

Course Code	Course Name	L-T-P-Credits	Year of Introduction
CE402	ENVIRONMENTAL ENGINEERING – II	3-0-0-3	2016

**Prerequisites: CE405 Environmental Engineering- I**

**Course objectives:**

- To understand the various sources and characteristics of wastewater
- To know the various treatment methods available for wastewater treatment

**Syllabus :** Wastewater, sources, characteristics, oxygen demand Design of sewers, Circular sewers, Partial flow and full flow conditions. Sewer appurtenances, Disposal of wastewater, Streeter Phelps equation, Oxygen sag curve, Treatment methods, Aerobic and anaerobic methods, Design of various treatment units-Screening, Grit chamber, Sedimentation tank, Activated Sludge process, Trickling filter, Rotating biological contactor, Septic tanks, Imhoff tanks, Oxidation ditches, Oxidation ponds, Upflow anaerobic sludge blanket reactors, Sludge digestion, Sludge drying bed.

**Course Outcomes:**

The students will

- have an understanding of the various types of treatment methods for wastewater
- know the design aspects of various treatment units in a wastewater treatment plant.

**Text Books**

1. B.C Punmia , “Waste Water Engineering”, Laxmi Publications Pvt. Ltd, 2012
2. Howard S Peavy, Donald R Rowe, George Tchobanoglous, Environmental Engineering, Mc Graw Hill Education, 1984
3. P N Modi, “Sewage Treatment & Disposal and Waste water Engineering”, Standard Book House, NewDelhi, 2e, 2008.
4. S.K. Garg , “Sewage disposal and Air pollution Engineering”, Khanna Publishers, 2008
5. G S Birdie, Water Supply and Engineering, Dhanpat Rai Publishing Company, 2014

**References**

1. G. L. Karia, R.A. Christian, Wastewater treatment: Concepts And Design Approach, PHI learning Pvt Ltd, 2013
2. J. Arceivala, Shyam R. Asolekar, Wastewater Treatment for Pollution Control and Reuse, McGrawhill Education, 2007
3. K N Duggal, Elements of Environmental Engineering, S Chand Publications, 2007
4. Mackenzie L Davis, Introduction to Environmental Engineering, McGraw Hill Education (India), 5e, 2012
5. Metcalf and Eddy, “Waste Water Engineering”, Tata McGraw Hill publishing Co Ltd, 2003

**COURSE PLAN**

Module	Contents	Hours	Sem. Exam Marks %
I	Wastewater- Sources and flow rates, Domestic wastewater, Estimation of quantity of wastewater, Dry weather flow, storm water flow, Time of concentration  Sewers, Design of circular sewers under full and partial flow	6	15

	conditions		
<b>II</b>	Sewer appurtenances-Man holes, Catch basin, flushing devices, Inverted siphon. Ventilation of sewers.  Sewage, Sewerage, Systems of sewerage  Sewage characteristics- Physical, chemical and biological parameters, Biological oxygen demand, first stage BOD, Chemical oxygen demand, Relative stability, Population equivalent.	7	15
<b>FIRST INTERNAL EXAMINATION</b>			
<b>III</b>	Waste water disposal systems- Self purification of streams, Dilution -Oxygen sag curve, Streeter Phelp's Equation, land treatment  Treatment of sewage-Preliminary and Primary treatment -Theory and design of Screen, Grit chamber, Detritus chamber, Flow equalization tank and Sedimentation tank.	6	15
<b>IV</b>	Secondary treatment methods-Contact bed, Intermittent sand filter, Theory and design of Trickling filter, Activated sludge process, Trickling filter-High rate, standard. Rotating biological contactor	7	15
<b>SECOND INTERNAL EXAMINATION</b>			
<b>V</b>	Design of Septic tank and Imhoff tank,  Principle and working of Oxidation ditch and oxidation ponds. Aerated lagoons, Design of upflow anaerobic sludge blanket reactors	8	20
<b>VI</b>	Sludge treatment and disposal-Methods of thickening, Sludge digestion- Anaerobic digestion, Design of sludge digestion tanks and Sludge drying beds, methods of sludge disposal	8	20
<b>END SEMESTER EXAMINATION</b>			

