

DEPARTMENT OF CIVIL ENGINEERING

OPEN ELECTIVE/JOB ORIENTED COURSE-I										
S.NO	CODE	SUBJECT	CAT. CODE	INTERNAL	EXTERNAL	TOTAL MARKS	L	T	P	CREDITS
1	R20CC1OE01	Disaster Management	OE	30	70	100	4	0	0	4
2	R20CC0E02	Green Technology	OE	30	70	100	4	0	0	4
OPEN ELECTIVE/JOB ORIENTED COURSE-II										
3	R20CC2OE01	Remote Sensing And Gis	OE	30	70	100	4	0	0	4
4	R20CC2OE02	Traffic Safety	OE	30	70	100	4	0	0	4
OPEN ELECTIVE/JOB ORIENTED COURSE-III										
5	R20CC3OE01	Railway, Airport & Harbor Engineering	OE	30	70	100	4	0	0	4
6	R20CC3OE02	Low Cost Housing	OE	30	70	100	4	0	0	4
OPEN ELECTIVE/JOB ORIENTED COURSE-IV										
7	R20CC4OE01	Environmental Pollution & Control	OE	30	70	100	4	0	0	4
8	R20CC4OE02	Construction Technology And Management	OE	30	70	100	4	0	0	4

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III B.TECH I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
CODE: R20CC1OE01	3	0	0	30	70	100	3
DISASTER MANAGEMENT							

COURSE OBJECTIVES:

The subject provides different disasters, tools and methods for disaster management

COURSE OUTCOMES:

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

CO 1: Understanding Disasters, man-made Hazards and Vulnerabilities

CO 2: Understanding disaster management mechanism

CO 3: Understanding capacity building concepts

CO 4: Understanding coping Strategies

CO 5: Understanding planning of disaster managements

UNIT – I Understanding Disaster: Concept of Disaster - Different approaches- Concept of Risk - Levels of Disasters - Disaster Phenomena and Events (Global, national and regional) Hazards and Vulnerabilities: Natural and man-made hazards; response time, frequency and forewarning levels of different hazards - Characteristics and damage potential or natural hazards; hazard assessment - Dimensions of vulnerability factors; vulnerability assessment - Vulnerability and disaster risk - Vulnerabilities to flood and earthquake hazards

UNIT – II Disaster Management Mechanism: Concepts of risk management and crisis managements - Disaster Management Cycle - Response and Recovery - Development, Prevention, Mitigation and Preparedness - Planning for Relief

UNIT – III Capacity Building: Capacity Building: Concept - Structural and Nonstructural Measures Capacity Assessment; Strengthening Capacity for Reducing Risk - Counter-Disaster Resources and their utility in Disaster Management - Legislative Support at the state and national levels

UNIT – IV Coping with Disaster: Coping Strategies; alternative adjustment processes - Changing Concepts of disaster management - Industrial Safety Plan; Safety norms and survival kits - Mass media and disaster management

UNIT – V Planning for disaster management: Strategies for disaster management planning - Steps for formulating a disaster risk reduction plan - Disaster management Act and Policy in India - Organizational structure for disaster management in India - Preparation of state and district disaster

management plans

TEXT BOOKS:

1. Manual on Disaster Management, National Disaster Management, Agency Govt of India.
2. Disaster Management by Mrinalini Pandey Wiley 2014.
3. Disaster Science and Management by T. Bhattacharya, McGraw Hill Education (India) Pvt Ltd Wiley 2015

REFERENCE BOOKS:

1. Earth and Atmospheric Disasters Management, N. Pandharinath, CK Rajan, BS Publications 2009.
National Disaster Management Plan, Ministry of Home affairs, Government of India
<http://www.ndma.gov.in/images/policyplan/dmplan/draftndmp.pdf>

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III B.TECH I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
CODE: R20CC0E02	3	0	0	30	70	100	3
GREEN TECHNOLOGY							

COURSE OBJECTIVES:

Objective of this course is:

- To present different concepts of green technologies.
- To acquire principles of Energy efficient technologies.
- To impart knowledge on the methods of reducing CO₂ levels in atmosphere.
- To gain knowledge of the importance of life cycle assessment
- To learn the importance of green fuels and its impact on environment.

