionality Reduction, Feature Subset Selection, Feature Creation, Discretization and Binarization, Variable Transformation, -Measures of similarity and dissimilarity: Basics, Similarity and Dissimilarity between Simple Attributes, Dissimilarities between Data Objects, Similarities between Data Objects, Examples of Proximity Measures.

Exploring data: -The Iris Data set, -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.

UNIT-III

Data Warehouse and OLAP Technology for Data Mining: -What is a Data Warehouse, -A Multidimensional Data Model: From tables to data cubes, Stars, snowflake, and fact constellations(schemas for multidimensional databases), Examples for defining star, snowflake, and fact constellation schemas, Measures(their categorization and computation), Introducing concept hierarchies, OLAP operations in the multidimensional data model, A starnet query model for querying multidimensional databases, -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, -Data Warehouse implementation: Efficient computation of data cubes, Indexing OLAP data, Efficient processing of OLAP queries, Metadata repository, 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), -From data warehousing to data mining: Data warehouse usage, From online analytical processing to online analytical mining.

UNIT-IV

Classification: Basic Concepts, Decision Trees, and Model Evaluation: -Preliminaries, -General Approach to Solving a Classification Problem, 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, -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.

Classification: alternative techniques: -Bayesian classifier: Bayes Theorem, Using Bayes theorem for classification, Naïve Bayesian classifier.

UNIT-V

Association Analysis: Basic Concepts and Algorithms: -Problem Definition, -Frequent Itemset Generation: The Apriori principle, Frequent Itemset Generation in the Apriori Algorithm, Candidate Generation and Pruning, Support Counting, -Rule Generation: Confidence-Based Pruning, -Compact Representation of Frequent Itemsets: Maximal Frequent Itemsets, Closed Frequent Itemsets, -FP-Growth algorithms: FP-Tree Representation, Frequent Itemset Generation in FP-Growth Algorithm.

Association Analysis: Advanced Concepts: -Handling Categorical Attributes, -Handling Continuous Attributes: Discretization-Based Methods, Statistics-Based Methods, Non-discretization Methods.

UNIT-VI

Cluster Analysis: Basic Concepts and Algorithms: -Overview: What is Cluster Analysis? Different Types of Clustering, Different Types of Clusters, -K-means: The Basic K-means Algorithm, K-means Additional Issues, Bisecting K-means, K-means and Different Types of Clusters, Strengths and Weaknesses, -Agglomerative Hierarchical Clustering: Basic Agglomerative Hierarchical Clustering Algorithm, Specific Techniques, -DBSCAN: Traditional Density (center based approach), The DBSCAN algorithm, Strengths and Weaknesses.

TEXT BOOKS:

1. Introduction to Data Mining: Pang-Ning tan, Michael Steinbach, Vipin kumar, Addision-Wesley.
2. Data Mining, Concepts and Techniques, 2/e, Jiawei Han, Micheline Kamber, Elsevier, 2006.

REFERENCE BOOKS:

1. Data Mining: Introductory and Advanced Topics, Margaret H Dunham, Pearson, 2008.
2. Introduction to Data Mining with Case Studies: GK Gupta; Prentice Hall.
3. Fundamentals of data warehouses, 2/e , Jarke, Lenzerini, Vassiliou, Vassiliadis, Springer.
4. Data Mining Theory and Practice, Soman, Diwakar, Ajay, PHI, 2006.

ONLINE REFERENCES:

1. https://onlinecourses.nptel.ac.in/noc18_cs14
2. www.oracle.com/Data/Warehousing
3. www.databaseanswers.org/data_warehousing.htm
4. https://www.wileyindia.com/data-warehousing-data-mining.html

III B.TECH-II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
ADVANCED JAVA AND WEB TECHNOLOGIES							

COURSE OBJECTIVES:

- To gain the knowledge of Server side programming languages and techniques associated with the World Wide Web.
- To make the students get acquainted the skill for developing web apps.
- Understand how to use web-based media-rich programming tools for creating dynamic web pages.

COURSE OUTCOMES:

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

CO5 : Interpret Servlet Life Cycle and web servers.

CO6 : Illustrate JSP Life cycle.

CO7 : Apply Session Management for JSP applications.

CO8 : Analyze the usage of JDBC in JSP applications.

CO9 : Analyze the web based applications in PHP.

SYLLABUS:

UNIT-I

Web Servers and Servlets: Tomcat web server, Introducing java Servlet, Introducing the servlet API, Lifecycle of a Servlet, Working with Initialization Parameters, Describing the HttpServlet Request & HttpServlet Response interfaces, Cookies, Session Tracking, Security Issues.

UNIT-II

Introduction to JSP: The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC.JSP Application Development: Generating Dynamic Content: directive elements, what is template text, action elements. Using Scripting Elements, Implicit JSP Objects. Conditional Processing: Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods.

UNIT-III

JSP: Error Handling and Debugging, Implicit JSP Objects, Sharing Data between JSP pages, Requests, and Users Passing Control and Data between Pages: passing the control between the pages, passing the data between JSP pages passing the data between JSP pages using session object, Memory Usage Considerations.

UNIT-IV

JDBC: Introduction, Database Programming Using JDBC: How JDBC Works, JDBC Architecture, JDBC Driver Types; Studying javax.sql.*package, Accessing Database From JSP page: Use of Prepared Statement, ResultSet.

UNIT-V

PHP: Introduction to PHP, Creating PHP script, Running PHP script. Working with variables and constants, Data types, Operators. Controlling program flow, Working with Arrays, Built-in functions in PHP, user-defined functions in PHP, recursive, variable, and callback functions.

UNIT-VI

User and Database Interface: Database programming, Working with forms, validating a form, Working with Databases such as MySQL, Oracle, SQL Server.

TEXTBOOKS:

1. Web technologies –A.A. Puntambekar , Technical Publications, Pune.
2. WebTechnologies-Black Book , Kognent Learning Solutions Inc Sol. DreamtTech Press

REFERENCES:

1. An Introduction to Web Design and Programming –Wang Thomson.
2. An Introduction to Web Design + Prgramming Wang, Katila CENGAGE.
3. Web Technologies A Developer's Perspective, N.P.Gopalan , Akhilandeswari, PHI.

ONLINE REFERENCES:

1. https://www.coursera.org/learn/html-css-javascript-for-web-developers.
2. https://www.coursera.org/learn/web-applications-php.
3. https://www.udemy.com/javawebtut/.
4. https://www.coursera.org/learn/desenvolvimento-agil-com-java-avancado/lecture/LUXm0/criando-java-servlets.

III B.TECH. II - SEMESTER (Professional Elective-II)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
ADVANCED COMPUTER ARCHITECTURE							

COURSE OBJECTIVES:

- To be familiar with Computer design, RISC, CISC instruction sets.
- To understand Cache Coherence and Message Passing Mechanisms.
- To know the Different trends in parallelism.

COURSE OUTCOMES:

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

CO 1: Analyze the architectures of MIMD, SIMD and super computers.

CO 2: Compare the RISC and CISC architectures

CO 3: Interpret various models of Linear and Non Linear pipeline Processors.

CO 4: Compare the Cache coherence issues

CO 5: Analyze message passing mechanisms.

CO 6: Compare different forms of parallelism in parallel systems**.**

SYLLABUS:

UNIT -I
Parallel Computer: The state of computing- Computer Development Milestones, Elements of Modern Computers, Evolution of Computer Architecture, System Attributes to performance; Multiprocessors and Multicomputer-Shared Memory Multiprocessors, Distributed Memory Multiprocessors, A Taxonomy of MIMD Computers; Multivector and SIMD Computers-Vector Super computers, SIMD Supercomputers.

UNIT–II
Processor and Memory Hierarchy: Design space of processors, Instruction-set Architectures, Characteristics of typical CISC and RISC Architecture, Hierarchical Memory Technology, Inclusion, Coherence and Locality.

UNIT-III
   Linear and Nonlinear Pipeline Processors: Asynchronous and Synchronous models, Clocking and Timing control, Speedup, Efficiency and Throughput; Nonlinear pipeline processors: Reservation and Latency analysis-Problems, Collision Free Scheduling-problems, Instruction Execution Phases.

UNIT–IV
   Cache Coherence and Message Passing Mechanisms: Cache Coherence problem-Two protocol approaches, Snoopy Bus Protocols, Directory based Protocols; Message Passing

Mechanisms- Message-Routing Schemes, Deadlock Virtual Channels, Flow Control Strategies, Multicast Routing Algorithms.

UNIT –V

SIMD and MIMD Computer Organizations: Implementation models, The CM-2 Architecture; A Synchronized MIMD Machine, Control Processors and Processing Nodes, Interprocessor Communications.

UNIT–VI

Trends in Parallel Systems: Forms of Parallelism- Structural Parallelism versus Instruction Level Parallelism, a Simple Parallel Computation, Parallel Algorithms, Stream Processing; Cray Line of Computer Systems.

TEXT BOOK:

1. KAI HWANG & NARESH JOTWANI "Advanced Computer Architecture- Parallelism, Scalability, Programmability" Second Edition, Mc Graw Hill Publishing.

REFERENCES:

1. John L. Hennessy, David A. Patterson - Computer Architecture: A Quantitative Approach, 3rd Edition, An Imprint of Elsevier.

2. Dezso Sima, Terence Fountain, Peter Kacsuk, "Advanced Computer Architecture – A Design Space Approach", Pearson Ed.

ONLINE REFERENCES:

1. https://www.sanfoundry.com/best-reference-books-advanced-computer-architecture/
2. https://www.youtube.com/watch?v=YVObWiciVgw
3. cse.unl.edu/~jiang/cse430/index.htm
4. https://www.youtube.com/watch?v=pb1GOwgui14

III B.TECH. II - SEMESTER (Professional Elective-II)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
E-COMMERCE							

COURSE OBJECTIVES:

- To introduce the fundamental principles of e-business, e-commerce and the role of management.
- To introduce the application of tools and services to the development of small scale e-commerce applications.

COURSE OUTCOMES:

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

CO 1: Interpret the E-commerce applications and Process Models

CO 2: Compare and contrast various electronic Payment Systems

CO 3: Interpret the Intra Organizational Commerce.

CO 4: Outline the corporate digital library and marketing research.

CO 5: Analyze resource discovery and information filtering.

SYLLABUS:

UNIT - I

Electronic Commerce-Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications.

UNIT - II

Consumer Oriented Electronic commerce - Mercantile Process models.

UNIT - III

Electronic payment systems - Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems.

UNIT-IV

Intra Organizational Commerce - work Flow, Automation Customization and internal Commerce, Supply chain Management.

UNIT – V

Corporate Digital Library - Document Library, digital Document types, corporate Data Warehouses.Advertising and Marketing - Information based marketing, Advertising on Internet, on-line marketing process, market research.

UNIT - VI

Consumer Search and Resource Discovery - Information search and Retrieval, Commerce Catalogues, Information Filtering. Digital Video and electronic Commerce

TEXT BOOK :

1. Frontiers of electronic commerce – Kalakata, Whinston, Pearson.

REFERENCES :

1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley.
2. E-Commerce, S.Jaiswal – Galgotia.
3. E-Commerce, Efrain Turbon, Jae Lee, David King, H.Michael Chang.
4. Electronic Commerce – Gary P.Schneider – Thomson.
5. E-Commerce – Business, Technology, Society, Kenneth C.Taudon, Carol Guyerico Traver.

ONLINE REFERENCES:

1. https://www.edx.org/learn/ecommerce
2. http://www.oxfordhomestudy.com/courses/online-management-courses/e-commerce-online-course

III B.TECH. II - SEMESTER (Professional Elective-II)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3

SOFTWARE DEVELOPMENT METHODOLOGY

COURSE OBJECTIVES:

- To develop a broad and critical understanding of all the processes for engineering high quality software and the principles, concepts and techniques associated with software development.

COURSE OUTCOMES:

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

CO 1: Outline basics of software engineering and software process models.
CO 2: Identify the role of software requirements in software engineering.
CO 3: Interpret different software architecture design methods.
CO 4: Compare and contrast design processes and strategies.
CO 5: Interpret object based design, component based design and testing processes.
CO 6: Summarize the risk, schedule and project management in software development.

SYLLABUS:

UNIT - I

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, legacy software, Software myths.

A Generic view of process: Software engineering - A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process.

UNIT - II

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document. Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management. System models: Context Models, Behavioral models, Data models, Object models, structured methods.

UNIT - III

Software Design: The nature of the design process, transferring design knowledge, constraints upon the design process and product, recording design decisions, designing with others, context for design, economic factors, assessing design qualities, quality attributes of the design product,

assessing the design process. Representing abstract ideas, design view points, the architecture concept, design methods, design patterns, design representations, rationale for design methods.

