

Text Books/References:

1. Grigg, Neil, Infrastructure engineering and management, Wiley, (1988).
2. Haas, Hudson, Zaniewski, Modern Pavement Management, Krieger, Malabar, (1994).
3. Hudson, Haas, Uddin, Infrastructure management: integrating design, construction, maintenance, rehabilitation, and renovation, McGraw Hill, (1997).
4. Munnell, Alicia, Editor, Is There a Shortfall in Public Capital Investment Proceedings of a Conference Held in June (1990).
5. World Development Report 1994: Infrastructure for Development (1994).
6. Zimmerman, K. and F. Botelho, "Pavement Management Trends in the United States," 1st European Pavement Management Systems Conference, Budapest, September (2000).

Course Outcomes:

On the completion of this course, the student will be able to:

- a. Design an integrated framework for infrastructure planning and management.
- b. Analyse the strategies for Infrastructure Project implementation.
- c. Perform Infrastructure modelling and Life Cycle Analysis Techniques.

SYLLABUS	(SEMESTER-VIII)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
<i>Subject Code:</i>	CE08TPE07B									
<i>Subject:</i>	Traffic Engineering	3	0	0	15	15	30	70	100	03

Course Objectives:

1. To develop the basic knowledge of Traffic Engineering.
2. To define Traffic flow characteristic.
3. To develop knowledge about traffic control system.
4. To understand the parking and highway lighting
5. To develop the knowledge of different pollution occurring and its remedial measures.

Course Content:

UNIT 1: Introduction To Traffic Engineering-Definition and Scope of Traffic Engineering, Functions, Organization and Importance of Traffic Engineering. Elements of Traffic Engineering: Vehicular, Driver and Road Characteristics.

UNIT 2: Traffic Flow Parameters -Traffic flow parameters: volume, density, speed and related terms, Relationship between various parameters, Study and analysis of vehicle arrivals, headways, and gap acceptance in traffic flow. Highway Capacity and Level of Service.

UNIT 3: Traffic Control-Definition, functions and importance of traffic control. Methods of traffic control: Traffic signs, Road Markings, and other traffic controls aids. Traffic Regulation. Intersection control and design of traffic signals.

UNIT 4: Parking- Parking survey, types of parking, design of parking places. Lighting-Lantern arrangement, Types of lamp

UNIT 5: Traffic and Environment- Pollution problems of cities, Detrimental effects of traffic on environment, Noise pollution, Air pollution, Vibration, Environmental Impact Assessment.

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Text Books:

1. Kadiyal L.R., "Traffic Engg. and Transport Planning", 8th edition, Khanna Publishers.
2. Partha chakrobarty & Animesh Das, "Principles of Transportation Engineering", PHI.
3. C. Jotin Khisty, B. Kent Lal, "Transportation Engineering – An Introduction", PHI.

Course Outcomes:

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

1. estimate the basic characteristics of traffic stream
2. conduct traffic flow studies and analyze traffic data
3. design traffic signal systems
4. analyse the parking and highway lighting
5. manage controlling the different pollution occurring in road.

SYLLABUS (SEMESTER-VIII)	Periods/ Week	Internal Assessment (IA)			ESE	Grand Total	Credits			
		L	T	P				CT-I	CT-II	TOTAL
<i>Subject Code:</i>	CE08TPE07C									
<i>Subject:</i>	Repair and Rehabilitation of Structures	3	0	0	15	15	30	70	100	03

Course learning objectives:

- To learn about various distress and damages in concrete and steel structures.
- To learn about assess the damage to structures using various methods.
- To study the various methods of rehabilitation.
- To study the various methods of repairs of structures.
- To learn importance of repair and maintenance of structures.

Course Content:

UNIT 1: Aging of structures – performance of structures – need for rehabilitation.

Distress in concrete / steel structures – damage – source – cause – effects – case studies.

UNIT 2: Damage assessment and Evaluation models – Damage testing methods – NDT – Core samples.

UNIT 3: Rehabilitation methods – grouting – detailing – imbalance of structural stability – case studies.

UNIT 4: Methods of repairs – shotcreting – guniting – epoxy – cement mortar injection – crack ceiling.

UNIT 5: Repair and maintenance of buildings – IS standards – Bridge repairs – Seismic strengthening.

Reading/Textbooks:

1. Diagnosis and treatment of Structures in Distress – R N Raikar.
2. Bridge Rehabilitation – V K Raina.
3. Building Failures – Diagnosis and Avoidance – W H Ranson.
4. Forensic Engineering – Kenneth and Carper.