COURSE OUTCOMES

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

CO 1: Enlist different concepts of green technologies in a project

CO 2: Understand the principles of Energy efficient technologies

CO 3: Estimate the carbon credits of various activities

CO 4: Identify the importance of life cycle assessment

CO 5: Recognize the benefits of green fuels with respect to sustainable development.

SYLLABUS:

UNIT- I

Introduction: Green Technology – definition- Importance – Historical evolution – advantages and disadvantages of green technologies-factors affecting green technologies- Role of Industry, Government and Institutions – Industrial Ecology – role of industrial ecology in green echnology. Cleaner Production (CP): Definition – Importance – Historical evolution - Principles of Cleaner Production–Benefits–Promotion Barriers – Role of Industry,

UNIT- II

Cleaner Production Project Development and Implementation:

Government and Institutions – clean development mechanism, reuse, recovery, recycle, raw material substitution-Wealth from waste, case studies.

Overview of CP Assessment Steps and Skills, Process Flow Diagram, Material Balance, CP

Option Generation – Technical and Environmental Feasibility analysis – Economic valuation of alternatives - Total Cost Analysis – CP Financing – Preparing a Program Plan – Measuring Progress- ISO 14000.

UNIT- III

Pollution Prevention and Cleaner Production Awareness Plan – Waste audit – Environmental Statement, carbon credit, carbon sequestration, carbon trading, Life Cycle Assessment - Elements of LCA – Life Cycle Costing – Eco Labelling.

UNIT -IV

Availability and need of conventional energy resources, major environmental problems related to the conventional energy resources, future possibilities of energy need and availability. Non-conventional energy sources: Solar Energy-solar energy conversion technologies and devices, their principles, working and application.

UNIT- V

Green Fuels – Definition-benefits and challenges – comparison of green fuels with conventional fossil fuels with reference to environmental, economic and social impacts- public policies and market-driven initiatives.

Biomass energy: Concept of biomass energy utilization, types of biomass energy, conversion processes, Wind Energy, energy conversion technologies, their principles, equipment and suitability in Indian context; tidal and geothermal energy.

TEXT BOOKS:

1. 'Pollution Prevention: Fundamentals and Practice' by Paul L Bishop (2000), McGraw Hill International.
2. 'Cleaner Production Audit' by Prasad Modak, C.Visvanathan and Mandar Parasnis (1995), Environmental System Reviews, No.38, Asian Institute of Technology, Bangkok
3. 'Non-conventional Energy Sources' by Rai G.D.

REFERENCE BOOKS:

1. 'Pollution Prevention and Abatement Handbook – Towards Cleaner Production' by World Bank Group (1998), World Bank and UNEP, Washington D.C.
2. 'Handbook of Organic Waste Conversion' by Bewik M.W.M.
3. 'Solar Energy' The Solar Hydrogen Alternative' by Bokris J.O.

4. 'Solar Energy' by Sukhatme S.P.
5. 'Waste Energy Utilization Technology' by Kiang Y. H.

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III B.TECH II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
CODE: R20CC2OE01	2	0	2	30	70	100	3
REMOTE SENSING AND GIS							

COURSE OBJECTIVES:

The course is designed to

- Introduce the basic principles of Remote Sensing and GIS techniques.
- learn various types of sensors and platforms
- learn concepts of visual and digital image analyses
- understand the principles of spatial analysis
- appreciate application of RS and GIS to Civil Engineering

COURSE OUTCOMES

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

CO 1: Be familiar with ground, air and satellite based sensor platforms.