UNIT - IV

Design Processes and Strategies: The role of strategy in design methods, describing the design process – The D – Matrix, design by top-down decomposition, design by composition, and organizational influences upon design.

UNIT - V

Designing with objects: Design practices for object-oriented paradigm, Object-oriented paradigm, Object-oriented frame works, Hierarchical object oriented design process and heuristics, the fusion method, the unified process.

Component - based design: The component concept, designing with components, designing components, COTS.

Testing Strategies: Testing strategies for conventional software, Black-box, White-box and art of debugging.

UNIT - VI

Metrics for Process and Products: Software Measurement, Metrics for software quality.

Project Management: The management spectrum: people, product, process and project, W5HH principle.

Project Scheduling: Basic concepts, project scheduling, defining a task set and task network, timeline charts, tracking the schedule, tracking the progress for an OO project, Earned value analysis.

Risk Management: Reactive vs. Proactive risk strategies, software risks, RMMM plan.

TEXT BOOKS:

1. Software design, David Budgen, second edition, Pearson education, 2003.

2. Software Engineering: A practitioner's Approach, Roger S Pressman, sixth edition. McGraw

   Hill International Edition, 2005.

3. Software Engineering, Ian Sommerville, seventh edition, Pearson education, 2004.

REFERENCE BOOKS:

1. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
2. Software Engineering : A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008.
3. Fundamentals of Software Engineering, Rajib Mall,PHI, 2005.
4. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
5. Software Engineering1: Abstraction and modeling, Diner Bjorner, Springer International edition, 2006.
6. Software Engineering2: Specification of systems and languages, Diner Bjorner, Springer International edition, 2006.
7. Software Engineering Foundations, Yingxu Wang, Auerbach Publications, 2008.

8. Software Engineering 3: Domains, Requirements and Software Design, D.Bjorner, Springer, International Edition.
9. Software Engineering Principles and Practice, Hans Van Vliet,3rd edition, Wiley India edition.
10. Introduction to Software Engineering, R.J.Leach,CRC Press.
11. Software Engineering Fundamentals, Ali Behforooz and Frederick J.Hudson, Oxford University Press, rp2009.
12. Software Engineering Handbook, Jessica Keyes, Auerbach, 2003.

ONLINE REFERENCES:

1. https://www.youtube.com/watch?v=3118sJuwOLs
2. https://www.youtube.com/watch?v=aX4_s5_Hroc
3. https://www.youtube.com/watch?v=LbBoUjW2Fgs
4. https://www.youtube.com/watch?v=Wpy1jOm9Vbw
5. https://www.udemy.com/software-development-from-a-to-z/
6. https://www.coursera.org/learn/software-processes/lecture/wZprO/what-software-development-looks-like

III B.TECH. II - SEMESTER (Professional Elective-II)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
WIRELESS NETWORKS AND MOBILE COMPUTING							

COURSE OBJECTIVES:

- To make the student understand the concept of mobile computing paradigm, its applications and limitations.
- To understand the typical mobile networking infrastructure through GSM
- To understand the issues and solutions of various layers of mobile networks, namely MAC layer, Network Layer & Transport Layer
- To understand the ad hoc networks and related concepts.

COURSE OUTCOMES:

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

CO 1: Compare the various types of Wireless Networks from teaching perspective.
CO 2: Interpret the applications and architecture of Mobile Computing and multiplexing techniques
CO 3: Analyze the Mobile IP issues
CO 4: Analyze the various Mobile TCP Variants
CO 5: Analyze the various routing protocols in MANET

SYLLABUS:

UNIT– I

Wireless Networks: Computing Networks, types of networks, wired networks, wireless networks, Generation of Wireless Networks: 2G, 3G, 4G, Cellular Networks, Mobile Ad Hoc Networks, Mesh Networks, Sensor Networks, Vehicular Adhoc Networks, Next Generation Networks

UNIT–II

Mobile Computing: Architecture of Mobile Computing, Mobile Computing Applications, Limitations of Mobile Devices

GSM: Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS.

UNIT–III

(Wireless) Medium Access Control (MAC): Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

UNIT–IV

Mobile Network Layer: Mobile IP- Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunnelling and encapsulation, optimizations, Dynamic Host Configuration Protocol (DHCP).

UNIT-V

Mobile Transport Layer : Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

UNIT-VI

Mobile Ad hoc Networks (MANETs): Introduction, Characteristics, Applications & Challenges of a MANET, Routing, Proactive, Reactive and Hybrid Routing Algorithms.

TEXT BOOKS:

1. Jochen Schiller, "Mobile Communications", Addison-Wesley, 2nd edition, 2004.
2. Rajkamal, "Mobile computing" Second Edition ,Oxford University Press

REFERENCE BOOKS:

1. Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", Wiley, 2002, ISBN 0471419028.
2. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden ,Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", ISBN: 0071412379, McGraw- Hill Professional, 2005.
3. Hansmann, Merk, Nicklous, Stober, "Principles of Mobile Computing", Springer, second edition, 2003.
3. MartynMallick, "Mobile and Wireless Design Essentials", Wiley DreamTech, 2003

ONLINE REFERENCES:

1. https://www.youtube.com/watch?v=bdKZQ2mUzlY
2. https://www.youtube.com/watch?v=WtRpFLx34BY
3. https://www.youtube.com/watch?v=AyvnhiB0-Bw
4. https://www.youtube.com/watch?v=f7jULYEC9IE
5. https://www.youtube.com/watch?v=MFdQvlnptsM

III B.TECH. II - SEMESTER (Professional Elective-II)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
.NET TECHNOLOGIES							

COURSE OBJECTIVES:

- To enlighten the student with knowledge base in .NET Applications Development.

COURSE OUTCOMES:

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

CO 1: Interpret the basic concepts of object oriented programming through C#.

CO 2: Apply components of .NET framework in C# programming.

CO 3: Make use of various .NET controls in application development.

CO 4: Apply data binding methods and deployment procedures in application development.

CO 5: Outline the web services and MVC concepts.

SYLLABUS:

UNIT - I

An Overview of .NET Framework: Architecture of .NET framework 4.5, Common Language Runtime (CLR), .NET Framework Class Library, ASP.NET support to Internet development, ADO.NET to support database application, Language supported by .NET

UNIT - II

An Introduction to c#: Basic Program Structure, Control Structures, Arrays, ArrayList, Collection, OOP features-Classes, Object, Data members, Data Methods, Abstraction, Encapsulation, Inheritance, Polymorphism, Abstract class, sealed class, class instances.

UNIT - III

Interfaces, Namespaces, Attributes, AttributeList, Assemblers, types of assemblers, Generics, Indexers, delegates and Exception handling, Properties.

UNIT - IV

ASP.NET: Introduction to asp.Net, Standard Controls, Validation Controls, Data Controls, Debugging, Master Page, Styles, Themes, Skin Files, site navigation

UNIT – V

ADO.NET: ADO.NET Architecture, using objects of Connection, Command, DataReader, DataAdapter, DataSet, DataTable, Data Source and Data Bound Controls, State Management

UNIT - VI

Extensible Markup Language(XML), LINQ, Lambda expressions, LINQ to SQL, LINQ to Object, Entity Framework, Files and streams, AJAX Controls. Deploying ASP.NET Application, Working with Web Services, Introduction to MVC.

TEXT BOOKS:

1. Introduction to C# using .NET – ROBERT J. OBERG
2. Professional ASP.NET 4.5 in C# and VB.

REFERENCES:

1. C# 4.0: The Complete Reference
2. Beginning ASP.NET 4.5 in C#

ONLINE REFERENCES:

1. https://www.edx.org/course/programming-c-microsoft-dev204x-3
2. https://www.youtube.com/watch?v=5Zgj7X7l_Dk&list=PL6n9fhu94yhWjzB2ss5SPaEUboyJAx-XM
3. https://www.youtube.com/watch?v=3AYoipyqOkQ&list=PL6n9fhu94yhXQS_p1i-HLIftB9Y7Vnxlo

III B.TECH. II - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	-	-	3	25	50	75	2

FREE OPEN SOURCE SOFTWARE (FOSS) PYTHON LAB

COURSE OBJECTIVES:

- To introduce students the open source software.
- To understand why Python is a useful scripting language for developers.
- To learn how to design and program Python applications.

COURSE OUTCOMES:

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

CO 1: Develop python applications using strings, functions and Files.

CO 2: Demonstrate the use of Python lists and dictionaries.

CO 3: Make use of Object Oriented Programing concepts to develop python programs.

CO 4: Experiment with GUI based python programs.

LIST OF EXPERIMENTS

1. BASICS

a) Running instructions in Interactive interpreter and a Python Script.

b) Write a program to purposefully raise Indentation Error and Correct it.

2. OPERATIONS

a) Write a program to compute distance between two points taking input from the user

   (Pythagorean Theorem)

b) Write a program add.py that takes 2 numbers as command line arguments and prints its sum.

3. CONTROL FLOW

a) Write a Program for checking whether the given number is a even number or not.

b) Using a for loop, write a program that prints out the decimal equivalents of 1/2, 1/3, 1/4, ….

   ……..,1/10

c) Write a program using a for loop that loops over a sequence. What is sequence ?

d) Write a program using a while loop that asks the user for a number, and prints a countdown from that number to zero.

4. CONTROL FLOW - CONTINUED

a) Find the sum of all the primes below two million.

Each new term in the Fibonacci sequence is generated by adding the previous two terms. By

starting with 1 and 2, the first 10 terms will be:

1, 2, 3, 5, 8, 13, 21, 34, 55, 89, ...

b) By considering the terms in the Fibonacci sequence whose values do not exceed four million,

find the sum of the even-valued terms.

5. DS

a) Write a program to count the numbers of characters in the string and store them in a dictionary data structure

b)Write a program to use split and join methods in the string and trace a birthday with a dictionary data structure.

6. DS - CONTINUED

a) Write a program combine_lists that combines these lists into a dictionary.

b) Write a program to count frequency of characters in a given file. Can you use character frequency to tell whether the given file is a Python program file, C program file or a text file?

7. FILES

a) Write a program to print each line of a file in reverse order.

b) Write a program to compute the number of characters, words and lines in a file.

8. FUNCTIONS

a) Write a function ball_collide that takes two balls as parameters and computes if they are colliding. Your function should return a Boolean representing whether or not the balls are colliding.

Hint: Represent a ball on a plane as a tuple of (x, y, r), r being the radius

If (distance between two balls centers) <= (sum of their radii) then (they are colliding)

b) Find mean, median, mode for the given set of numbers in a list.

9. FUNCTIONS - CONTINUED

a) Write a function nearly_equal to test whether two strings are nearly equal. Two strings a and b are nearly equal when a can be generated by a single mutation on b.

b) Write a function dups to find all duplicates in the list.

c) Write a function unique to find all the unique elements of a list.

10. FUNCTIONS - PROBLEM SOLVING

a) Write a function cumulative_product to compute cumulative product of a list of numbers.

b) Write a function reverse to reverse a list. Without using the reverse function.

c) Write function to compute gcd, lcm of two numbers. Each function shouldn't exceed one line.

11. MULTI-D LISTS

a) Write a program that defines a matrix and prints

b) Write a program to perform addition of two square matrices

c) Write a program to perform multiplication of two square matrices

12. MODULES

a) Install packages requests, flask and explore them. using (pip)

b) Write a script that imports requests and fetch content from the page. Eg. (Wiki)

c) Write a simple script that serves a simple HTTPResponse and a simple HTML Page

13. OOP

a) Class variables and instance variable

      i) Robot

      ii) ATM Machine

14. GUI, GRAPHICS

1. Write a GUI for an Expression Calculator using tk
2. Write a program to implement the following figures using turtle
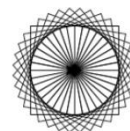
15. Testing

a) Write a test-case to check the function even_numbers which return True on passing a list of all even numbers
b) Write a test-case to check the function reverse_string which returns the reversed string

16. Advanced

a) Build any one classical data
b) Write a program to solve knapsack problem.
c) Write a program using django web application framework.

ONLINE REFERENCES:

    1. https://www.edx.org/course/subject/computer-science/python
    2. https://www.edureka.co/python

III B.TECH-II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	-	-	3	25	50	75	2
ADVANCED JAVA AND WEB TECHNOLOGIES LAB							

COURSE OBJECTIVES:

- Gain the knowledge of Server side programming languages and techniques associated with the World Wide Web.
- Understand how to use Server side scripting for creating dynamic web pages.

COURSE OUTCOMES:

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

CO1 : Experiment with the installation of Web Servers.

CO2 : Make use of servlets in dynamic web pages.