• **EXTERNAL EVALUATION:**

**Maximum Marks :100**

**Exam Duration: 3 Hrs**

**QUESTION PAPER PATTERN (External Evaluation) :**

Part A -Module I & II : 2 questions out of 3 questions carrying 15 marks each

Part B - Module III & IV: 2 questions out of 3 questions carrying 15 marks each

Part C - Module V & VI: 2 questions out of 3 questions carrying 20 marks each

**Note :** 1.Each part should have at least one question from each module

2.Each question can have a maximum of 4 subdivisions (a,b,c,d)

Course Code	Course Name	L-T-P-Credits	Year of Introduction
<b>CE404</b>	<b>CIVIL ENGINEERING PROJECT MANAGEMENT</b>	<b>3-0-0-3</b>	<b>2016</b>

**Prerequisite: HS300 Principles of Management**

**Course objectives:**

- To impart knowledge on principles of planning and scheduling projects, with emphasis on construction.
- To understand the uses and suitability of various construction equipment,
- To study the legal and ethical issues related to construction projects
- To become familiar with TQM and similar concepts related to quality
- To impart knowledge in the principles of safe construction practices
- To understand the need of ethical considerations in construction.

**Syllabus :** Construction Planning and Scheduling, Construction disputes and settlement, Ethics in Construction, Construction safety, Principles of Materials management, Quality management practices, Construction procedures

**Expected Outcomes:**

The students will be able to:

- i. Plan and schedule a construction project.
- ii. Select an appropriate construction equipment for a specific job
- iii. Familiarise the legal procedures in construction contracts
- iv. Formulate suitable quality management plan for construction
- v. Familiarise the safety practices and procedures.
- vi. Apply principles of ethics in decision making.

**Text Books:**

1. Kumar Neeraj Jha, Construction Project Management, Pearson, Dorling Kindersley (India) Pvt. Ltd
2. L.S. Srinath – PERT and CPM –Principles and Applications, Affiliated East-West Press, 2001
3. Peurifoy and Schexnayder – Construction Planning, Equipment, and Methods, Tata McGraw Hill, 2010

**Reference Books**

1. B.C.Punmia & K K Khandelwal, Project Planning with CPM and PERT, Laxmi Publication, New Delhi, 2016
2. Charles D Fledderman, Engineering Ethics, Prentice Hall, 2012
3. [F. Harris](#), Modern Construction and Ground Engineering Equipment and Methods, Prentice Hall, 1994
4. Gahlot and Dhir, Construction Planning and Management, New Age International, 1992
5. K K Chitkara, Construction Project Management, McGraw Hill Education Pvt Ltd., 2000
6. Khanna, O.P., Industrial Engineering and Management., Dhanapat Rai Publications, 1980
7. National Building Code, BIS
8. P.P. Dharwadkar, Management in Construction Industry, Oxford and IBH
9. Shrivastava, Construction Planning and Management, Galgotia Publications, 2000