CO 2: interpret the aerial photographs and satellite imageries

CO 3: create and input spatial data for GIS application

CO 4: apply RS and GIS concepts in general

CO 5: apply RS and GIS concepts in hydrology

UNIT – I

Introduction to Remote sensing: Basic concepts of remote sensing, electromagnetic radiation, electromagnetic spectrum, interaction with atmosphere, energy interaction with the earth surfaces, characteristics of remote sensing systems, types of resolutions - advantages & limitations

Sensors and platforms: Introduction, types of sensors, airborne remote sensing, space borne remote sensing, image data characteristics, digital image data formats-band interleaved by pixel, band interleaved by line, band sequential, IRS, LANDSAT, SPOT & Recent satellite.

UNIT – II

Image analysis: Introduction, elements of visual interpretations, digital image processing- image pre- processing, image enhancement, image classification, supervised classification, unsupervised classification. : Overlay function-vector overlay operations; raster overlay operations, network analysis.

UNIT – III

Geographic Information System: Basic Principles, components, application areas of GIS, map projections.

Data entry and preparation: spatial data structures, raster and vector data formats, data inputs, data manipulation, data retrieval, data analysis and data display.

UNIT – IV

RS and GIS applications General: Land cover and land use, agriculture, forestry, geology, geomorphology, urban & transportation applications,

UNIT - V

Application to Hydrology and Water Resources: Flood zoning and mapping, groundwater prospects, groundwater quality monitoring and potential recharge zones, watershed management.

TEXT BOOKS:

1. Bhatta B (2008), 'Remote sensing and GIS', Oxford University Press
2. Lillesand, T.M, R.W. Kiefer and J.W. Chipman (2013) 'Remote Sensing and Image Interpretation', Wiley India Pvt. Ltd., New Delhi
3. Schowenger, R. A (2006) 'Remote Sensing' Elsevier publishers.
4. 'Fundamentals of Remote Sensing' by George Joseph, Universities Press, 2013.
5. 'Fundamentals of Geographic Information Systems' by Demers, M.N, Wiley India Pvt. Ltd, 2013.

REFERENCE BOOKS:

1. 'Remote Sensing and its Applications' by Narayan LRA, Universities Press, 2012.
2. 'Concepts and Techniques of Geographical Information System' by Chor Pang Lo and A K W Yeung, Prentice Hall (India), 2006

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III B.TECH II-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
CODE: R20CC20E02	2	0	2	30	70	100	3
TRAFFIC SAFETY							

COURSE OBJECTIVES:

- This module on the fundamentals of traffic engg. & some of the statistical methods to analyse the traffic safety.
- The accident interrogations and risk involved with measures to identify the causes are dealt.
- The role of road safety in planning the urban infrastructures design is discussed.
- Various mitigation measures to prevent the road accidents are dealt.

COURSE OUTCOMES:

The student is able to

CO 1: To understand fundamentals of Traffic Engg.

CO 2: To investigate and determine the collective factors & remedies of accident involved.

CO 3: To design and plan various road geometrics.

CO 4: To manage the traffic system from road safety point of view.

UNIT I

Fundamentals of Traffic Engineering:

Basic Characteristics of Motor-Vehicle Traffic, Highway Capacity, Applications of Traffic Control Devices, Traffic Design of Parking Facilities, Traffic Engineering Studies; Statistical Methods in Traffic Safety Analysis – Regression Methods, Poisson Distribution, Chi- Squared Distribution, Statistical Comparisons.

UNIT II

Accident Investigations and Risk Management:

Collection and Analysis of Accident Data, Condition and Collision Diagram, Causes and Remedies, Traffic Management Measures and Their Influence on Accident Prevention, Assessment of Road Safety, Methods to Identify and Prioritize Hazardous Locations and Elements, Determine Possible Causes of Crashes, Crash Reduction Capabilities and Countermeasures, Effectiveness of Safety Design Features, Accident Reconstruction.

UNIT III

Road Safety in Planning and Geometric Design:

Vehicle And Human Characteristics, Road Design and Road Equipments, Redesigning Junctions, Cross Section Improvements, Reconstruction and Rehabilitation of Roads, Road Maintenance, Traffic Control, Vehicle Design and Protective Devices, Post Accident Care.