Course outcomes:

Upon completion of this course students will be able to:

- Analyze distress and damages in concrete and steel structures.
- Understand about assess the damage to structures using various methods.

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- Classify the various methods of rehabilitation.
- Classify the various methods of repairs of structures.
- Understand the importance of repair and maintenance of structures.

SYLLABUS	(SEMESTER-VIII)	Periods/Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
<i>Subject Code:</i>	CE08TPE07D									
<i>Subject:</i>	Finite Element Analysis	3	0	0	15	15	30	70	100	03

Course Objectives:

1. To learn basic principles of finite element analysis procedure.
2. To learn the theory and characteristics of finite elements that represent engineering structures.
3. To learn and apply finite element solutions to structural and dynamic problem to develop the knowledge and skills needed to effectively evaluate finite element analyses.

Course Content:

UNIT 1: Matrix Methods of Structural Analysis – Review of concepts – Actions and displacements – compatibility – indeterminacy – Member and joint loads – Flexibility Matrix formulation - Stiffness Matrix formulation.

UNIT 2: Analysis of Beams- Finite Element formulation and Analysis of beams by Finite Element method.

UNIT 3: Analysis of Rigid Jointed Plane Frame- Finite Element formulation and Analysis of rigid jointed plane frame by Finite Element method.

UNIT 4: Analysis of Pin Jointed Plane Frame- Finite Element formulation and Analysis of pin jointed plane frame by Finite Element method.

UNIT 5: Introduction to Plate and Shell Elements- Analysis of plane stress / strain and ax symmetric solids-triangular, quadrilateral and isoperimetric elements, Analysis of plate bending, basic equations of thin plate theory, Reissner-Mindlin theory, plate elements and applications. Analysis of shells, degenerated shell elements.

Text Books:

1. Chandrupatla T.R., Belegundu A.D., Introduction to Finite Elements in Engineering, Prentice Hall of India Private Limited, New Delhi.
2. Desai C.S., Abel J.F., Introduction to the Finite Element Method, CBS Publishers & Distributors, Delhi.

Reference Books:

1. Krishnamurthy, C.S., Finite Element Analysis – Theory and Programming, Tata McGraw Hill Publishing Company Limited, New Delhi.
2. Finite Element Analysis – Theory and Programming by Cook R.D. et.al., Concepts and Applications of Finite Element Analysis, John Wiley

Course outcomes:

- Upon successful completion of this course, you should be able to:
1. Understand the concepts behind formulation methods in FEM.
 2. Identify the application and characteristics of FEA elements such as bars, beams, plane.
 3. Analyze the rigid and pin jointed plane frame using finite element method.

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SYLLABUS	(SEMESTER VIII)	Periods/Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
Subject Code:	CE0819007B	4	1	0	15	15	30	70	100	03
Subject:	Urban Hydrology and Hydraulics	3	0	0	15	15	30			

Course Objectives:

1. To describe physical properties of urban area.
2. To understand the elements of drainage systems.
3. To study about urban water supply.
4. To know about the measures to control storm water pollution.
5. To learn urban watershed software.

Course Content:

UNIT 1: Urbanisation: Process of urbanisation, Trends of urbanisation and industrialisation, influence on hydrologic cycle, effects and consequences for drainage, Rainfall analysis in urban environment, design storm, Urban Runoff computations: Empirical, Time-area and unit hydrograph approaches, Urban storm water runoff: overland flow.

UNIT 2: Design of drainage system elements: Hydraulic fundamentals, infiltration and on-site detention of storm water, design of sewerage and drainage channels, design of appurtenances, road drainage, design of pumping stations.

UNIT 3: Urban water supply: Estimate of demand, sources in surface and groundwater, Reservoir, capacity estimation.

UNIT 4: Control of storm water pollution: Pollution build-up and wash off process with reference to urban drainage systems. Source control in commercial and industrial complexes, storage options - dry and wet ponds, biological treatment of wastewater, chemical treatment of storm water.

UNIT 5: Introduction to urban watershed software - Hydrologic Cistem, water conservation and ecological aspects, Water harvesting.