**COURSE PLAN**

Module	Contents	Hours	Sem. Exam Marks %
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<b>I</b>	Unique features of construction projects ; Identification of components –Principles of preparing DPR- Construction planning and scheduling - I – Bar charts, Network Techniques, Use of CPM and PERT for planning – Drawing network diagrams – time estimates – slack – critical path-Examples	7	15
<b>II</b>	Crashing and time –cost trade off, Resource smoothing and resources levelling - Construction, equipment, material and labour schedules. Preparation of job layout. Codification of the planning system : Codification approach- Work package and activities identification code – Resource codes – Cost and Finance accounting codes – Technical document codes.	7	15
<b>FIRST INTERNAL EXAMINATION</b>			
<b>III</b>	Construction disputes and settlement : Types of disputes – Modes of settlement of disputes – Arbitration- Arbitrator - Advantages and disadvantages of arbitration – Arbitration Award. Construction cost and budget :Construction cost – Classification of construction cost – Unit rate costing of resources- Budget – Types of budget – Project Master budget.	6	15
<b>IV</b>	Concept of ethics – Professional ethics – ethical problems – provisions of a professional code – Role of professional bodies.Project management information system- Concept – Information system computerization – Acquiring a system – Problems in information system management - Benefits of computerized information system.	7	15
<b>SECOND INTERNAL EXAMINATION</b>			
<b>V</b>	Concept of materials management – inventory – inventory control – Economic order quantity- ABC analysis. Safety in construction – Safety measures in different stages of construction – implementation of safety programme.	7	20
<b>VI</b>	Construction procedures: different methods of construction – types of contract – Tenders – prequalification procedure - earnest money deposit – contract document – General and important conditions of contract - measurement and measurement book - Inspection and quality control - need, principles and stages. Basics of Total Quality Management	8	20
<b>END SEMESTER EXAMINATION</b>			

### QUESTION PAPER PATTERN (End semester examination)

**Maximum Marks :100**

**Exam Duration: 3 Hrs**

Part A -Module I & II : 2 questions out of 3 questions carrying 15 marks each

Part B - Module III & IV: 2 questions out of 3 questions carrying 15 marks each

Part C - Module V & VI : 2 questions out of 3 questions carrying 20 marks each

**Note :** 1.Each part should have at least one question from each module

2.Each question can have a maximum of 4 subdivisions (a, b, c, d)



Course code	Course Name	Credits	Year of Introduction						
*492	PROJECT	6	2016						
Prerequisite : Nil									
<b>Course Objectives</b> <ul style="list-style-type: none"><li>To apply engineering knowledge in practical problem solving</li><li>To foster innovation in design of products, processes or systems</li><li>To develop creative thinking in finding viable solutions to engineering problems</li></ul>									
<b>Course Plan</b> <p>In depth study of the topic assigned in the light of the preliminary report prepared in the seventh semester</p> <p>Review and finalization of the approach to the problem relating to the assigned topic</p> <p>Preparing a detailed action plan for conducting the investigation, including team work</p> <p>Detailed Analysis/Modelling/Simulation/Design/Problem Solving/Experiment as needed</p> <p>Final development of product/process, testing, results, conclusions and future directions</p> <p>Preparing a paper for Conference presentation/Publication in Journals, if possible</p> <p>Preparing a report in the standard format for being evaluated by the dept. assessment board</p> <p>Final project presentation and viva voce by the assessment board including external expert</p>									
<b>Expected outcome</b> <p>The students will be able to</p> <ul style="list-style-type: none"><li>iii. Think innovatively on the development of components, products, processes or technologies in the engineering field</li><li>iv. Apply knowledge gained in solving real life engineering problems</li></ul>									
<b>Evaluation</b> <p><b>Maximum Marks : 100</b></p> <table><tr><td>(i) Two progress assessments</td><td>20% by the faculty supervisor(s)</td></tr><tr><td>(ii) Final project report</td><td>30% by the assessment board</td></tr><tr><td>(iii) Project presentation and viva voce</td><td>50% by the assessment board</td></tr></table> <p><i>Note:</i> All the three evaluations are mandatory for course completion and for awarding the final grade.</p>				(i) Two progress assessments	20% by the faculty supervisor(s)	(ii) Final project report	30% by the assessment board	(iii) Project presentation and viva voce	50% by the assessment board
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(ii) Final project report	30% by the assessment board								
(iii) Project presentation and viva voce	50% by the assessment board								