UNIT IV

Role of Urban infrastructure design in safety:

Geometric Design of Roads; Design of Horizontal and Vertical Elements, Junctions, At Grade and Grade Separated Intersections, Road Safety in Urban Transport, Sustainable Modes and their safety.

UNIT V

Mitigation Measures:

Accident prevention by better planning, Accident prevention by better design of roads, Crash Countermeasures, Highway operation and accident control measures, Highway Safety Measures during construction, Highway geometry and safety; Safety in urban areas; Public transport and safety; Road safety policy making, Stakeholders involvement; Road safety law, Road safety audit.

TEXT BOOKS:

1. Institute of Transportation Engineers (ITE), The Traffic Safety Toolbox: A Primer on Traffic Safety, ITE, 1999.
2. Towards Safe Roads in Developing country, TRL – ODA, 2004.
3. Traffic Engineering and Transportation Planning – L.R. Kadiyali, Khanna Publishers
4. Fundamentals of Traffic Engineering, Richardo G Sigua

REFERENCE BOOKS:

1. Athelstan Popkess, Traffic Control and Road Accident Prevention, Chapman and Hall, 1997 (Digitized 2008)
2. Handbook of Road Safety measures, second Edition, Rune Elvik, Alena Hoye, TrulsVaa, Michael Sorenson
3. Ezra Hauer, Observational Before-After Studies in Road Safety, Pergamon Press, 1997 (reprinted 2002).

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4. Geetam Tiwari and Dinesh Mohan, Transport Planning and Traffic Safety: Making Cities, Roads, and Vehicles Safer, CRC Press, 2016
5. Fundamentals of Transportation Engineering – C.S. Papacostas, Prentice Hall India.
6. Transportation Engineering – An Introduction, C.Jotinkhisty, B. Kent Lall
7. Handbook of Road Safety measures, second Edition, Rune Elvik, Alena Hoye, Truls Vaa, Michael Sorenson

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IV B.TECH I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
CODE: R20CC30E01	2	0	2	30	70	100	3
RAILWAY, AIRPORT & HARBOR ENGINEERING							

COURSE OBJECTIVES:

- To understand the role of railways in transportation.
- To understand various parts of a railway track. And Introduction to geometric design of a railway section.
- To emphasize on various requirements of stations
- Present the concept airport planning, various obstruction runway and structural design of airport pavement.
- Emphasize on various facilities of a harbor and port and various controlling devices of a harbour.

COURSE OUTCOMES:

After successful completion of the course, the students are able to

CO 1: Judge and identify proper material and component for a railway track

CO 2: Design various component of a track.

CO 3: State importance of a railway station.

CO 4: Plan various amenities of an airport planning and runway design.

CO 5: Describe various features of a harbor and a port to enable for proper design and maintenance of various amenities

UNIT I

Railway Engineering: Introduction Role of railways in transportation; Comparison of railway and highway transportation; Development of railway systems with particular reference to India; Classification of railways.

Railway Track: Permanent way: Gauges in Railway track, Railway track cross – sections; Coning of wheels.

Rails & Rail Joints: Functions of rails; Requirements of rails; Types of rails sections; Standard rail sections; Length of rails; Rail failures; Wear on rails. Requirements of an ideal joint; Types of rail joints; Welding of rails.

Sleepers: Functions of sleepers; Requirements of sleepers; Classification of Sleepers – Timber sleepers, Metal sleepers & Concrete sleepers; Comparison of different types of sleepers.

UNIT II

Fish Plates: Fish plates, section of fish plates, and failure of fish plates.

Geometric Design Of Track: Necessity; Gradients & Gradient Compensation; Elements of horizontal alignment; Super elevation; Cant deficiency and cant excess; Negative Super elevation; Length of Transition Curve, Length of vertical curve.

Points And Crossings: Functions of components of turnout; Crossings.

UNIT III

Ballast: Functions and requirements of ballast; Types of ballast; Renewal of ballast

Stations And Yards: Site selection for railway station; Requirements of railway station; Classifications; Station yards; Level crossing.