TEXT BOOKS:

1. Chow V T, Handbook of Applied Hydrology: A Compendium of Water resources technology, McGraw Hill, New York, 1964.
2. Gupta R S, Hydrology and Hydraulic Systems, Prentice Hall Publishers, New Jersey, 1989.
3. Geiger W F, Musialik J Z, and Krawls G J, Manual on Drainage in Urban Areas, 2 Volumes, UNESCO, Paris, 1987.
4. Hall M J, Urban Hydrology, Elsevier Applied Science Publishers, New York, 1984.
5. Stahre P, and Urboms B, Stormwater Detention for Drainage, water quality and CSO Management, Prentice Hall Publishers, New Jersey, 1983.
6. Wanielista M P, and Yousif Y A, Stormwater Management, John Wiley and Sons, New York, 1983.

Course Outcome: At the end of the course students shall be able to:

1. Understand and explain the effects of urbanization on rainfall and runoff.
2. Design various urban drainage system elements.
3. Estimate the demand of urban areas.
4. Identify and apply the control required for storm water pollution.
5. Use urban watershed software for simulation purpose.

SYLLABUS		(SEMESTER-VIII)					
<i>Subject Code:</i>	CE08TOE03X	CREDITS: 3			Internal Assessment (IA)		
<i>Subject:</i>	Open Elective -3X	L	T	P	CT-I	CT-II	TOTAL
		3	-	-	15	15	30
Open Elective-3A or Open Elective-3B or Open Elective-3C or Open Elective-3D		Any one subject to be Selected from the Open Electives Group 3					
Open Electives Group 3							
CE08TOE03A		Management Information System					
CE08TOE03B		Enterprise Resource Planning					
CE08TOE03C		Cyber Law and Ethics					
CE08TOE03D		Human Resources Development and Organizational Behaviour					

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SYLLABUS	(SEMESTER-VIII)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
<i>Subject Code:</i>	CE08TOE03A									
<i>Subject:</i>	Management Information System	3	0	0	15	15	30	70	100	03

Course objectives:

- To study about the role of management information technology in organizations.
- To study about the fundamental principles of computer-based information system analysis.
- To learn about the design and develop an understanding of the principles and techniques used.
- To study about concept of data moulding and data flow diagrams of information system.
- To learn about the fundamental principles and concept of decision-making process and security system.

Course Content:

UNIT 1: Management and System- Advance in management, the process of MIS development, MIAS organization, Information dynamics.

UNIT 2: Planning, Design and implementation of MIS, Strategic planning, MIS design- Group design concepts, Acquiring information system.

UNIT 3: System life cycle-Information flow, Entity relationship modelling, data modelling, detailed process analysis, data flow diagrams.

UNIT 4: Decision making system with MIS, System concepts for MIS.

UNIT 5: Data information and communication, problem solving and decision making, security, control and failure, Future trends in MIS.

TEXT BOOKS:

1. Management Information Systems, by S. Sadagopan, PHI Learning Pvt. Ltd
- Management Information Systems By. Chatterjee, PHI Learning Pvt. Ltd
- Management Information Systems (11th Edition), by Ken Laudon and Jane Laudon

Course outcomes:

Upon completion of this course students will be able to:

- To understand the role of management information technology in organizations.
- To understand the fundamental principles of computer-based information system analysis.
- To design and develop an understanding of the principles and techniques used.
- To understand the concept of data moulding and data flow diagrams of information system.
- To understand the fundamental principles and concept of decision-making process and security system.

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SYLLABUS	(SEMESTER-VIII)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
<i>Subject Code:</i>	CE08TOE03B									
<i>Subject:</i>	Enterprise Resource Planning	3	0	0	15	15	30	70	100	03

Course objectives:

1. To provide a contemporary and forward-looking on the theory and practice of Enterprise Resource Planning Technology.
2. To focus on a strong emphasis upon practice of theory in Applications and Practical oriented approach.
3. To train the students to develop the basic understanding of how ERP enriches the business organizations in achieving a multidimensional growth.
4. To aim at preparing the students technological competitive and make them ready to self-upgrade with the higher technical skills

Course Content:

UNIT 1: Conceptual foundation of Business Process reengineering: Role of information Technology and BPR; Process improvement and Process redesign, Process identification and mapping; Role/Activity diagrams, Process Visioning, and benchmarking.

UNIT 2: Enterprise Resource Planning: Evolution of ERP- MRP and MRP II, structure of ERP- two tier architecture, three tier architectures, electronic data processing, management information system, Executive information system, ERP as an integrator of information needs at various Levels.

UNIT 3: Typical Business Processes: Core processes, Product control, Sales order processing, Purchases, Administrative processes, Human resource, Finance support processes, Marketing, Strategic planning, Research and development, Problems in traditional view.