Course Code	Course Name	L-T-P-Credits	Year of Introduction
CE462	TOWN AND COUNTRY PLANNING	3-0-0-3	2016
<b>Prerequisite : Nil</b>			
<b>Course Objective:</b> <ul style="list-style-type: none"> <li>To expose various levels of planning, the elements involved in urban and regional planning and their interrelationships</li> <li>To learn to draw up a town development plan.</li> </ul>			
<b>Syllabus :</b> Goals and objectives of planning; Components of planning - regional planning for block, district, state, nation - Theories of urbanization - Study of Urban Forms - Urban Structure and its Characteristics - Spatial standards for various facility areas and utilities – zoning - Development of new towns - Urban Renewal - Town Development Plan - Techniques of Preparation of Base Maps.			
<b>Course Outcome:</b> The student will be able to <ol style="list-style-type: none"> <li>identify and develop the various components of planning at neighborhood, city, regional and national levels</li> <li>familiarize with spatial standards of facilities and prepare base maps for urban development.</li> </ol>			
<b>Text Books:</b> <ol style="list-style-type: none"> <li>Hutchinson B.G., Principles of Transportation Systems Planning, McGraw-Hill, 1974</li> <li>Khadiyali L.R. Traffic Engineering and Transport planning, Khanna Tech Publishers, 1999</li> <li>Oppenheim N., Applied Models in Urban and Regional Analysis, Prentice-Hall, 1980</li> <li>Rangwala, Town planning , Charotar publishing house, 28e, 2015.</li> </ol>			
<b>References:</b> <ol style="list-style-type: none"> <li>Eisner S, Gallion A and Eisner S., The Urban Pattern, Wiley, 1993.</li> <li>Hiraskar G K, Fundamentals of Town planning, Dhanpat Rai publications, 1993.</li> <li>N.K Gandhi – Study of Town and Country planning in India – Indian Town and Country planning Association, 1973.</li> <li>Wilson, A.G, Urban and Regional Models in Geography and Planning, John Wiley and Sons, 1974.</li> </ol>			
Module	Contents	Hours	Sem. Exam Marks %
I	Definitions and Rationales of Planning - Definitions of town and country planning; Goals and objectives of planning; Components of planning; Benefits of planning - urbanization, industrialization and urban development; push and pull factors; migration trends and impacts on urban and rural development - rural-urban fringes - city region - area of influence and dominance	6	15
II	Rural landscapes- regional planning: definition, need and importance, function, objective, concept of region, types of	6	15

	regions, delineation of regions - Types and contents of regional planning for block, district, state, nation, NCR, resource region, agro-climatic region, topographic region and sectoral planning, major regional problems and their solutions.		
<b>FIRST INTERNAL EXAMINATION</b>			
<b>III</b>	Theories of urbanization-Concentric Zone Theory; Sector Theory; Multiple Nuclei Theory; Land Use and Land Value Theory of William Alonso; City as an organism: a physical entity, social entity and political entity – Study of Urban Forms such as Garden City, Precincts, Neighbourhoods, - MARS Plan, LeCorbusier Concept, Radburn Concept	<b>7</b>	<b>15</b>
<b>IV</b>	Urban Structure and its Characteristics - Functions of Transportation Network - concept of accessibility and mobility, Transit Oriented Development (TOD) - Spatial standards for residential, industrial, commercial and recreational areas, space standards for facility areas and utilities, Provisions of Town Planning Act, zoning, subdivision practice, metro region concept.	<b>7</b>	<b>15</b>
<b>SECOND INTERNAL EXAMINATION</b>			
<b>V</b>	<b>Concept of New Towns:</b> Meaning, role and functions: Special planning and development considerations, scope and limitations of new town development, Indian experience of planning and development of new towns. Urban Renewal: Meaning, significance, scope and limitations, urban renewal as a part of metropolitan plan	<b>8</b>	<b>20</b>
<b>VI</b>	Town Development Plan: Scope, contents and preparation. A case study of development plan, scope, content and preparation of zonal development plans, plan implementation - organizational legal and financial aspects, public participation in plan formulation and implementation - Techniques of Preparation of Base Maps: Drawing size, scale, format, orientation, reduction and enlargement of base maps.	<b>8</b>	<b>20</b>
<b>END SEMESTER EXAMINATION</b>			