Signalling: Objects of signaling; Classification of signals; Controlling- absolute block system. Standards of inter locking

UNIT IV

AIRPORT PLANNING AND DESIGN: Introduction Development of air transportation system with particular reference to India; Aeroplane components; Air–craft characteristics.

Airport planning and layout: Selection of site; Apron; Hanger; Typical airport layouts; Airport marking; Airport lighting; Drainage systems.

Airport Obstruction: Zoning laws; Classification of obstructions; imaginary surfaces; Approach zone; Turning zone.

Runway Design: Runway orientation; Basic runway length; Corrections for elevation; Temperature and gradient; Runway geometric design.

Specifications for Structural Design of Airport Pavements: Design factors methods for flexible and rigid pavements; LCN system of pavement design.

UNIT V

DOCKS AND HARBOUR ENGINEERING: Introduction Types of water transportation; Economics and advantages of water transportation.

Planning and Design Of Port Facilities: General layout and design considerations; Pier and wharf structures; Fender systems; Transit sheds and Apron; Container ports; Docks; Dredging; Light Houses.

TEXT BOOK(s):

1. Railway Engineering by S.C.Saxena and S.Arora , Dhanpat Rai & sons.
2. Airport Planning and Design by S. K. Khanna & M. G. Arora, 6th Edition, Nemchand & Bros, 1999.
3. Dock, harbour engineering by rangawala

REFERENCE BOOK(s):

1. Railway Engineering by M.M.Agarwal and Satish Chandra, Oxford University Press, 2007.
2. Airport Engineering by G.V.Rao; Tata Mc Graw Hill, 1991

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IV B.TECH I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
CODE: R20CC30E02	2	0	2	30	70	100	3
LOW COST HOUSING							

COURSE OBJECTIVES: To understand about the Low cost housing techniques adopted in civil engineering field.

COURSE OUTCOMES:

CO 1: Understand about the Housing scenario and Housing finance concepts.

CO 2: Understand about the Land Use and Physical Planning for Housing and Housing the Urban Poor

CO 3: Understand about the Development and Adopt on of Low-Cost Housing Technology

CO 4: Understand about the Low Cost Infrastructure Services and Rural Housing

CO 5: Understand about the Housing in Disaster Prone Areas

UNIT – I

Housing Scenario Status of urban housing- Status of Rural Housing,

Housing Finance: Introducing- Existing finance system in India- Government role as facilitator
Status at Rural Housing Finance- Impedimental in housing finance and related issues

UNIT- II

Land Use and Physical Planning for Housing:

Planning of urban land- Urban land ceiling and regulation act- Effectincey of building bye laws - Residential Densities

Housing the Urban Poor: Living conditions in slums- Approaches and strategies for housing urban poor

UNIT-III

Development and Adopt on of Low-Cost Housing Technology

Adoption of innovative cost effective construction techniques- Adoption of precast elements in partial prefabrication- Adopting of total prefabrication of mass housing in India- General remarks on pre cast rooting/flooring systems- Economical wall system- Single Brick thick loading bearing wall- 19cm thick load bearing masonry walls- Half brick thick load bearing wall-Fly ash, gypsum

thick for masonry- Stone Block masonry- Adoption of precast R.C. plank and join system for roof/floor in the building

Alternative Building Materials for Low Cost Housing: Substitute for scarce materials- Ferro cement- Gypsum boards- Timber substitutions- Industrial wastes- Agricultural wastes

UNIT- IV

Low Cost Infrastructure Services

Present status- Technological options- Low cost sanitation's- Domestic wall- Water supply energy

Rural Housing: Introduction- traditional practice of rural housing continuous- Mud Housing technology- Mud roofs- Characteristics of mud- Fire resistant treatment for thatched roof- Soil stabilization- Rural Housing programs

UNIT-V

Housing in Disaster Prone Areas

Earthquake- Damages to houses- Traditional Houses in disaster prone areas Type of Damages and Railways of non-engineered buildings- Repair and restore action of earthquake Damaged non-engineered buildings recommendations for future constructions- Requirements of structural safety of thin precast roofing units against - Earthquake forces- Status of R&D in earthquake strengthening measures- Floods- cyclone- future safety

TEXT BOOKS:

1. Building materials for low –income houses – International council for building research studies and documentation.
2. Modern trends in housing in development countries – A.G. Madhava Rao, D.S. Ramachandra Murthy & G. Annamalai
3. Light weight concrete- Academic Kiado- Rudhai. G – Publishing home of Hungarian Academy of Sciences 1963.

