Civil Engg. Department

Semester : 5

Teaching Scheme

Course Code	Course Name	Lecture hours	Tutorial hours	Practical hours	Credit
CE 3001	Matrix Analysis of Structures	1	1	0	2
CE 3002	Soil Mechanics	3	1	2	5
CE 3006	Design of R.C.C. Structures	3	2	0	4
CE 3004	Environmental Engineering	3	0	2	5
CE 3003	Hydrology and Hydraulic Structures	3	1	0	4
CE 3005	Transportation Engineering	3	1	0	4
	Total	**15**	**5**	**7**	**25**

I	Course Code	**CE 3001**			
II	Course Title	**Matrix Analysis of Structures**			
III	Credit Structure	L	P	T	C
		1	0	1	2
IV	Prerequisite(If any for the student)	Nil			
V	Course Content	Static and Kinematic indeterminacy of structures - Flexibility method of analysis Stiffness method of analysis Computer oriented direct stiffness method (member approach) for beam, plane truss, plane frame Analysis of structures using structural analysis and design software.			
VI	Text/References	1. Matrix Analysis of Framed Structures by Gere & Weaver (CBS Publications) 2. Matrix Analysis of Structures by P K singh (Cengage Learning)			

<table>
<tr><td>I</td><td>Course Code</td><td colspan="4">CE 3002</td></tr>
<tr><td>II</td><td>Course Title</td><td colspan="4">Soil Mechanics</td></tr>
<tr><td rowspan="2">III</td><td rowspan="2">Credit Structure</td><td>L</td><td>P</td><td>T</td><td>C</td></tr>
<tr><td>3</td><td>2</td><td>1</td><td>5</td></tr>
<tr><td>IV</td><td>Prerequisite(If any for the student)</td><td colspan="4">Nil</td></tr>
<tr><td>V</td><td>Course Content</td><td colspan="4">Origin of soil; Phase relationships; Identification and classification of soils; Effective stress principle; Permeability of soils; Seepage and flownets; Compaction of soils; Compressibility of soils; Terzaghis one-dimensional consolidation theory; Shear strength of soils; Mohr-coulomb failure criteria; Total and effective stress paths; Effective stress and total stress strength parameters; Shear strength testing.
Laboratory Experiments:
1. Visual classification of soil, sieve analysis and hydrometer analysis
2. Determination of dry density of soil by core cutter method
3. Determination of dry density of soil by sand replacement method
4. Determination of specific gravity of soil by pycnometer
5. Determination of Atterberghs limits, i.e. liquid limit, plastic limit and shrinkage limit of soil
6. Constant head and falling head permeability test
7. Standard and modified Proctors compaction test
8. Consolidation test
9. Direct shear test
10. Vane shear test
11. Unconfined compression (UC) test.</td></tr>
<tr><td>VI</td><td>Text/References</td><td colspan="4">1. Soil Mechanics in Engineering Practice by Karl Terzaghi (Wiley India)
2. Textbook of Geotechnical Engineering by B M Das (Cengage Learning)
3. Basic and Applied Soil Mechanics by G Ranjan and A S R Rao (New Age International)
4. Geotechnical Engineering: principles and Practices by D P Koduto (Prentice Hall of India Pvt. Ltd.)
5. Geotechnical Engineering: A Practical Problem Solving Approach by N Sivakugan and B M Das (Cengage Learning)</td></tr>
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<tr><td>I</td><td>Course Code</td><td colspan="4">CE 3006</td></tr>
<tr><td>II</td><td>Course Title</td><td colspan="4">Design of R.C.C. Structures</td></tr>
<tr><td rowspan="2">III</td><td rowspan="2">Credit Structure</td><td>L</td><td>P</td><td>T</td><td>C</td></tr>
<tr><td>3</td><td>0</td><td>2</td><td>4</td></tr>
<tr><td>IV</td><td>Prerequisite(If any for the student)</td><td colspan="4">Nil</td></tr>
<tr><td>V</td><td>Course Content</td><td colspan="4">Introduction to Structural Systems, Materials, Loadings and Structural Analysis, Introduction to Design of Concrete Structures, Working Stress Design, Ultimate Load Design, Limit Sate Design - Limit State Method of Design for flexure, shear, compression and torsion, bond and development length -Design of singly reinforced beam, doubly reinforced beam, T beam Design of one way slab, two way slab, continuous slab, flat slabs Design of axially and eccentrically loaded columns Beam-Columns - Design of staircases, footings - Ductile Detailing of R.C.C. structures</td></tr>
<tr><td>VI</td><td>Text/References</td><td colspan="4">1. Reinforced Concrete Design by S. N. Sinha (Tata McGraw Hill)
2. Limit State Theory and Design of Reinforced Concrete (As per IS 456-2000) by V.L.Shah and S R Karve (Structures Publications)
3. Reinforced Concrete (Limit state Design) by Jain (Nemchand Publications)
4. IS 456 2000 (Bureau of Indian Standards)
5. IS 13920 1993 (Bureau of Indian Standards)</td></tr>
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<tr><td>I</td><td>Course Code</td><td colspan="4">CE 3004</td></tr>