### QUESTION PAPER PATTERN (End semester examination)

**Maximum Marks :100**

**Exam Duration: 3 Hrs**

Part A -Module I & II : 2 questions out of 3 questions carrying 15 marks each

Part B - Module III & IV: 2 questions out of 3 questions carrying 15 marks each

Part C - Module V & VI: 2 questions out of 3 questions carrying 20 marks each

**Note :** 1.Each part should have at least one question from each module

2.Each question can have a maximum of 4 subdivisions (a, b, c, d)

Course Code	Course Name	L-T-P-Credits	Year of Introduction
CE472	TRANSPORTATION PLANNING	3-0-0-3	2016
<b>Prerequisite: NIL</b>			
<b>Course Objectives:</b> <ul style="list-style-type: none"> <li>To expose the students to the dynamics of urban travel patterns, land use transport interaction, the steps and techniques involved in transportation planning process.</li> </ul>			
<b>Syllabus:</b> Transportation planning process – Transportation Systems - Urban Travel Patterns and Urban Transportation Technologies - Urban Activity System - Four Step Planning process - Land use transport models.			
<b>Course Outcome:</b> The student will be able to calibrate and validate planning models, evaluate various transportation planning alternatives.			
<b>Text Books:</b> <ol style="list-style-type: none"> <li>Bruton, M. J., Introduction to Transportation Planning, Hutchinson of London</li> <li>Dickey, J. W. Metropolitan Transportation Planning, Tata McGraw Hill</li> <li>Papacostas, C. S. and Prevedouros, P.D., Transportation Engineering and Planning, Prentice Hall.</li> </ol>			
<b>References:</b> <ol style="list-style-type: none"> <li>Gallion, A.B. and Eisner, S., The Urban Pattern, East-West Press, New Delhi.</li> <li>Hutchinson, B.G., Principles of Urban Transportation System Planning, McGraw Hill</li> <li>Mayer, M.D and Miller, E .J, Urban Transportation Planning a Decision Oriented Approach, McGraw Hill.</li> </ol>			

Module	Contents	Hours	End Sem. Exam Marks %
I	Introduction: Role of transportation in the development of a society - Land use-Transportation interaction - Goal, objectives and constraints in transportation planning process – Transportation Systems overview - Transportation issues and challenges – Basic steps in systems planning process	6	15
II	Different modes of transport - Characteristics of different modes - integration of modes and interactions - impact on environment - Relationship between Movement and Accessibility – Hierarchy of transportation facilities - Brief Study of Urban Travel Patterns and Urban Transportation Technologies - Comprehensive Mobility Plan	7	15
<b>FIRST INTERNAL EXAMINATION</b>			
III	Urban Transportation Planning: Urban Activity System - Trip-based and Activity-based approaches - inventory, model building, forecasting and evaluation stages – Definition of study area – zoning - Urban Structure and its Characteristics	6	15



IV	Four Step Planning process – Trip generation – trip production and trip attraction models – regression and category analysis - Trip Distribution-Growth factor models, Gravity models - mode split models	8	15
<b>SECOND INTERNAL EXAMINATION</b>			
V	Route choice modeling - diversion curves - basic elements of transportation networks, coding, minimum path trees - traffic assignment - all- or- nothing assignments, capacity restraint techniques	8	20
VI	Land use transport models - Lowry derivative models - Quick response techniques - Non-Transport solutions for transport problems.	7	20
<b>END SEMESTER EXAMINATION</b>			

### QUESTION PAPER PATTERN (End semester exam)

**Maximum Marks :100**

**Exam Duration: 3 Hrs**

Part A -Module I & II : 2 questions out of 3 questions carrying 15 marks each  
Part B - Module III & IV: 2 questions out of 3 questions carrying 15 marks each  
Part C - Module V & VI: 2 questions out of 3 questions carrying 20 marks each

**Note :** 1.Each part should have at least one question from each module  
2.Each question can have a maximum of 4 subdivisions (a,b,c,d)