CO3 : Develop web applications using JSP for effective data management.

CO4 : Construct the web based applications in PHP using effective data base access with rich client interaction.

LIST OF EXPERIMENTS
1. Install TOMCAT webserver and Apache- MySQL.
2. Write a servlet program which receives data from HTML forms and respond it.
3. Create one Servlet to retrieve "ServletContext Initialization Parameters " which you have given in the web.xml file.
4. Write a servlet program to authenticate four users using cookies.
5. Write a servlet that, on entry of a *student rollno*, displays the full details of that students details(Using student table with rollno,Name,Address,date of birth, course fields).
6. Write JSP program to register a student using registration form using student table.
7. Write JSP program for authenticating user by his password using login form. Create suitable tables.
8. Create table to store the details of book(book name, price, author, publisher) and extract data from table and display all books using JSP and JDBC.
9. Write PHP programs that uses arrays and functions in PHP.
10. Write example PHP program for creating login form and validate users.
11. Write example PHP program for to display all students in cse using student table.
12. Create tables in database which contains the details of book .Extract data from tables and display them using PHP.

ONLINE REFERENCES:

1. https://www.coursera.org/learn/html-css-javascript-for-web-developers
2. https://www.coursera.org/learn/web-applications-php
3. https://www.udemy.com/javawebtut/
4. https://www.coursera.org/learn/desenvolvimento-agil-com-java-avancado/lecture/LUXm0/criando-java-servlets.

III B.TECH-II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	-	-	3	25	50	75	2
DATA MINING LAB							

COURSE OBJECTIVES:

- Exposure to real life data sets for analysis and prediction.
- Practical exposure on implementation of well-known data mining tasks.
- Learning performance evaluation of data mining algorithms in a supervised and an unsupervised setting.
- Handling a small data mining project for a given practical domain.

COURSE OUTCOMES:

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

CO 1: Apply data preprocessing techniques on the given data.

CO 2: Construct classification model for the given data.

CO 3: Identify Association Rules for the given data.

CO 4: Apply the clustering techniques on the given data.

LIST OF EXPERIMENTS

1. Demonstration of preprocessing on dataset student.arff
2. Demonstration of preprocessing on dataset labor.arff
3. Demonstration of Association rule process on dataset contactlenses.arff using apriori algorithm
4. Demonstration of Association rule process on dataset test.arff using apriori algorithm
5. Demonstration of classification rule process on dataset student.arff using j48 algorithm
6. Demonstration of classification rule process on dataset employee.arff using j48 algorithm
7. Demonstration of classification rule process on dataset employee.arff using id3 algorithm
8. Demonstration of classification rule process on dataset employee.arff using naïve bayes algorithm
9. Demonstration of clustering rule process on dataset iris.arff using simple k-means
10. Demonstration of clustering rule process on dataset student.arff using simple k- means

ONLINE REFERENCES:

1. https://weka.waikato.ac.nz/dataminingwithweka/preview
2. https://www.class-central.com/tag/weka

III B.TECH. II - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	0	25	50	75	2

MINI PROJECT - II

COURSE OBJECTIVES:

- To offer students a glimpse into real world problems and challenges that need IT based solutions.
- To enable students to create very precise specifications of the IT solution to be designed.
- To enable students to use concepts of IT in creating a solution for a problem
- To improve the team building, communication and management skills of the students.

COURSE OUTCOMES:
After successful completion of this course student will be able to:

CO1: Acquire practical knowledge within the chosen area of technology for project development.
CO2: Identify, analyze, formulate and handle programming projects with a comprehensive and systematic approach.
CO3: Contribute as an individual or in a team in development of technical projects.
CO4: Develop effective communication skills for presentation of project related activities.

The student will do Mini Project - II during inter semester break of III B.Tech first semester and III B.Tech second semester. It will be evaluated at the end of III B.Tech Second semester as per academic regulation. The main intention of Mini Project is to make student enable to apply the knowledge and skills learned out of courses studied and any other technology whatever he/she is interested to solve problem. The Mini Project may be beyond the scope of curriculum of courses taken or may be based on the courses but thrust should be on

> ➢ Learning additional skills
> ➢ Development of ability to define and design the problem and lead to its accomplishment with proper planning.
> ➢ Learn the behavioral science by working in a group

1. Batch Formation:
   The same batch of Mini Project – I will continue for the Mini Project – II also. If any student wants to change the batch he/she can request project review committee (PRC). If possible project review committee can take required action.
2. Guide Allotment:
   If any guide who was allotted for Mini Project-I is not available, the batch can select a new guide with the consent of HOD.
3. Internal Evaluation of the Mini project-II
   PRC will organize project seminar and final execution of the project. Out of 25 internal marks, 15 marks for execution of the project and 10 marks for project Presentation.
4. External Evaluation of Mini Project - II:
   For external viva the evaluation committee consists of external examiner, guide & HOD. This viva is conducted for 50 marks.

III B.TECH. II - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	0	0	0	0	0	0
ADVANCED COMMUNICATION SKILLS							

COURSE OBJECTIVES:

- To make the students understand the importance of Non-Verbal communication
- Train the students to use the language effectively to face interviews, Group Discussions.
- To develop effective written communication in academic, technical and professional contexts.
- Develop critical thinking skills necessary to become employable.

COURSE OUTCOMES:

After successful completion of this course student will be able to:

CO 1: Use English language fluently, accurately and appropriately.
CO 2: Know how body language is used in communication and interpret non-verbal symbols
CO 3: Understand the nuances of the written language and write technical reports effectively.
CO 4: Participate in Group discussions and interviews.

SYLLABUS:

UNIT – I

Non-Verbal Communication

UNIT – II

Resume Preparation

UNIT – III

E-mail writing & Professional Letter writing

UNIT – IV

Essay Writing & Paragraph writing

UNIT - V

Group discussion

UNIT – VI

Interview skills

REFERENCES:

1. Essentials of Business Communication, Rajendra Pal, J S KorlahaHi, Sultan Chand & Sons

2. Basic Communication Skills for Technology, Andrea J. Rutherford, Pearson Education Asia

3. Advanced Communication Skills, V. Prasad, Atma Ram Publications

4. Business Communication, Theory & Application. Raymond. Lesikav, John D. Pettir Jr. All India Traveller Bookseller

5. Business Communication, RK Madhukar, Vikas Publishing House Pvt Ltd.

6. The Human Touch: Personal Skills for Professional Success- By Debra Paul.

7. Personality Development and Soft Skills, Barun K. Mitra, Oxford University Press

8. Technical Communication Principles and Practice, Meenakshi Raman, Sangeeta Sharma, Oxford University Press

9. Communication Skills, Sanjay Kumar, Pushp Lata, Oxford University Press

10. Fundamentals of Technical Communication, Meenakshi Raman, Sangeeta Sharma, Oxford University Press

IV B.TECH I SEMESTER

IV B.Tech – I SEMESTER COURSE STRUCTURE

S. NO.	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	Internet of Things	PC	4	-	-	40	60	100	3
2	Big Data Analytics	PC	4	-	-	40	60	100	3
3	**Professional Elective – III:** 5. Distributed Operating Systems 6. Business Intelligence 7. Software Testing Methodology 8. High Speed Networks	PE	4	-	-	40	60	100	3
4	**Professional Elective – IV:** 6. High Performance Computing 7. Machine Learning 8. Software Process and Project Management 9. Mobile Ad-hoc and Sensor Networks 10. Programming with Ruby	PE	4	-	-	40	60	100	3
5	**Open Elective – II (See the List of Open Electives)**	OE	4	-		40	60	100	3
6	Mobile Application Development Lab	PC	-	-	3	25	50	75	2
7	**Professional Skill based Lab** CCNA- I / Oracle DBA / SQL DBA	PC	-	-	3	25	50	75	2
8	IOT Lab	PC	-	-	3	25	50	75	2
9	Big Data Analytics Lab	PC	-	-	3	25	50	75	2
10	MOOCS	MC	-	-	-	-	-	-	-
	Total		20	-	12	300	500	800	**23**

IV B.TECH. I - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
INTERNET OF THINGS							

COURSE OBJECTIVES:

- To understand this fundamentals of Internet of Things.
- To build a small low cost embedded system using Arduino / Raspberry Pi or equivalent boards.
- To apply the concept of Internet of Things in the real world scenario

COURSE OUTCOMES:

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

CO 1: Outline the concepts of Internet of Things.

CO 2: Analyze the requirements, specifications to design IoT applications.

CO 3: Analyze domain specific applications using Arduino and Raspberry pi.

CO 4: Interpret cloud storage models and communication APIs for IoT.

SYLLABUS:

UNIT - I

FUNDAMENTALS OF IoT INTRODUCTION: Characteristics-Physical design - Protocols – Logical design – Enabling technologies– IoT Levels and Deployment Templates – M2M, IoT vs M2M.

UNIT - II

IoT DESIGN METHODOLOGY: Purpose & Requirements Specification, Process Specification, Domain Model Specification, Information Model Specification, Service Specification, IoT Level Specification, Functional View Specification, Operational View specification, Device & Component Integration and Application Development.

UNIT - III

PROTOTYPING EMBEDDED DEVICE WITH ARDUINO: Sensors, Actuators, Embedded Computing Basics- Micro Controllers, System on Chips, Choosing your Platform, Arduino – Developing on the Arduino.

UNIT – IV

PROTOTYPING EMBEDDED DEVICE WITH RASPBERRY PI: Raspberry PI – Introduction, cases and Extension Boards, Developing on the Raspberry PI.

UNIT – V

IOT Physical Servers & Cloud Offerings: Introduction to Cloud Storage Models & Communication APIs – WAMP – AutoBahn for IoT, Xively Cloud for IoT.

UNIT – VI

DOMAIN SPECIFIC APPLICATIONS OF IoT: Home Automation, Agriculture Applications, Smart City applications.

TEXT BOOKS:

1. Arshdeep Bahga, Vijay Madisetti, "Internet of Things – A hands-on approach", Universities Press, 2015.
2. Adrian McEwen & Hakim Cassimally, "Designing the Internet of Things", Wiley Publications – 2014.

REFERENCES:

1. Marco Schwartz, "Internet of Things with the Arduino Yun", Packt Publishing, 2014.
2. Manoel Carlos Ramon, "Intel® Galileo and Intel® Galileo Gen 2: API Features and Arduino Projects for Linux Programmers", Apress, 2014.
3. Waltenegus Dargie,Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice".
4. Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-on-Approach)",
   1st Edition, VPT, 2014.
5. Charalampos Doukas "Building Internet of Things with the Arduino".
6. Francis daCosta, "Rethinking the Internet of Things: A ScalableApproach to Connecting Everything", 1st Edition, Apress Publications, 2013.
7. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1stEdition, Academic Press, 2014.

ONLINE REFERENCES:

1. https://www.youtube.com/watch?v=G4-CtKkrOmc
2. http://www.cse.wustl.edu/~jain/cse570-13/m_18iot.htm
3. https://www.youtube.com/watch?v=9ZUFYyXhQm8
4. https://www.udemy.com/introduction-to-iot-using-raspberry-pi-2/

IV B.TECH. I - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
BIG DATA ANALYTICS							

COURSE OBJECTIVES:

- Introducing Java concepts required for developing map reduce programs.
- Optimize business decisions and create competitive advantage with Big Data analytics.
- Derive business benefit from unstructured data.
- Imparting the architectural concepts of Hadoop and introducing map reduce paradigm.
- To introduce programming tools PIG & HIVE in Hadoop echo system.

COURSE OUTCOMES:

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

CO1: Interpret the architectural elements of big data and Hadoop framework.
CO2: Analyse various big data applications using map reduce programming module.
CO3: Analyse Spark capabilities such as distributed datasets, in-memory caching, and the interactive shell.
CO4: Summarize Spark's powerful built-in libraries, including Spark SQL, Spark Streaming.
CO5: Analyze Hadoop data with PIG and Hive.

SYLLABUS:

UNIT-I

Starting Hadoop: -Google File System, -The building blocks of Hadoop: Namenode, Datanode, Secondary Namenode, JobTracker, TaskTracker. -Setting up SSH for a Hadoop cluster: Define a common account, Verify SSH installation, Generate SSH key pair, Distribute public key and validate logins. - Running Hadoop: Local (standalone) mode, Pseudo-distributed mode, Fully distributed mode.

UNIT-II

MapReduce: -A Weather Dataset: Data Format, -Analyzing the Data with Hadoop: Map and Reduce, Java MapReduce: A test run, The old and the new Java MapReduce APIs.

Basic programs of Hadoop MapReduce: Driver code, Mapper code, Reducer code, RecordReader, Combiner, Partitioner.