REFERENCE BOOKS:

1. Building Systems for Low Income Housing, Ashok Kumar Jain; Management Publishing House, 1992
2. Hand book of low-cost housing - by A. K. Lal – Newage international publishers.

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3. Low Cost Housing in Developing Countries, Guru Charan Mathur; For Centre for Science & Technology of the Non-Aligned and Other Developing Countries, Oxford & IBH Publishing Company, 1993

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IV B.TECH I-SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
CODE: R20CC40E01	2	0	2	30	70	100	3
ENVIRONMENTAL POLLUTION & CONTROL							

COURSE OBJECTIVES:

The objective of this course is:

- Impart knowledge on fundamental aspects of air pollution & control, noise pollution, and solid waste management.
- Provide basic knowledge on sustainable development.
- Introduces some basics of sanitation methods essential for protection of community health.
- Provide basic knowledge on solid waste management.

COURSE OUTCOMES:

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

CO 1: Identify the air pollutant control devices

CO 2: Have knowledge on the NAAQ standards and air emission standards

CO3: Differentiate the treatment techniques used for sewage and industrial wastewater treatment methods.

CO4: Understand the fundamentals of solid waste management, practices adopted in his town/village and its importance in keeping the health of the city.

CO 5: Appreciate the methods of environmental sanitation and the management of community facilities without spread of epidemics.

SYLLABUS:

UNIT – I

Air Pollution: Air pollution Control Methods–Particulate control devices – Methods of Controlling Gaseous Emissions – Air quality standards.

Noise Pollution: Noise standards, Measurement and control methods – Reducing residential and industrial noise – ISO14000.

UNIT –II

Industrial Wastewater Management: – Strategies for pollution control - Volume and Strength

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reduction – Neutralization – Equalization – Proportioning – Common Effluent Treatment Plants -
Recirculation of industrial wastes – Effluent standards.

UNIT – III

Solid Waste Management: Solid waste characteristics – basics of on-site handling and collection
– separation and processing – Incineration-Composting-Solid waste disposal methods –
fundamentals of Land filling.

UNIT – IV

Environmental Sanitation: Environmental Sanitation Methods for Hostels and Hotels, Hospitals,
Swimming pools and public bathing places, social gatherings (melas and fares), Schools and
Institutions, Rural Sanitation-low cost waste disposal methods.

UNIT- V

Sustainable Development: Definition- elements of sustainable developments -Indicators of
sustainable development- Sustainability Strategies- Barriers to Sustainability–Industrialization
and sustainable development – Cleaner production in achieving sustainability- sustainable
development.

TEXT BOOKS:

1. Environmental Engineering, by Ruth F. Weiner and Robin Matthews – 4th Edition Elsevier, 2003.
2. Environmental Science and Engineering by J.G. Henry and G.W. Heinke – Pearson Education.
3. Environmental Engineering by Mackenzie L Davis & David A Cornwell. McGraw Hill Publishing.

REFERENCE BOOKS:

1. Air Pollution and Control by M.N. Rao & H.N. Rao
2. Solid Waste Management by K. Sasi Kumar, S.A. Gopi Krishna. PHI New Delhi.
3. Environmental Engineering by Gerard Kiley, Tata McGraw Hill.
4. Industrial Water Pollution Control by Nemerow Jr., McGraw Hill Publishing.
5. Unit Operations and Processes in Environmental Engineering by Reynolds. Richard – Cengage Learning.
6. Environmental Engineering by D. Srinivasan, PHI Learning Private Limited, New Delhi, 2011.