UNIT 4: ERP models/functionality: Sales order processing, Production scheduling, forecasting, distribution, finance, features of each of the models, description of data flow across each module, overview of supporting databases & packages.

UNIT 5: ERP implementation issues: Opportunities and problems in ERP selection, and implementation; ERP implementation: identifying ERP benefits, team formation, Consultant intervention, Selection of ERP, Process of ERP.

TEXT BOOKS:

1. V.K. GARG & N.K. VENKATKRISHNAN: ERP, Concepts and Practices, PM
2. Rahul V. Altekar, Enterprise-wide Resource Planning-theory and practice, PHI

REFERENCES:

ALEXIS LEON: Enterprise Resource Planning, TMH S. SADAGOPAN: MIS, PMV. RAJARAMAN: Analysis and Design of Information Systems, PHIMONK' & BRADY: Concepts in ERP, Vikas pub, Thomson

Course outcomes:

- After completing this course, student will be able to
1. Make basic use of Enterprise software, and its role in integrating business functions
 2. Analyze the strategic options for ERP identification and adoption.
 3. Design the ERP implementation strategies.
 4. Create reengineered business processes for successful ERP implementation.

SYLLABUS	(SEMESTER VIII)	Periods/Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
<i>Subject Code:</i>	CE08TOE03C							70	100	3
<i>Subject:</i>	Cyber Law and Ethics	3	0	0	15	15	30			

Course Learning Objectives:

1. To Create cyber security awareness and to understand principles of web security.
2. To make attentive to students about possible hacking and threats in this communication era.
3. To understand key terms and concepts in cyber law, cybercrimes, intellectual property, Copyright trademarks and domain theft.
4. To understand the business impact and potential of e-commerce and to learn about the technologies required to make e-Commerce viable.
5. Discuss Issues for creating Security Policy, Jurisdictional Issues and dispute resolution in cyberspace.

Course Content:**UNIT-1**

Introduction Computers and its Impact in Society, Overview of Computer and Web Technology, Need for Cyber Law, Cyber Jurisprudence at International and Indian Level, Cyber Law - International Perspectives UN & International Telecommunication Union (ITU) Initiatives Council of Europe - Budapest Convention on Cybercrime, Asia-Pacific Economic Cooperation (APEC), Organization for Economic Co-operation and Development (OECD), World Bank, Commonwealth of Nations.

UNIT-2 Constitutional & Human Rights Issues in Cyberspace Freedom of Speech and Expression in Cyberspace, Right to Access Cyberspace – Access to Internet, Right to Privacy, Right to Data Protection, Cyber Crimes & Legal Framework Cyber Crimes against Individuals, Institution and State, Hacking, Digital Forgery, Cyber Stalking/Harassment, Cyber Pornography, Identity Theft & Fraud Cyber terrorism, Cyber Defamation.

UNIT-3 Cyber Torts Cyber Defamation, Different Types of Civil Wrongs under the IT Act 2000, Intellectual Property Issues in Cyber Space Interface with Copyright Law, Interface with Patent Law, Trademarks & Domain Names Related issues

UNIT- 4 E-Commerce Concept, E-commerce-Salient Features, Online approaches like B2B, B2C & C2C Online contracts, Click Wrap Contracts, Applicability of Indian Contract Act, 1872,

UNIT- 5 Dispute Resolution in Cyberspace, Concept of Jurisdiction, Indian Context of Jurisdiction and IT Act, 2000. International Law and Jurisdictional Issues in Cyberspace, Dispute Resolutions .

Text Books:

1. Chris Reed & John Angel, Computer Law, OUP, New York.
2. Justice Yatindra Singh, Cyber Laws, Universal Law Publishing Co, New Delhi.
3. Verma S, K, Mittal Raman, Legal Dimensions of Cyber Space, Indian Law Institute.
4. Jonthan Rosenoer, Cyber Law, Springer, New York.
5. Sudhir Naib, The Information Technology Act, 2005: A Handbook, OUP, New York.
6. S. R. Bhansali, Information Technology Act, 2000, University Book House Pvt. Ltd.

Course Outcomes- After successful completion of the course, students

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1. Will be able to analyse and evaluate the cyber security needs of an organization.
2. Will be able to implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.
3. Will be able to understanding of the fundamental legal principles relating to confidential information, copyright, patents, designs, trademarks and unfair competition;
4. Will be able to apply the skills necessary for large-scale web based e-commerce project development and e-commerce application.