UNIT-III

Programming with RDDs: What Is Apache Spark, RDD Basics, Creating RDDs, RDD Operations, Passing Functions to Spark, Common Transformations and Actions, Persistence (Caching).

Loading and Saving Your Data: File Formats, File systems, Structured Data with Spark SQL, Databases

UNIT-IV

Spark SQL: Linking with Spark SQL, Using Spark SQL in Applications, Loading and Saving Data, JDBC/ODBC Server, User-Defined Functions

Working with Key/Value Pairs: Creating Pair RDDs, Transformations on Pair RDDs, Actions Available on Pair RDDs

UNIT-V

Pig: Hadoop Programming Made Easier: -Admiring the Pig Architecture, -Going with the Pig Latin Application Flow, -Working through the ABCs of Pig Latin: Uncovering Pig Latin structures, Looking at Pig data types and syntax. -Evaluating Local and Distributed Modes of Running Pig Scripts, -Checking out the Pig Script Interfaces, -Scripting with Pig Latin

UNIT-VI

Applying Structure to Hadoop Data with Hive: -Saying Hello to Hive, -Seeing How the Hive is Put Together, -Getting Started with Apache Hive, -Examining the Hive Clients: The Hive CLI client, The web browser as Hive client, SQuirreL as Hive client with the JDBC Driver. -Working with Hive Data Types, -Creating and Managing Databases and Tables: Managing Hive databases, Creating and managing tables with Hive. -Seeing How the Hive Data Manipulation Language Works: LOAD DATA examples, INSERT examples, Create Table As Select (CTAS) examples. -Querying and Analyzing Data: Joining tables with Hive, Improving your Hive queries with indexes, Windowing in HiveQL, Other key HiveQL features.

TEXT BOOKS:

1. Hadoop: The Definitive Guide by Tom White, 3rd Edition, O'Reilly Media.
2. Learning Spark by Matei Zaharia, Holden Karau, Andi Konwinski, Patric Wendell, O'Reilly Media,2015.
3. Hadoop in Action by Chuck Lam, MANNING Publ.
4. Hadoop for Dummies by Dirk deRoos, Paul C.Zikopoulos, Roman B.Melnyk,Bruce Brown, Rafael Coss.

REFERENCE BOOKS:

1. Hadoop in Practice by Alex Holmes, MANNING Publ.
2. Hadoop MapReduce Cookbook, Srinath Perera, Thilina Gunarathne

ONLINE REFERENCES:

1. https://www.edx.org/learn/big-data
2. https://www.edureka.co/big-data-and-hadoop

IV B.TECH. I – SEMESTER (Professional Elective-III)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3

DISTRIBUTED OPERATING SYSTEMS

COURSE OBJECTIVES:

- The aim of this subject is to study, learn, and understand the main concepts of advanced operating systems (parallel processing systems, distributed systems, real time systems, network operating systems, and open source operating systems);
- To learn Hardware and software features that supports these systems.

COURSE OUTCOMES:

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

CO 1. Outline the potential benefits of distributed systems
CO 2. Interpret synchronization techniques in distributed systems.
CO 3. Analyze various distributed deadlock detection and prevention techniques.
CO 4. Summarize process scheduling techniques, threads and fault tolerance in distributed environments.
CO 5. Interpret distributed file system implementations and shared memory.
CO 6. Relate distributed system functions in MACH and DCE.

SYLLABUS:

UNIT–I

Introduction to Distributed systems: Goals of distributed system, hardware and software concepts, design issues. Communication in Distributed systems: Layered protocols, ATM networks, the Client - Server model, remote procedure call and group communication.

UNIT–II

Synchronization in Distributed systems: Clock synchronization, Mutual exclusion, E-tech algorithms, the Bully algorithm, a ring algorithm, atomic transactions,

UNIT-III

Deadlocks: deadlock in distributed systems, Distributed deadlock prevention, and distributed dead lock detection.

UNIT–IV

Processes: Processes and Processors in distributed systems: Threads, system models, Processor allocation, Scheduling in distributed system, Fault tolerance and real time distributed systems.

UNIT-V

Distributed file systems: Distributed file systems design, distributed file system implementation, trends in distributed file systems. Distributed shared memory : What is shared memory, consistency models, page based distributed shared memory, shared variable distributed shared memory, object based DSM.

UNIT-VI

Case study MACH: Introduction to MACH, process management in MACH, memory management in MACH, communication in MACH, UNIX emulation in MACH. Case study DCE : Introduction to DCE threads, RPC's, Time service, Directory service, security service, Distributed file system.

TEXT BOOKS:

1. Distributed Operating System - Andrew. S. Tanenbaum, PHI
2. Operating Systems' – Internal and Design Principles Stallings, Fifth Edition–2005, Pearson education/PHI

REFERENCE BOOKS:

1. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th

   Edition, John Wiley.

2. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI.

ONLINE REFERENCES:

1. http://www.cs.colostate.edu/~cs551dl/externalLinks.php
2. http://www.personal.kent.edu/~rmuhamma/OpSystems/os.html
3. https://www.sanfoundry.com/operating-system-questions-answers-distributed-operating-system/
4. https://link.springer.com/journal/446
5. https://www.ukessays.com/.../the-distributed-operating-system-info...
6. https://www.youtube.com/watch?v=sK9MC5GREXg

IV B.TECH. I – SEMESTER (Professional Elective-III)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
BUSINESS INTELLIGENCE							

COURSE OBJECTIVE:

- To provide students with comprehensive and in-depth knowledge of Business Intelligence (BI) principles and techniques by introducing the relationship between managerial and technological perspectives.

COURSE OUTCOMES:

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

CO 1: Interpret the concepts and components of Business Intelligence (BI).
CO 2: Relate the business strategies applied over different areas of business.
CO 3: Identify the requirements needed to design a Business Intelligence model.
CO 4: Analyse a behavioral model to assess the behavior of the customer.

SYLLABUS:

UNIT - I

Business Intelligence and Information Exploitation: Improving the Decision-Making Process, Why a Business Intelligence Program, Business Intelligence and Program Success, The Analytics Spectrum, Taming the Information Explosion.

The Value of Business Intelligence: Value Drivers and Information Use, Performance Metrics and Key Performance Indicators, Using Actionable Knowledge, Horizontal Use Cases for Business Intelligence, Vertical Use Cases for Business Intelligence.

UNIT - II

Planning for Success: Introduction, Organizational Preparedness for Business Intelligence and Analytics, Initial Steps in Starting a Business Intelligence Program, Bridging the Gaps between Information Technology and the Business Users, Knowing the Different Types of Business Intelligence Users, Business Intelligence Success Factors: A Deeper Dive, More on Building Your Team, Strategic Versus Tactical Planning.

UNIT - III

Developing Your Business Intelligence Roadmap: A Business Intelligence Strategy: Vision to Blueprint, The Business Intelligence Roadmap: Example Phasing, Planning the Business Intelligence Plan.

The Business Intelligence Environment: Aspects of Business Intelligence and Analytics Platform and Strategy, The Organizational Business Intelligence Framework, Services and System Evolution.

UNIT - IV

Business Processes and Information Flow: Analytical Information Needs and Information

Flows, Information Processing and Information flow, the Information Flow Model.

Data Requirements Analysis: Introduction, Business Uses of Information, Metrics: Facts,

Qualifiers, and Models, What is Data Requirements Analysis?

UNIT - V

Data Profiling: Establishing Usability of Candidate Data Sources, Data Profiling Activities, Attribute Analysis and Relationship Analysis.

UNIT - VI

Deriving Insight from Collections of Data: Introduction, Customer Profiles and Customer Behavior, Customer Lifetime Value Demographics, Psychographics, Geographic's, Geographic Data, Behavior Analysis.

TEXT BOOK:

D. Loshin, Business Intelligence: The savvy manager's guide,Morgan Kaufmann Publishers, 2003.

REFERENCE BOOKS:

1. M. Biere, Business intelligence for the enterprise, 2 ed.: IBM Press, 2003.
2. C. Howson, Successful Business Intelligence: Secrets to making Killer BI Applications, 1 ed.: McGraw-Hill 2007.

ONLINE REFERENCES:

1. https://www.youtube.com/watch?v=N8F7eOqgH8Q
2. https://www.learnbi.com/blog/business-intelligence-environment/

IV B.TECH. I – SEMESTER (Professional Elective-III)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
SOFTWARE TESTING METHODOLOGY							

COURSE OBJECTIVES:

- To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.

- To discuss various software testing issues and solutions in software unit test; integration, regression, and system testing

COURSE OUTCOMES:

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

CO 1: Outline the software testing terminology.

CO 2: Compare and contrast various behavioural testing methodologies.

CO 3: Summarize various dynamic testing techniques and validation activities.

CO 4: Interpret software testing and quality management.

CO 5: Analyze debugging techniques and testing tools.

SYLLABUS:

UNIT - I

Software Testing: Introduction, Evolution, Myths & Facts, Goals, Psychology, Definition, Model for testing, Effective Vs Exhaustive Software Testing, Software Failure Case Studies.

Software Testing Terminology and Methodology: Software Testing Terminology, Software Testing Life Cycle.

UNIT - II

Verification and Validation: Verification & Validation Activities, Verification, Verification of Requirements, High level and low level designs, How to verify and validate code.

Dynamic Testing I: Black Box testing techniques: Boundary Value Analysis, Equivalence class Testing, State Table based testing, Decision table based testing, Cause-Effect Graphing based testing, Error guessing

UNIT - III

Dynamic Testing II: White-Box Testing: need, Logic coverage criteria, Basis path testing, Graph matrices, Loop testing, data flow testing, mutation testing

Static Testing: inspections, Structured Walkthroughs, Technical reviews

UNIT - IV

Validation activities: Unit testing, Integration Testing,. Function testing, system testing, acceptance testing

UNIT - V

Efficient Test Suite Management: Test case design, why does a test suite grow, minimizing the test suite and its benefits, test suite prioritization, Types of test case prioritization, prioritization techniques, measuring the effectiveness of a prioritized test suite

Software Quality Management: Software Quality metrics, SQA models

UNIT - VI

Debugging: process, techniques, correcting bugs.

Automation and Testing Tools: need for automation, categorization of testing tools, selection of testing tools, Cost incurred, Guidelines for automated testing, overview of some commercial testing tools.

TEXT BOOKS:

1. Software Testing, Principles and Practices, Naresh Chauhan, Oxford
2. Foundations of Software testing, Aditya P Mathur, 2ed, Pearson
3. Software Testing- Yogesh Singh, CAMBRIDGE

REFERENCE BOOKS:

1. Software testing techniques - Baris Beizer, International Thomson computer press, second edition.
2. Software Testing, Principles, techniques and Tools, M G Limaye, TMH
3. Effective Methods for Software testing, Willian E Perry, 3ed, Wiley

ONLINE REFERENCES:

1. https://www.youtube.com/watch?v=IhA-EUEjyW0
2. https://www.youtube.com/watch?v=goaZTAzsLMk
3. https://freevideolectures.com/Course/3655/Software-Testing
4. https://www.youtube.com/watch?v=ASzlf-av4v4
5. http://srsstesting.com/

IV B.TECH. I – SEMESTER (Professional Elective-III)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3

HIGH SPEED NETWORKS

COURSE OBJECTIVES:

1. To facilitate the students on the basis of ATM and Frame relay concepts and explain the various types of LAN's and to know about their applications.
2. To introduce the concept of queuing analysis and the concepts behind traffic management and congestion control.
3. Enable the students to know techniques involved in congestion control in ATM.
4. To facilitate the students on the basis of ISA and explain the various types of Queuing discipline.

COURSE OUTCOMES:

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

CO 1: Outline the concepts of ATM, Frame relay and different technologies involved in High Speed Networking.

CO 2: Interpret the basic concepts of Queuing system and Self- Similar Traffic.

CO 3: Summarize the techniques involved to support real-time traffic and congestion control.

CO 4: Analyse Congestion Control Management in ATM Networks.

CO 5: Compare the performance of various protocols used in Internet Routing.

CO 6: Analyse integrated and differentiated services.

SYLLABUS:

UNIT - I

High Speed Networks:

Frame Relay: Packet Switching Networks, Frame Relay Networks.

Asynchronous transfer mode: ATM Protocol Architecture, ATM logical Connections, ATM Cell, ATM Service Categories, ATM Adaptation Layer (AAL).

High Speed LANs: Fibre Channel.

UNIT - II

Queuing Analysis:
Queuing Models, Single server queues, Multi server queues, Networks of queues,

Self- Similar Traffic:

Self- similarity, Self- similar Data Traffic, Examples of Self- similar Data Traffic, Performance implications of Self- similar Data Traffic, Modeling and Estimation of Self- similar Data Traffic.