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IV B.TECH II SEMESTER	L	T	P	INTERNAL MARKS	EXTERNAL MARKS	TOTAL MARKS	CREDITS
	3	-	-	40	60	100	3
CODE:R20CC4OE02	CONSTRUCTION TECHNOLOGY AND MANAGEMENT						

COURSE OBJECTIVE

- To introduce to the student the concept of project management including network drawing and monitoring.
- To introduce the concept of cost control and resource management.
- To introduce the importance of safety in construction projects.
- To introduce the various equipment related to construction like earth moving equipment, trucks and handling equipment, construction equipment and machinery.

COURSE OUTCOMES:

CO1: Upon the successful completion of this course, the students will be able to:

CO2: Appreciate the importance of construction planning and Project Management.

CO3: Apply the gained knowledge to project Planning and Control.

CO4: Apply the concept of Quality control and Safety Management in construction.

CO5: To find out the function of various construction equipment's.

UNIT- I INTRODUCTION: Construction projects- Project management- Main causes of project failure, Origin of PERT and CPM, Planning, Scheduling and controlling, Bar charts, Milestone charts, weaknesses in Bar charts, PERT and CPM networks – Comparison, Event, Activity, Rules for drawing networks, Numbering the events (Fulkerson's law), Dummy activities.

UNIT -II PROJECT MANAGEMENT THROUGH NETWORKS: Time estimate-Expected time, Earliest allowable occurrence time, Latest allowable occurrence time, slack, project duration, probability of completion, Start and Finish time estimates, Floats, Project scheduling, Critical and sub-critical path. Updating – Process of updating.

COST CONTROL: Direct cost- indirect cost- total project cost- Optimization of cost through networks- Steps involved in optimization of cost.

UNIT- III PROJECT PLANNING & ORGANIZATION: Development of project plan, objective and conception– Programming – Scheduling – Project Organization – Project budget fund flow statement – Controlling system.

CONTRACTS: Introduction – Types of Contract – Contract document – Specifications –

Important conditions of contract – Tender and tender document – Deposits by the contractor – Arbitration – M. Book, R.A Bills & Advances – Muster Roll.

UNIT- IV RESOURCE MANAGEMENT: Introduction- Resource smoothing- Resource levelling- Objectives of material management- Costs- Functions of material management department- ABC classification of materials-Introduction to Green Technologies-NBC code book-2016.

UNIT- V QUALITY CONTROL AND SAFETY MANAGEMENT: Importance of quality- Elements of quality- Organization for quality control- Quality assurance techniques- Total quality management- ISO – 9000. Accident prevention programme- immediate attention in case of accident- Approaches to improve safety in construction- Safety benefits, Prevention of fires in construction industries- Safety information system.

TEXT BOOKS:

1. Construction Engineering and Management by Dr. S. Seetharaman- Umesh Publications, Nai Sarark, Delhi.
2. Fundamentals of PERT/CPM and Project Management by S. K. Bhattacharjee- Khanna Publishers, Nai Sarak- Delhi.
3. S. Sanga Reddy & Meyyappan, "Construction Management", Kumaran Publications, 2009.
4. Gahlot, P.S & Dhir, D.M., "Construction Planning and Management", Wiley Eastern Limited, 1992.
5. Punmia B.C., "Project Planning and Control with PERT and CPM", Laxmi Publications, New Delhi, 1987.

REFERENCE BOOKS:

1. Construction Management & Planning by B. Sengupta & H. Guha- Tata Mc Graw – Hill Publishing Co. Ltd., New Delhi.
2. Construction Planning, Equipment & Methods by Peurifoy R. L. - Mc Graw – Hill International Book Company.
3. PERT and CPM – Punmia, Laxmi Publications, 3rd edition 1987.
4. PERT & CPM Principles and applications by L. S. Srinath- Affiliated East West Press.
5. Jerome D. Wiest & K. Levy, "Management Guide to PERT/CPM".
6. Clough R.H. & Sears. G.A, "Construction Project Management" 2008.

E-LEARNING: NPTEL-<http://nptel.ac.in/courses/105103093/>