<tr><td>II</td><td>Course Title</td><td colspan="4">Environmental Engineering</td></tr>
<tr><td rowspan="2">III</td><td rowspan="2">Credit Structure</td><td>L</td><td>P</td><td>T</td><td>C</td></tr>
<tr><td>3</td><td>2</td><td>0</td><td>5</td></tr>
<tr><td>IV</td><td>Prerequisite(If any for the student)</td><td colspan="4">Nil</td></tr>
<tr><td>V</td><td>Course Content</td><td colspan="4">Water treatment: Sources of water, Quality and quantity of water, Water-borne diseases, Drinking water standards, water requirements, water chemisty, basic unit operations and unit processes for water treatment, distribution of water.
Wastewater treatment: Sources of water pollution and their characteristics, Quantity and characteristics of wastewater. Primary, secondary and tertiary treatment of wastewater, sludge disposal, effluent discharge standards.
Air Pollution: Types of pollutants, their sources and impacts, Air quality standards, air pollution meteorology, air pollution control methods.
Municipal Solid Wastes: Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management
Noise Pollution: Impacts of noise, permissible limits of noise pollution, measurement of noise and control of noise pollution.
Laboratory Experiments:
1. Preliminary Examination for water for taste, odour and colour
2. Examination of water for pH, turbidity, conductivity
3. Examination of water for alkalinity
4. Determination of sulfates- gravimetric and turbidimetric method
5. Determination of total solids (TS), total suspended solids (TSS) and total dissolved solids (TDS) in a water sample.
6. Determination of BOD
7. Determination of COD
8. Optimum coagulant dosage
9. Determination of free and residual chlorine in water
10. Examination of water for Ammonical nitrogen and total Kjeldahl nitrogen
11. Microbiological testing of water
12. Determination of fluorides in water
13. Determination of noise level in traffic junctions
14. Demonstration of TOC and IC analysers for water and ambient aerosol samples
15. Demonstration of ambient air analysis using GC
16. Demonstration of Automatic Weather station (AWS).
17. Field visit for stack monitoring</td></tr>
<tr><td>VI</td><td>Text/References</td><td colspan="4">1. Introduction of Environmental Engineering by Mackenzie L Davis and David A Cornwell (Tata McGraw-Hill)</td></tr>
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<tr><td>I</td><td>Course Code</td><td colspan="4">CE 3003</td></tr>
<tr><td>II</td><td>Course Title</td><td colspan="4">Hydrology and Hydraulic Structures</td></tr>
<tr><td rowspan="2">III</td><td rowspan="2">Credit Structure</td><td>L</td><td>P</td><td>T</td><td>C</td></tr>
<tr><td>3</td><td>0</td><td>1</td><td>4</td></tr>
<tr><td>IV</td><td>Prerequisite(If any for the student)</td><td colspan="4">Nil</td></tr>
<tr><td>V</td><td>Course Content</td><td colspan="4">Part-I Hydrology: Introduction, Precipitation, Stream flow measurements, Hydrographs, Flood, Flood Routing.
Part-II Hydraulic Structures: Introduction, Reservoirs and planning for dam reservoirs, Design and construction of Gravity Dams, Earthen dams and Rock fill dams, Spillways, Energy dissipator and Spillway gates, Arch and buttress dams, River training works.</td></tr>
<tr><td>VI</td><td>Text/References</td><td colspan="4">1. Engineering Hydrology by K Subramanya.
2. Applied Hydrology by VenTe Chow.
3. Elementary Hydrology by V. P. Singh.
4. Irrigation Engineering and Hydraulic Structures by S K Garg.
5. Hydraulic Structures by P. Novak, A.I.B. Moffat, C. Nalluri, R. Narayanan.
6. River Behavior Management and Training, Vol. I and Vol. II, Central Board of Irrigation and Power (CBIP).</td></tr>
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I	Course Code	**CE 3005**			
II	Course Title	**Transportation Engineering**			
III	Credit Structure	L	P	T	C
		3	0	1	4
IV	Prerequisite(If any for the student)	Nil			
V	Course Content	Transportation Systems and their classification, Role of roads, road transport and planning in India, Driver and vehicle characteristics, Pavement materials and characterization; Highway Planning: Geometric design of highways, testing and specifications of paving materials, design of flexible and rigid pavements. Traffic Engineering: Traffic Characteristics, Fundamental relationships, theories of traffic flow, shock waves, intersection design and traffic signs and signals - design, Highway Capacity. Terminology used in railways, Track design, Points and crossings, Signalling and Interlocking, Capacity of Railway transit systems.			
VI	Text/References	1. P. Chakroborty and A. Das, Principles of Transportation Engineering, Prentice Hall India, 2003. 2. S. C. Saxena and S.P. Arora, A text book of Railway engineering, Dhanpat Rai, 2001.			