UNIT - III

Congestion Control in Data Networks and Internets:

Effects of Congestion, Congestion and Control, Traffic Management, Congestion Control in Packet-Switching Networks, Frame Relay Congestion Control.

TCP Traffic Flow:

TCP Flow Control, TCP Congestion Control, Performance of TCP over ATM.

UNIT - IV

Traffic and Congestion Control in ATM Networks:

Requirements for ATM Traffic and Congestion control, ATM Traffic – Related Attributes, Traffic Management Frame work, ABR traffic Management, GFR traffic management.

UNIT - V

Internet Routing:

Interior Routing Protocols: Interior Routing Principles, Distance- Vector Protocol: RIP, Link-State Protocol: OSPF

Exterior Routing Protocols and Multicast: Path- Vector Protocols: BGP and IDRP, Multicasting.

UNIT - VI

Integrated and Differentiated Services:

Integrated Services Architecture (ISA), Queuing Discipline, Weighted Fair Queuing, Random Early Detection, Differentiated Services.

TEXT BOOK:

1. William Stallings, "High Speed Networks And Internet", Pearson Education, Second Edition, 2002.

REFERENCE BOOKS:

1. Warland & Pravin Varaiya, "HIGH PERFORMANCE COMMUNICATION NETWORKS", Jean Harcourt Asia Pvt. Ltd., II Edition, 2001.
2. Irvan Pepelnjk, Jim Guichard, Jeff Apcar, "MPLS and VPN architecture", Cisco Press, Volume 1 and 2, 2003
3. Abhijit S. Pandya, Ercan Sea, "ATM Technology for Broad Band Telecommunication Networks", CRC Press, New York, 2004.

ONLINE REFERENCES:

1. https://www.slideshare.net/ayyakathir/unit1-29753217
2. nptel.ac.in/courses/106105082/30
3. https://www.youtube.com/watch?v=oSQrL4x-YiM

IV B.TECH. I – SEMESTER (Professional Elective-IV)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3

HIGH PERFORMANCE COMPUTING

COURSE OBJECTIVES:

- To learn about approaches used in high performance computing.
- To learn about techniques and methods to scale up scientific applications.
- To design advanced modern computing systems.

COURSE OUTCOMES:

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

CO 1: Interpret the terminology of high performance computing.

CO 2: Make use of MPI based parallel programs in distributed Memory architectures.

CO 3: Analyze parallel programs using Pthreads and OpenMP.

CO 4: Summarize the concept of GP-GPU.

SYLLABUS:

UNIT - I

Introduction to Parallel hardware and software, need for high performance systems and Parallel Programming, SISD, SIMD, MISD, MIMD models, Performance issues.

UNIT - II

PThreads, Thread Creation, Passing arguments to Thread function, Simple matrix multiplication using Pthreads.

UNIT - III

Pthreads: Critical sections, mutexes, semaphores, barriers and conditional variables, locks, thread safety, simple programming assignments.

UNIT - IV

Open MP Programming: introduction, reduction clause, parallel for-loop scheduling, atomic directive, critical sections and locks, private directive, Programming assignments, n body solvers using openMP.

UNIT - V

Introduction to MPI programming: MPI primitives such as MPI_Send, MPI-Recv, MPI_Init, MPI-Finalize, etc., Application of MPI to Trepizoidal rule, Parallel Quick sorting algorithm

UNIT - VI

Introduction to GPU computing, Graphics pipelines, GPGPU, Data Parallelism and CUDA C Programming, CUDA Threads Organization, Simple Matrix multiplication using CUDA, CUDA memories.

TEXT BOOKS:

1. An Introduction to Parallel Programming, Peter S Pacheco, Elsevier, 2011
2. Programming Massively Parallel Processors, Kirk & Hwu, Elsevier, 2012

REFERENCE BOOKS:

1. CUDA by example: An introduction to General Purpose GPU Programming, Jason,Sanders, Edward Kandrit, Perason, 2011
2. CUDA Programming, Shame Cook, Elsevier
3. High Performance Heterogeneous Computing, Jack Dongarra, Alexey & Lastovetsky , Wiley
4. Parallel computing theory and practice, Michel J.Quinn, TMH

ONLINE REFERENCES:

1. https://in.udacity.com/course/high-performance-computing--ud281
2. https://www.edx.org/course/high-performance-computing-reproducible-harvardx-ph525-6x-1

IV B.TECH. I – SEMESTER (Professional Elective-IV)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
MACHINE LEARNING							

COURSE OBJECTIVES:

- To be Familiar with a set of well-known supervised, unsupervised and semi-supervised learning algorithms.
- To be able to implement some basic machine learning algorithms.
- To understand how machine learning algorithms are evaluated.

COURSE OUTCOMES:

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

CO 1: Identify the characteristics of machine learning that make it useful to real-world Problems.

CO 2: Compare and contrast supervised, semi-supervised, and unsupervised machine learning algorithms.

CO 3: Apply regularized regression algorithms.

CO 4: Summarize the concept of neural networks for learning non-linear functions.

CO 5: Analyze support vector machines, Instance based learning and genetic algorithms.

SYLLABUS:

UNIT - I

Introduction: Well-posed learning problems, Designing a learning system, Perspectives and issues in machine learning. Concept learning and the general to specific ordering – Introduction, A concept learning task, Concept learning as search, Find-S: finding a maximally specific hypothesis, Version spaces and the candidate elimination algorithm, Remarks on version spaces and candidate elimination, Inductive bias.

UNIT - II

Linear Regression & Logistic Regression
Predicting numeric values:
regression - Finding the best fit lines with linear regression, Locally weighted linear regression, Shrinking Coefficients, The bias / Variance tradeoff.
Logistic Regression: Classification with logistic regression and the sigmoid function, Using optimization to find the best regression coefficients.

UNIT - III
Artificial Neural Networks: Introduction, Neural network representation, Appropriate problems for neural network learning, Perceptions, Multilayer networks and the back propagation algorithm, Remarks on the back propagation algorithm, An illustrative example face recognition, Advanced topics in artificial neural networks

UNIT - IV

Evaluation Hypotheses: Motivation, Estimation hypothesis accuracy, Basics of sampling theory, A general approach for deriving confidence intervals, Difference in error of two hypotheses, Comparing learning algorithms.

UNIT - V

Support vector machines & Dimensionality Reduction techniques: Separating data with the maximum margin, finding the maximum margin, efficient optimization with SMO algorithm, speeding up optimization with full platt SMO, Using Kernels for more Complex data.

Dimensionality Reduction techniques: Principal Component analysis, Example.

UNIT - VI

Instance-Based Learning- Introduction, k -Nearest Neighbor Learning, Locally Weighted Regression, Radial Basis Functions, Case-Based Reasoning, Remarks on Lazy and Eager Learning.

Genetic Algorithms: Representing Hypotheses, Genetic Operators, Fitness Function and Selection, Illustrative Example.

TEXT BOOKS:

1. Machine Learning, Tom M. Mitchell, MGH
2. Machine Learning in Action, Peter Harington, 2012, Cengage.`

REFERENCE BOOK:

1. Introduction to Machine Learning, Ethem Alpaydin, PHI, 2004

ONLINE 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. http://nptel.ac.in/courses/106105152

IV B.TECH. I - SEMESTER (Professional Elective-IV)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
SOFTWARE PROCESS AND PROJECT MANAGEMENT							

COURSE OBJECTIVES:

- To see Software Process and Project Management as a key component of successful software projects.
- To produce software of high quality together with software techniques.

COURSE OUTCOMES:

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

CO 1: Interpret software process maturity framework.

CO 2: Outline conventional software management and software economics.

CO 3: Summarize the purpose and importance of process artifacts and Life cycle phases.

CO 4: Compare different activities, workflows of software project and project planning.

CO 5: Analyze project organization, control and process instrumentation.

CO 6: Analyze development and management of modern projects.

SYLLABUS:

UNIT - I

Software Process Maturity: Software maturity Framework**,** Principles of Software Process Change, Software Process Assessment, The Initial Process, The Repeatable Process, The Defined Process, The Managed Process, The Optimizing Process.

Process Reference Models Capability Maturity Model (CMM)**,** CMMI, PCMM, PSP, TSP.

UNIT - II

Software Project Management Renaissance Conventional Software Management, Evolution of Software Economics, Improving Software Economics, The old way and the new way.

UNIT - III

Life-Cycle Phases and Process artifacts Engineering and Production stages, inception phase, elaboration phase, construction phase, transition phase, artifact sets, management artifacts, engineering artifacts and pragmatic artifacts, model based software architectures.

UNIT - IV

Workflows and Checkpoints of process Software process workflows, Iteration workflows, Major milestones, Minor milestones, Periodic status assessments.

Process Planning Work breakdown structures, Planning guidelines, cost and schedule estimating process, iteration planning process, Pragmatic planning.

UNIT - V

Project Organizations Line-of- business organizations, project organizations, evolution of organizations, process automation.

Project Control and process instrumentation The seven core metrics, management indicators, quality indicators, life-cycle expectations, Pragmatic software metrics, metrics automation.

UNIT - VI

CCPDS-R Case Study and Future Software Project Management Practices Modern Project Profiles, Next-Generation software Economics, Modern Process Transitions.

TEXT BOOKS:

1. Managing the Software Process, Watts S. Humphrey, Pearson Education.
2. Software Project Management, Walker Royce, Pearson Education.

REFERENCE BOOKS:

1. Effective Project Management: Traditional, Agile, Extreme, Robert Wysocki, Sixth edition, Wiley India, rp2011.
2. An Introduction to the Team Software Process, Watts S. Humphrey, Pearson Education, 2000
3. Process Improvement essentials, James R. Persse, O'Reilly, 2006
4. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, TMH, 2006
5. Applied Software Project Management, Andrew Stellman & Jennifer Greene, O'Reilly, 2006.

ONLINE REFERENCES:

1. https://www.youtube.com/watch?v=SPcv4PUKGX8
2. https://www.youtube.com/watch?v=5pwc2DYlKQU
3. https://www.coursera.org/courses?languages=en&query=software+project+managemet
4. https://www.youtube.com/watch?v=BOU1YP5NZVA

IV B.TECH. I – SEMESTER (Professional Elective-IV)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
MOBILE AD HOC AND SENSOR NETWORKS							

COURSE OBJECTIVES:

- To make the student understand the concepts of MOBILE AD HOC NETWORKS (MANET) as well as Wireless Sensor Networks (WSN), their characteristics, novel applications, and technical challenges.
- To understand the issues and solutions of various layers of MANETs, namely MAC layer, Network Layer & Transport Layer in MANETs and WSN.
- To understand the platforms and protocols used in MANETs and WSN.
- To make the student take up further research as part of his higher studies

COURSE OUTCOMES:

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

CO 1: Analyse the routing protocols in MANET.

CO 2: Outline the data transmission in MANET.

CO 3: Interpret the TCP over Ad-hoc Networks.

CO 4: Interpret the data transmission and data acquisition in WSN.

CO 5: Outline the tools and network platforms of WSN.

SYLLABUS:

UNIT - I

Introduction to Ad Hoc Networks: Characteristics of MANETs, applications of MANETs, and challenges of MANETs.

Routing in Adhoc Networks: Introduction, Topology based versus Position based approaches, Topology based routing Protocols and Position based routing Protocols

UNIT - II

Data Transmission: The Broadcast storm, Multicasting and Geocasting

UNIT - III

TCP over Ad Hoc: TCP protocol overview, TCP and MANETs and Solutions for TCP over Ad hoc

UNIT - IV

Basics of Wireless Sensors and Applications: Sensing and Communication Range, Design Issues, Energy consumption, Clustering of Sensors, Applications of WSNs

UNIT - V

Data Retrieval in Sensor Networks: MAC layer, Routing layer, High-level application layer support

UNIT - VI

Sensor Network Platforms and Tools, Sensor Network Hardware, Sensor Network Programming Challenges, Node-Level Software Platforms.

TEXTBOOK:

1. Ad hoc and Sensor Networks - Theory and Applications, by Carlos Cordeiro and Dharma P. Agrawal, World Scientific Publications, March 2006, ISBN 981-256-681-3

REFERENCE BOOK:

1. Wireless Sensor Networks: An Information Processing Approach, Feng Zhao, Leonidas Guibas, Elsevier Science ISBN: 978-1-55860-914-3, (Morgan Kauffman)

ONLINE REFERENCES:

1. https://www.youtube.com/watch?v=LXSkpB35cjw
2. https://www.youtube.com/watch?v=oJcAijg87L0

IV B.TECH-I-SEMESTER (Professional Elective-IV)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
PROGRAMMING WITH RUBY							

COURSE OBJECTIVES:

- To gain the knowledge of Server side programming languages and techniques associated with the World Wide Web.
- To understand how to use Ruby on rails and GUI programming tools for creating dynamic web pages.