Design operational and strategic cyber security strategies and policies for dispute resolution in cyberspace.

SYLLABUS	(SEMESTER-VIII)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
Subject Code:	CE08TOE03D									
Subject:	Human Resources Development and Organizational Behavior	3	0	0	15	15	30	70	100	03

Course Content:

UNIT 1: HRD-Macro Perspective: HRD Concept, Origin and Need, HRD as a Total System; Approaches to HRD; Human Development and HRD; HRD at Macro and Micro Climate.

UNIT 2: HRD-Micro Perspective: Areas of HRD; HRD Interventions Performance Appraisal, Potential Appraisal, Feedback and Performance Coaching, Training, Career Planning, OD or Systems Development, Rewards, Employee Welfare and Quality of Work Life and Human Resource Information; Staffing for HRD: Roles of HR Developer; Physical and Financial Resources for HRD; HR Accounting; HRD Audit, Strategic HRD

UNIT 3: Instructional Technology for HRD: Learning and HRD; Models and Curriculum; Principles of Learning; Group and Individual Learning; Transactional Analysis; Assessment Centre; Behaviour Modeling and Self-Directed Learning; Evaluating the HRD

UNIT 4: Human Resource Training and Development: Concept and Importance; Assessing Training Needs; Designing and Evaluating T&D Programmes; Role, Responsibilities and challenges to Training Managers.

UNIT 5: Training Methods: Training with in Industry (TWI): On the Job & Off the Job Training; Management Development: Lecture Method; Role Play; In-basket Exercise; Simulation; Vestibule Training; Management Games; Case Study; Programmed Instruction; Team Development; Sensitivity Training; Globalization challenges and Strategies of Training Program, Review on T&D Programmes in India.

Reference Books:

1. Nadler, Leonard: Corporat Human Resource Development, Van Nostrand Reinhold, ASTD, New York.
2. Rao, T.V and Pareek, Udai: Designing and Managing Human Resource Systems, Oxford IBH Pub. Pvt.Ltd., New Delhi, 2005.
3. Rao, T.V: Readings in HRD, Oxford IBH Pub. Pvt. Ltd., New Delhi, 2004.
4. Viramani, B.R and Seth, Parmila: Evaluating Management Development, Vision Books, New Delhi.
5. Rao, T.V. (et.al): HRD in the New Economic Environment, Tata McGraw-Hill Pub.Pvt, Ltd., New Delhi, 2003.
6. Rao, T.V: HRD Audit, Sage Publications, New Delhi.

1. Katz, David and Training Methods for Management Development Book, McGraw Hill, New York
2. Katz, D. V. Human Resource Development, Sage Publications, New Delhi. 3. Katz, David Human Resource Development and Training in Practice, McGraw Hill, New York

SYLLABUS	(SEMESTER-VIII)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
<i>Subject Code:</i>	CE08PPC11							80	200	07
<i>Subject:</i>	Major Project	0	0	14	-	-	120			

SYLLABUS	(SEMESTER-VIII)	Periods/ Week			Internal Assessment (IA)			ESE	Grand Total	Credits
		L	T	P	CT-I	CT-II	TOTAL			
<i>Subject Code:</i>	CE08PPC12							20	50	1.5
<i>Subject:</i>	Structural Detailing Lab	0	0	3	-	-	30			

Course Learning Objective:

- To learn detailing of structural steel members (tension & compression member, steel connection)
- To study in detail and draw components of industrial building.
- To understand reinforcement detailing of RCC beams and column footings.
- To know about distribution of reinforcement in slab, stair case, water tank and retaining wall.

Course Content:

Part A: (Steel Structures)

1. Detailing of Tension Members.
2. Detailing of Built-up Compression Members.
3. Detailing of Column Bases.
4. Detailing of connections.
5. Detailing of an Industrial shed.
6. Detailing of a Plate girder/Gantry girder.

Part B: (Reinforced Concrete Structures)

1. Details of reinforcement in RCC Continuous Beams.
2. Details of reinforcement for RCC column with isolated footings.
3. Details of reinforcement in a one way/two-way slabs.
4. Details of reinforcement in stair cases.
5. Detailing of Combined footings.
6. Detailing of Retaining walls/Water Tanks.

Course Outcome:

- To sketch detailed drawing of structural steel beams, columns and connections.
- To understand design components of industrial shed and gantry girder.
- To sketch reinforcement detailing of RCC member as per IS code provision.
- To draw accurate arrangement of reinforcement in slab, stair case, water tank and retaining wall.