COURSE OUTCOMES:

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

CO 1: Interpret the features of Ruby Programming language.
CO 2: Make use of programing constructs in Ruby programing.
CO 3: Apply object-oriented concepts and I/O handling in Ruby applications.
CO 4: Apply regular expressions in validating data.
CO 5: Illustrate the concepts of RUBY TK.
CO 6: Analyze server-side Ruby scripts for publishing on the Web.

SYLLABUS:

UNIT - I

Introduction to Ruby, Environment Setup.

Strings, Numbers, Classes and Objects: Getting and Putting Input, Strings and Embedded Evaluation, Numbers, Comments, Testing a Condition: if..then, Local and Global Variables, Classes and Objects, Instance Variables, Retrieving Data from an Object, Messages, Methods, and Polymorphism, Constructors: new and initialize, Inspecting Objects.

Class Hierarchies, Attributes and Class Variables: Super classes and Subclasses, Passing Arguments to the Superclass, Accessor Methods, Attribute Readers and Writers, Calling Methods of a Superclass, Class Variables.

Strings and Ranges: User-Defined String Delimiters, Back quotes, String Handling, Concatenation, What About Commas? String Assignment, Indexing into a String, Removing Newline Characters: chop and chomp, Format Strings, Ranges, Ranges of Strings, Iterating with a Range.

UNIT - II

Arrays and Hashes: Arrays, Creating Arrays, Multidimensional Arrays, Iterating over Arrays, Indexing into Arrays, Copying Arrays, Testing Arrays for Equality, Sorting Arrays, Comparing Values, Array Methods, Hashes, Creating Hashes, Indexing into a Hash, Copying a Hash, Hash Order, Sorting a Hash, Hash Methods.

Loops and Iterators: for Loops, Blocks and Block Parameters, Iterating upto and downto, Multiple Iterator Arguments, while Loops, while Modifiers, Ensuring a while Loop executes at Least Once, until Loops, loop.

Conditional Statements: if..then..else, and, or, and not, Negation, if..elsif, unless, if and unless Modifiers, Case Statements, The === Method, Alternative Case Syntax

UNIT - III

Methods: Class Methods, What Are Class Methods For?, Class Variables, Ruby Constructors: new or initialize?, Singleton Methods, Singleton Classes, Overriding Methods,

Public, Protected and Private Methods.

Passing Arguments and Returning Values: Summarizing Instance, Class, and Singleton, Methods, Returning Values, Returning Multiple Values, Default and Multiple Arguments, Assignment and Parameter Passing, Integers Are Special, The One-Way-In, One-Way-Out Principle, Modifying Receivers and Yielding New Objects, Potential Side Effects of Reliance on Argument Values, Parallel Assignment.

Exception Handling: rescue: Execute Code When Error Occurs, ensure: Execute Code Whether or Not an Error Occurs, else: Execute Code When No Error Occurs, Error Numbers, retry: Attempt to Execute Code Again after an Error, raise: Reactivate a Handled Error.

UNIT - IV

Files and IO: Opening and Closing Files, Characters and Compatibility, Files andDirectories, Copying Files, Directory Inquiries, A Discursion into Recursion, Sorting by Size,

Regular Expressions: Making Matches, Match Groups, MatchData, Prematch and Postmatch, Greedy Matching, String Methods, File Operations.

UNIT - V

Ruby and the web: Writing CGI Scripts, Cookies, Improving Performance, Choice of Web Servers.

Ruby TK: Simple Tk Application, Widgets, Binding Events, Canvas, Scrolling, Translating from Perl/Tk Documentation.

UNIT - VI

Ruby on Rails: Installing Rails, Do It Yourself, Use an "All-in-One" Installer, Model-View-Controller, A First Ruby on Rails Application, Create a Rails Application, Create a Controller, Anatomy of a Simple Rails Application, The Generate Controller Script Summarized, Create a View, Rails Tags, Let's Make a Blog, Create the Database, Creating a MySQL Database, Scaffolding, Migration, Partials, Test It.

TEXT BOOKS:

1. The Book of Ruby- A Hands-On Guide for the Adventurous, HuwCollingbourne, 1st Edition, No Starch Press.

2. Programming Ruby- The Pragmatic Programmers' Guide, Dave Thomas with Chad Fowler and Andy Hunt, 2nd Edition O′Reilly.

REFERENCE BOOKS:

1. Ruby on Rails Bible - Timothy Fisher, Wiley Publishing Inc.
2. Ruby Best Practices-Gregory T.Brown, 1st Edition O'Reilly Media Inc.

ONLINE REFERENCES:

1. https://www.coursera.org/specializations/ruby-on-rails
2. https://www.edx.org/course/agile-development-using-ruby-rails-uc-berkeleyx-cs169-1x-1

IV B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	-	-	3	25	50	75	2
MOBLILE APPLICATION DEVELOPMET LAB							

COURSE OBJECTIVES:

- To enlighten the student with knowledge base in Android Applications Development.

COURSE OUTCOMES:

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

CO1 : Demonstrate various components of Android Framework.
CO2 : Develop user Interfaces for the Android Application.
CO3 : Develop Android Applications using Android API and Services.

LIST OF EXPERIMENTS

1. Create Hello World Android App using **Android Studio** and explain each step in detail.

2. Create an Activity that receive name form the user and displays **Hello Name** to the user using Android Studio.

3. Create an Activity that demonstrates the Life Cycle of an Activity.

4. Create an Android Application which receives URL form the user and open appropriate page in the system browser with the help of Implicit Intents using Android Studio.

5. Create an Android App which receives name form the user and displays welcome name in Second Activity.

6. Create Login Screen Application which shows Home screen if Login success otherwise displays error message using Android Studio.

7. Write an Android application program that demonstrate the use of
   a. RelativeLayout.
   b. LinearLayout.
   c. GridLayout.
   d. TableLayout.

8. Write an Android application program that demonstrates the use ImageView.

9. Write an Android application program that demonstrates the use of ListView and ArrayAdapter.

10. Write an Android application program that demonstrates how to create Custom ListView and Custom Adapters.

11. Write an Android application program that demonstrates the use of SQLite Database and Cursor.

12. Write an Android application program that demonstrates the use AsyncTask.

13. Write an Android application program that demonstrates Notifications.

14. Write an Android application program that demonstrates Shared Preferences.

15. Write an Android application program that connect to the internet, gets JSON data and displays the result in UI by parsing JSON data.

ONLINE REFERENCES:

1. https://developer.android.com/index.html
2. http://nptel.ac.in/courses/106106147/10
3. https://www.edx.org/course/introduction-mobile-application-hkustx-comp107x-2
4. https://www.coursera.org/specializations/android-app-development

IV B.TECH. I - SEMESTER (PROFESSIONAL SKILL BASED LAB)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	3	25	50	75	2
CCNA-I							

COURSE OBJECTIVES:

- To impart knowledge about Computer Networks, various protocols used in Communication, Managing and configuring Cisco Switches and Routers and various WAN technologies.

COURSE OUTCOMES:

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

CO 1: Build a small network for a small Organization.
CO 2: Implement switching and routing protocols in a network.
CO 3: Experiment with various troubleshooting techniques and scaling essentials of a network.
CO 4: Apply protocols to establish and troubleshoot wired and wireless networks.

SYLLABUS:

UNIT - I
Introduction to Networks: Exploring the Network, Configuring a Network Operating System, Network Protocols and Communications, Network Access, Ethernet, Network Layer, Transport Layer, IP Addressing, Subnetting IP Networks, Application Layer, Building a small network.

UNIT - II
Routing and Switching: Introduction to Switched Networks, Basic Switching Concepts and Configuration, Implementing VLAN Security, Routing Concepts, Inter-VLAN Routing, Static Routing, Routing Dynamically, Single-Area OSPF, Access Control Lists, DHCP, NTP, Network Address Translation for IPv4, Device Discovery with CDP, LLDP, Password Recovery

UNIT - III
Essentials Scaling Networks: Growing the Network, LAN Redundancy, Link Aggregation, Wireless, Adjust and Troubleshoot Single-Area OSPF, Multiarea OSPF, EIGRP, Adjust and Troubleshoot EIGRP, IOS File Management, DTP, VTP and HSRP.

UNIT - IV
Connecting Networks: Hierarchical Network Design, Connecting to the WAN, Point-to-Point Connections, Frame Relay, Network Address Translation for IPv4, Broadband Solutions, Securing Site-to-Site Connectivity, VPNs, PPPoE, Monitoring the Network, Troubleshoot the Network, BGP, SNMPv3, DHCP Snooping, AAA with RADIUS and TACACS+, 802.1X, SPAN, QoS, Cloud and Virtualization, Network Programming.

TEXT BOOKS:
1. CCNA Routing and Switching Complete Study Guide, by Todd Lammle, 2013.
2. Networking Basics CCNA 1 Companion Guide, Wendell Odom, Thomas Knott , 2006

ONLINE REFERENCES:
1. https://static-course-assets.s3.amazonaws.com/ITN6/en/index.html?r=https:// 473618154.netacad.com/courses/665581

IV B.TECH. I - SEMESTER (PROFESSIONAL SKILL BASED LAB)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	3	25	50	75	2

ORACLE DATABASE ADMINISTRATION

COURSE OBJECTIVES:

* Learn about the Oracle Database Architecture.
* Create and manage an Oracle Database Instance.
* Create and manage Storage Structures.
* Configure the Oracle Network Environment.
* Create and manage users.
* Monitor the database and manage performance.
* Learn basic information on backup and recovery techniques.
* To use the Oracle Support Workbench and My Oracle Support to update your Oracle Database software.

COURSE OUTCOMES:

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

CO 1: Create oracle database instance
CO 2: Manage and configure oracle network environment.
CO 3: Implement security features in database.
CO 4: Take and restore backup and recovery
CO 5: Perform database recovery.

SYLLABUS:

UNIT - I
Exploring the database architecture, preparing the database environment, creating oracle database, managing oracle instance

UNIT -II
Configuring the oracle network environment, managing database storage structures, managing data and concurrency

UNIT - III
Managing undo data, Implementing database security, Database maintenance, Performance management, intelligent infrastructure enhancements

UNIT - IV
Backup & Recovery concepts, performing database backups, performing database recovery

UNIT -V
Overview of database recovery advisor, use database recovery advisor to perform recovery (control file, redo log file and data files) Moving data

TEXT BOOKS:
1. Expert Oracle 10g/11g Administration – by Sam R Alapati (Apress publications)
2. Expert Oracle Database Architecture 9i and 10g programming techniques – by Thomas Kyte (apress publications)

IV B.TECH. I - SEMESTER (PROFESSIONAL SKILL BASED LAB)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	3	25	50	75	2

MICROSOFT SQL SERVER ADMINISTRATION

COURSE OBJECTIVES:

- Describe core database administration tasks and tools.
- Install and configure SQL Server.
- Configure SQL Server databases and storage.
- Plan and implement a backup strategy and restore databases from backups.
- Import and export data
- Monitor SQL Server.

COURSE OUTCOMES:

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

CO 1: Install and configure SQL Server.

CO 2: Demonstrate SQL server management and monitoring features.

CO 3: Create and maintain indexes.

CO 4: Take and restore backup and recovery in SQL server.

CO 5: Perform server integration services.

SYLLABUS:

UNIT -I
SQL server overview, Installing & configuring SQL Server.

UNIT - II
SQL server management studio & other tools, monitoring the database server

UNIT -III
Database & index maintenance, Securing SQL server

UNIT IV
SQL server backup & Recovery, Database availability ,Replicating information

UNIT - V
SQL server integration services, Monitoring & performance

TEXT BOOKS:
1. Introducing Microsoft SQL Server 2014 by Ross Mistry and Stacia Misner.
2. Microsoft SQL Server 2012 Internals by Kalen Delaney.
3. SQL Server 2008 Administration in Action by Rod Colledge.

IV B.TECH-I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	3	25	50	75	2
IOT LAB							

COURSE OBJECTIVES:

- To build a small low cost embedded system using Arduino / Raspberry Pi or equivalent boards.

- To apply the concept of Internet of Things in the real world scenario.

COURSE OUTCOMES:

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

CO1: Analyze the requirements, specifications to design home automation applications.

CO2: Build smart city applications using Arduino.

CO3: Develop agricultural applications using Raspberry pi.

CO4: Utilize AutoBahn, Xively Cloud communication API's to exchange data.

LIST OF EXPERIEMENTS

1.
    a. Indentify the parts of Arduino board.
    b. How to install Arduino board in different operating systems
    c. Blink the LED on and off with 500 ms time delay using Arduino UNO board.
2.
    a. Blink the LED on and off with 200 ms time delay using Arduino UNO board.
    b. Controlling AC light using Arduino UNO with Relay module.
3.
    a. Detecting obstacle with IR sensor and Arduino.
4.
    b. Setup the Dht 11 Humidity sensor on an Arduino.
5.
    a. Find the distance using ultrasonic sensor HC-SR04 and Arduino.
    b. Display the wave on processing IDE console using HC-SR04 sensor.

6. Blink the LED using LDR sensor.

7. Smoke detection using MQ-2 gas sensor.

8. Motion detection using PIR sensors.

9. Display the text using 16 X 2 LCD display module.

10. Controlling LED with Raspberry Pi 3.

IV B.TECH. I - SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	3	25	50	75	2

BIG DATA ANALYTICS LAB

COURSE OBJECTIVES:

- Introducing Java concepts required for developing map reduce programs.
- Optimize business decisions and create competitive advantage with Big Data analytics.
- Derive business benefit from unstructured data.
- Imparting the architectural concepts of Hadoop and introducing map reduce paradigm.
- To introduce programming tools PIG & HIVE in Hadoop echo system.

COURSE OUTCOMES:

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

CO1: Experiment with installation of Hadoop and develop applications using MapReduce framework.
CO2: Experiment with installation of Spark and develop applications**.**
CO3: Analyze Hadoop data with PIG.
CO4: Develop NoSQL structures like Hive for processing and aggregating logs in the database.

LIST OF EXPERIMENTS

1. (i) Perform setting up and Installing Hadoop in its three operating modes: Standalone, Pseudo

   distributed, and fully distributed mode.

   (ii)Use web based tools to monitor your Hadoop setup.

2. Implement the following file management tasks in Hadoop:

   - Adding files and directories

   - Retrieving files

   - Deleting files

   Hint: A typical Hadoop workflow creates data files (such as log files) elsewhere and copies them into HDFS using one of the above command line utilities.

3. Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm.

4. Write a Map Reduce program that mines weather data. Weather sensors collecting data every hour at many locations across the globe gather a large volume of log data, which is a good candidate for analysis with MapReduce, since it is semi structured and record-oriented.

5. (i) Perform setting up and Installing SPARK.

   (ii)Use web based tools to monitor your SPARK setup.

6. Run a basic Word Count Map Reduce program using SPARK.

7. Write a SPARK program that mines weather data. Weather sensors collecting data every hour at many locations across the globe gather a large volume of log data, which is a good candidate for analysis, since it is semi structured and record-oriented.

8. Install and Run Pig then write Pig Latin scripts to sort, group, join, project, and filter your data.

9. Install and Run Hive then use Hive to create, alter, and drop databases, tables, views, functions, and indexes

ONLINE REFERENCES:

1. http://hadoop.apache.org/
2. https://cwiki.apache.org/confluence/display/Hive/Home
3. http://pig.apache.org/docs/r0.7.0/tutorial.html

IV B.TECH. I – SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	0	0	0	0	0

MASSIVE OPEN ONLINE COURSES (MOOCs)

COURSE OBJECTIVES:

- The majority of MOOCs require that the learner be self-directed and proactive in the learning process. In addition to engaging in the course material, they provide learners with an opportunity to develop or expand their personal learning networks (PLN). Learner success is enhanced by learner actions before, during, and after the MOOC.

COURSE OUTCOMES:

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

CO1: Identify suitable course required for their carrier

CO2: Adapt effectively for changing conditions.

CO3: Develop and refine oral communication skills.

CO4: Take part in lifelong learning

EVALUATION OF MOOC's COURSE

Student has to complete an on-line course to fulfil the academic requirement of B.Tech course. The on-line Course should be offered by any reputed organization like NPTEL, COURSERA, edX, Udacity, SWAYAM etc., approved by Departmental Committee constituted by HOD. . Student has to submit the progress of the MOOC's course (such as assignment submission etc.,) to the departmental committee. The B.Tech degree shall be awarded only upon submission of MOOC's certificate. If a student fails to submit in that semester, he/she has to submit the certificate in the subsequent semesters for getting the degree awarded.

IV B.TECH II SEMESTER

IV B.Tech – II SEMESTER COURSE STRUCTURE

S. NO.	SUBJECT	Cat. Code	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
1	**Professional Elective – V:** 1. Service Oriented Architecture 2. Pattern Recognition 3. Software Quality Assurance & Testing 4. Next Generation Networks 5. Artificial Intelligence	PE	4	-	-	40	60	100	3
2	**Open Elective – III (See the List of Open Electives)**	OE	4	-	-	40	60	100	3
3	Practical Training / Internship	PW	-	-	-	40	60	100	3
4	Major Project	PW	-	-	-	60	140	200	10
	Total		8	-	-	180	320	**500**	**19**

IV B.TECH. II – SEMESTER (Professional Elective – V)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
	SERVICE ORIENTED ARCHITECTURE						

COURSE OBJECTIVES:

- Understand the concepts of Service Oriented Architecture along with the evolution of SOA
- Be aware of the key issues facing many organizations, especially dealing with integration among systems and providing architectural abstractions to them
- Integrate SOA technologies with Web Services paradigms.
- Know related technologies and implementation basics of SOA

COURSE OUTCOMES:

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

CO 1: Outline primary concepts of SOA

CO 2: Interpret the integration of SOA technological points with Web Services.

CO 3: Make use of SOA in development cycle of Web Services.

CO 4: Compare and contrast SOA architecture with other architectures.

CO 5: Analyze web service framework with respect to SOA.

CO 6: Identify advanced concepts of service composition, Orchestration and Choreography

SYLLABUS:

UNIT - I

Introducing SOA: Fundamental SOA, Characteristics of contemporary SOA, Misperception about SOA, Tangible benefits of SOA.

UNIT - II

The Evolution of SOA: An SOA timeline, Continuing evolution of SOA, Roots of SOA.

UNIT - III

Web Services and Primitive SOA: Web Services framework, Services (Web services: Definition, Architecture and standards), Service descriptions with WSDL, Messaging with SOAP, UDDI.

UNIT - IV

Web Services and Contemporary SOA (I: Activity Management and Composition): Message exchange patterns, Coordination, Atomic transactions, Business activities, Orchestration, Choreography.

UNIT - V

Web Services and Contemporary SOA (II: Advanced Messaging, Metadata, and Security): Addressing, Reliable messaging, Correlation, Polices

UNIT - VI

Web Services and Contemporary SOA (II: Advanced Messaging, Metadata, and Security): Metadata exchange, Security, Notification and eventing

TEXT BOOK:

1. Thomas Erl, "Service Oriented Architecture: Concepts, Technology, and Design", Pearson education.

REFERENCES BOOKS:

1. Mark D Hansen, "SOA using Java Web Services", Prentice Hall Publication.
2. Michael Rosen & et el., "Applied SOA", Wiley Publication.
3. Roshen, " SOA based Enterprise Integration", TMH Publication.
4. Muninder Singh & Michael Huhns, "Service Oriented Computing". Wiley Publication.
5. B. V. Kumar, Prakash Narayan & Tony Ng, "Implementing SOA Using Java EE"

ONLINE REFERENCES:

1. https://www.coursera.org/learn/service-oriented-architecture
2. https://www.youtube.com/watch?v=A3_QlYJRVvk
3. https://www.youtube.com/watch?v=PZfYM48Gnj8&list=PL_uaeekrhGzK2FapcTxvuuXOwC PSZvFn3

IV B.TECH. II – SEMESTER (Professional Elective – V)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3

PATTERN RECOGNITION

COURSE OBJECTIVES:

- To understand the fundamental pattern recognition and machine learning theories.
- To implement certain important pattern recognition techniques.
- To apply the pattern recognition theories to applications of interest.

COURSE OUTCOMES:

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

CO1: Outline different paradigms of pattern recognition and feature selection.

CO2: Interpret various classification algorithms.

CO3: Model various classification techniques.

CO4: Interpret the use of decision tree in pattern recognition.

CO5: Analyze support vector machines and fundamentals of neural network.

CO6: Analyze clustering techniques and applications.

SYLLABUS:

UNIT - I

Introduction to Pattern Recognition: Data Sets for Pattern Recognition, Different Paradigms for Pattern Recognition, Pattern Representation: Data Structures for Pattern Representation, Representation of Clusters, Proximity Measures, Size of Patterns, Abstractions of the Data Set, Feature, Feature Selection, Evaluation of Classifiers, Evaluation of Clustering

UNIT – II

Nearest Neighbour Based Classifiers: Nearest Neighbour Algorithm, Variants of the NN Algorithm, Use of the Nearest Neighbour Algorithm for Transaction Databases, Efficient Algorithms, Data Reduction, Prototype Selection.

UNIT – III

Bayes Classifier: Bayes Theorem, Minimum error rate classifier, Estimation of Probabilities, Comparison with the NNC, Naive Bayes Classifier, Bayesian Belief Network.

UNIT – IV

Hidden Markov Models: Markov Models for Classification, Hidden Markov Models, Classification Using HMMs, Classification of Test Patterns.

Decision Trees: Introduction, Decision Trees for Pattern Classification, Construction of Decision Trees, Splitting at the Nodes, Over fitting and Pruning, Example of Decision Tree Induction.

UNIT – V

Support Vector Machines: Introduction, Linear Discriminant Functions, Learning the Linear Discriminant Function, Neural Networks, SVM for Classification, Linearly Separable Case, Non-linearly Separable Case.

Combination of Classifiers: Introduction, Methods for Constructing Ensembles of Classifiers, Methods for Combining Classifiers, Evaluation of Classifiers, Evaluation of Clustering.

UNIT – VI

Clustering: Clustering and its Importance, Hierarchical Algorithms, Partitional Clustering, Clustering Large Data Sets.

An Application to Handwritten Digit Recognition: Description of the Digit Data, Pre-processing of Data, Classification Algorithms, Selection of Representative Patterns.

TEXT BOOKS:

1. Pattern Recognition an Introduction, V. Susheela Devi M. Narasimha Murty, University Press, 1st edition, 2011.

2. Pattern Recognition, Segrios Theodoridis,Konstantinos Koutroumbas, Fourth Edition, Elsevier, 2008.

REFERENCE BOOKS:

1. Pattern Recognition and Image Analysis, Earl Gose, Richard John Baugh, Steve Jost, PHI 2004.

2. C. M. Bishop, 'Neural Networks for Pattern Recognition', Oxford University Press, Indian Edition, 2003.

3. Pattern Classification, R.O.Duda, P.E.Hart and D.G.Stork, Johy Wiley, Second Edition, 2002.

ONLINE REFERENCES:

1. https://www.youtube.com/watch?v=ZGUlaomeJ-k
2. https://link.springer.com/journal/11493
3. https://www.sciencedirect.com/journal/pattern-recognition
4. https://www.journals.elsevier.com/pattern-recognition/
5. https://www.coursera.org/learn/machine-learning/.../classification
6. https://www.youtube.com/watch?v=UzxYlbK2c7E

IV B.TECH. II – SEMESTER (Professional Elective-V)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3

SOFTWARE QUALITY ASSURANCE AND TESTING

COURSE OBJECTIVES:

- To develop methods and procedures for software development that can scale up for large systems and that can be used to consistently produce high-quality software at low cost and with a small cycle time.

COURSE OUTCOMES:

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

CO 1: Outline different aspects of software quality assurance and standards.

CO 2: Apply various software testing strategies.

CO 3: Develop test plans, schedules and testing techniques for software project.

CO 4: Apply features of software testing automation tools.

CO 5: Summarize different steps in software testing process.

CO 6: Identify the status of testing results and testing methodologies.

SYLLABUS:

UNIT - I

Software Quality Assurance and Standards

The Software Quality challenge, What is Software Quality, Software Quality factors, The components of Software Quality Assurance system, Software Quality Metrics, Costs of Software Quality, Quality Management Standards, Management and its role in Software Quality Assurance, SQA unit and other actors in SQA system.

Quality Standards: ISO 9000 and Companion ISO Standards, CMM, CMMI, PCMM, Malcom Balridge, 3 Sigma, 6 Sigma and other latest quality standards

UNIT - II

Software Testing Strategy and Environment: Minimizing Risks, Writing a Policy for Software Testing, Economics of Testing, Testing-an organizational issue, Management Support for Software Testing, Building a Structured Approach to Software Testing, Developing a Test Strategy

UNIT - III

Building Software Testing Process: Software Testing Guidelines, workbench concept, Customizing the Software Testing Process, Process Preparation checklist

Software Testing Techniques: Dynamic Testing – Black Box testing techniques, White Box testing techniques, Static testing, Validation Activities, Regression testing

UNIT - IV

Software Testing Tools: Selecting and Installing Software Testing Automation and Testing Tools. Load Runner, Win runner and Rational Testing Tools, Silk test, Java Testing Tools, JMetra, JUNIT and Cactus.

UNIT - V

Testing Process

Seven Step Testing Process – I: Overview of the Software Testing Process, Organizing of Testing, Developing the Test Plan, Verification Testing, Validation Testing.

UNIT - VI

Seven Step Testing Process – II: Analyzing and Reporting Test results, Acceptance and Operational Testing, Post-Implementation Analysis

Specialized Testing Responsibilities: Software Development Methodologies, Testing Client/Server Systems

TEXT BOOKS:

1. Effective Methods for Software Testing, Third edition, William E. Perry, Wiley India, 2009
2. Software Testing – Principles and Practices, Naresh Chauhan, Oxford University Press, 2010.
3. Software Quality Assurance – From Theory to Implementation, Daniel Galin, Pearson Education, 2009.

REFERENCE BOOKS:

1. Testing Computer Software, Cem Kaner, Jack Falk, Hung Quoc Nguyen, Wiley India, rp2012.

2. Software Testing – Principles, Techniques and Tools, M.G.Limaye, Tata McGraw-Hill, 2009.

3. Software Testing - A Craftsman's approach, Paul C. Jorgensen, Third edition, Auerbach Publications, 2010.

4. Foundations of Software Testing, Aditya P. Mathur, Pearson Education, 2008.

5. Software Testing and Quality Assurance – Theory and Practice, Kshirasagar Naik, Priyadashi Tripathy, Wiley India, 2010.

ONLINE REFERENCES:

1. https://www.youtube.com/watch?v=kpT95Jb3t3U
2. https://www.youtube.com/watch?v=T_CkZ1Ej0oY
3. https://www.youtube.com/watch?v=qNg7nzhfYhc
4. https://www.guru99.com/software-testing.html
5. https://freevideolectures.com/course/3655/software-testing

IV B.TECH-II-SEMESTER (Professional Elective – V)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
NEXT GENERATION NETWORKS							

COURSE OBJECTIVES:

- To learn next generation networks opportunities and challenges.
- To learn next generation networks technologies.

COURSE OUTCOMES:

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

CO 1: Identify the opportunities and challenges of Next Generation Networks.

CO 2: Outline the development areas of Next Generation Networks.

CO 3: Outline the IMS architecture.

CO 4: Compare various Technologies and Applications of NGN.

CO 5: Interpret the Network Management and Provisioning.

SYLLABUS:

UNIT - I

INTRODUCTION: Evolution of public mobile services - motivations for IP based services, Wireless IP network architecture – 3GPP packet data network architecture. Introduction to next generation networks - Changes, Opportunities and Challenges, Technologies, Networks, and Services, Next Generation Society, future Trends.

UNIT - II

NGN DEVELOPMENT AREAS: Terminal Area – Access Network Area – Backhaul Network Area – Core Transport Network Area – Service Creation Area – Network Control and Managerial Area – Service Control and Management – Advanced Technologies for Network and Service Management.

UNIT - III

IMS AND CONVERGENT MANAGEMENT: IMS Architecture - IMS services, QoS Control and Authentication, Network and Service management for NGN, IMS advantages, Next Generation OSS Architecture – standards important to OSS architecture, Information framework, OSS interaction with IMS, NGN OSS function/ information view reference model, DMTF CIM.

UNIT – IV

MPLS AND VPN: Technology overview –MPLS & QoS, MPLS services and components – layer 2 VPN, layer 2 internetworking, VPN services, signaling, layer 3 VPN –Technology overview, Remote Access and IPsec integration with MPLS VPN.

UNIT – V

MULTICAST: MPLS Multicast VPN overview – Applications, examples, IPv6 and MPLS – Technology overview, Future of MPLS –Integrating IP and optical networks, Future layer 3 services, future layer 2 services.

UNIT – VI

NGN MANAGEMENT: Network Management and Provisioning – Configuration, Accounting, performance, security, case study for MPLS, Future enhancements – Adaptive self-healing networks

TEXT BOOK:

1. Thomas Plavyk, "Next generation Telecommunication Networks, Services and Management", Wiley & IEEE Press Publications, 2012.

REFERENCE BOOKS:

1. Neill Wilkinson, "Next Generation Network Services", John Wiley Publications, 2002.
2. Monique J. Morrow, "Next Generation Networks", CISCO Press, 2007.
3. Robert Wood, "MPLS and Next Generation Networks: Foundations for NGN and Enterprise Virtualization", CISCO Press, 2006.
4. Ina Minie, Julian Lucek, "MPLS enabled Applications – Emerging developments and new technologies", 3rd edition, Wiley. 2011.
5. Jingming Li Salina and Pascal Salina, Next Generation Networks, Prospective and Potentials, John Wiley and Sons, 2007.
6. Eldad Perahia and Robert Stacey, Next Generation Wireless LANs, Cambridge University Press, 2008.

ONLINE REFERENCES:

1. https://www.packetdesign.com/blog/a-guide-to-mpls-vpn-fundamentals/
2. https://www.cisco.com/c/en/us/products/ios-nx-os-software/multiprotocol-label-switching-mpls/index.html
3. https://www.youtube.com/watch?v=t2WpMsk18yU

IV B.TECH-II-SEMESTER (Professional Elective – V)	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	4	0	0	40	60	100	3
ARTIFICIAL INTELLIGENCE							

COURSE OBJECTIVE:

- The main purpose of this course is to provide the most fundamental knowledge to the students so that they can understand what the AI is.
- Due to limited time, we will try to eliminate theoretic proofs and formal notations as far as possible, so that the students can get the full picture of AI easily.
- Students who become interested in AI may go on to the graduate school for further study.

COURSE OUTCOMES:

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

CO 1: Outline the fundamentals of artificial intelligence and characteristics of problems.
CO 2: Analyze different search techniques and predicate logic in artificial Intelligence.
CO 3: Interpret knowledge representation and symbolic reasoning using different rules.
CO 4: Interpret Statistical reasoning and filler structures.
CO 5: Apply various problem planning systems and different learning methodologies.
CO 6: Apply different language processing schemes while solving the real world problems.

SYLLABUS:

UNIT - I

What is Artificial Intelligence? What is AI Technique?, Defining the problem as a State space search, production systems, Problem characteristics, Production System characteristics.

UNIT - II

Heuristic Search Techniques- Generate & Test, Hill Climbing, Best First search, Problem reduction, Constraint satisfaction, Means Ends Analysis.

Predicate Logic– Representing Simple Facts in Logic, Representing Instances and Isa relationships, Computable functions and Predicates, Resolution, Natural deduction.

UNIT - III

Representing Knowledge Using Rules- Procedural vs Declarative knowledge, Logic Programming, Forward vs Backward Reasoning, Matching and Control Knowledge.

Symbolic reasoning under uncertainty– Introduction to non-monotonic Reasoning, Logics for non-monotonic reasoning, Implementation Issues, Implementation: Depth First Search, Breadth First Search.

UNIT - IV

Statistical Reasoning- Probability and Bayes' Theorem, Certainty Factors and Rule-based Systems, Bayesian Networks, Dempster-Shafer Theorem.

Weak and Strong Slot Filler Structures- Semantic nets, Frames, Conceptual dependency, Scripts.

UNIT - V

Planning- The Block world example, Components of a Planning System, Goal Stack Planning, Non Linear Planning using Constraint Posting, Hierarchical Planning.

Learning- Role of learning, Learning by taking advice, Learning in problem solving, Learning from examples: induction, Explanation-based learning, Discovery, Analogy.

UNIT - VI

Natural Language Processing- Syntactic processing, Semantic analysis, Discourse and pragmatic processing.

TEXT BOOKS:

1. Artificial Intelligence by Elaine Rich & Kevin Knight, Second edition, Tata Mcgraw hill.
2. Introduction to Artificial Intelligence and Expert Systems by Dan W. Paterson, PHI.

REFERENCE BOOKS:

1. Artificial Intelligence – A modern Approach by Stuart Russell and Peter Norvig, Second edition, Pearson.
2. Artificial Intelligence by Saroj Kaushik, Cengage Learning.

ONLINE REFERENCES:

1. https://www.lynda.com/Data.../Artificial-Intelligence.../601798-2.htm.
2. https://freevideolectures.com/Course/2272/Artificial-Intelligence
3. https://www.technologyreview.com/.../you-could-become-an-ai-mast...
4. https://www.edx.org/course/artificial-intelligence-ai-columbiax-csmm-101x-0
5. https://www.lynda.com/Data-Science-tutorials/Artificial-Intelligence-Foundations-Thinking-Machines/601798-2.html
6. https://www.journals.elsevier.com/artificial-intelligence/
7. https://www.technologyreview.com/s/600819/the-missing-link-of-artificial-intelligence/

IV B.TECH-II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	0	40	60	100	3
PRACTICAL TRAINING / INTERNSHIP							

COURSE OBJECTIVES:

- To provide the student with an opportunity to explore career interests while applying knowledge and skills learned in the classroom in a work setting.
- To gain a clearer sense of what they still need to learn and provides an opportunity to build professional networks.

COURSE OUTCOMES:

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

CO1: Gain practical experience within the business environment.

CO2: Acquire knowledge of the industry in which the internship is done.

CO3: Apply knowledge and skills learned in the classroom in a work setting.

CO4: Develop and refine oral and written communication skills.

CO5: Identify areas for future knowledge and skill development

Students are advised to take up Industrial Internship. In case, the student is unable to obtain the internship, they can opt for Practical Training.

Assessment for Internship:

Industrial Internship which is a part of the curriculum shall carry 100 marks. The time duration for internship shall be of 2 to 4 weeks during the inter semester break. After the completion of internship the student shall submit a certificate and a report to the concerned Departemental Committee constituted by the HOD for Evaluation and to conduct a Viva-Voce Examination. Out of 100 marks 40 marks shall be awarded for submission of certificate and report and 60 marks for presentation and Viva-Voce examination.

Assessment for Practical Training:

The practical training gained by student shall be assessed for 100 marks. The time duration for Practical Training shall be 2 to 4 weeks during the inter semester break. The training shall be evaluated through continuous assessment. After the completion of Practical Training the student shall submit a report to the Departmental Committee constituted by HOD for evaluation and to conduct a Viva-Voce Examination. Out of 100 marks 40 marks shall be awarded for day to day performance and submission of report and 60 marks for presentation and Viva-Voce examination.

IV B.TECH-II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	0	0	0	80	120	200	10

MAJOR PROJECT

COURSE OBJECTIVES:

- To offer students a glimpse into real world problems and challenges that need IT based solutions.
- To enable students to create very precise specifications of the IT solution to be designed.
- To enable students to use concepts of IT in creating a solution for a problem
- To improve the team building, communication and management skills of the students.

COURSE OUTCOMES:

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

CO1: Acquire practical knowledge within the chosen area of technology for project development.

CO2: Identify, analyze, formulate and handle programming projects with a comprehensive and systematic approach.

CO3: Contribute as an individual or in a team in development of technical projects.

CO4: Develop effective communication skills for presentation of project related activities.

1. BATCH FORMATION:

The same batch of Mini Project – II will continue for the Main Project also. If any student wants to change the batch he/she can request project review committee (PRC). If possible project review committee can take required action.

2. GUIDE ALLOTMENT:

If any guide who was allotted for Mini Project-II is not available, the batch can select a new guide with the consent of HOD.

3. I MID SEMINAR:

Generally I Mid seminar is conducted after completing the literature survey. For this I Mid seminar the evaluation committee consists of guide, coordinator and HOD .This seminar is conducted for 40 marks. Out of 40 marks ,20 marks are awarded by guide based on the performance ,work and attendance of the student and 20 marks are awarded by the coordinator based on presentation ,work quality, analysis etc. during this seminar the students are supposed to deliver the proposed work and work completed so far.

4. II MID SEMINAR:

Like I Mid seminar, for II Mid seminar the evaluation committee consists of guide, coordinator & HOD. This seminar is conducted for 40 marks. Out of 40 marks, 20 marks are awarded by guide based on the performance, work and attendance of the student. The remaining 20 marks are

awarded by the coordinator based on presentation, work quality and result discussions. In this seminar the students are supposed to deliver the complete project work with final results.

5. EXTERNAL SEMINAR & VIVA VOCE:

For external viva the evaluation committee consists of university nominated external examiner, guide & HOD. This viva is conducted for 120 marks.