

## SEMESTER - VIII

Option	Course No.	Course Title	Theory	
			Contact Hours/ Week	Credit
1	CE 401	Project Planning & Construction Management	3.0	3.00
2	CE 413	Pre-stressed Concrete	2.0	2.00
	CE 415	Theory of Elasticity and Elastic Instability of Structures	2.0	2.00
	CE 417	Finite Element Method	2.0	2.00
	CE 419	Structural Dynamics	2.0	2.00
	CE 461	Design of Steel Structures	2.0	2.00
	CE 410	Structural Analysis and Design Sessional -III	3.0	1.5
	CE 412	Structural Analysis & Design Sessional-IV	3.0	1.5
3	CE 420	Water Resources Engineering Sessional-I	3.0	1.50
	CE 423	River Engineering	2.0	2.00
	CE 425	Coastal Engineering	2.0	2.00
	CE 427	Hydraulic Structures	2.0	2.00
	CE 429	Ground Water Engineering	2.0	2.00
4	CE 430	Geotechnical Engineering Sessional-III	3.0	1.5
	CE 433	Geotechnical Engineering-IV	2.0	2.00
	CE 435	Geotechnical Engineering-V	2.0	2.00
	CE 437	Geotechnical Engineering-VI	2.0	2.00
5	CE 440	Environmental Engineering Sessional-III	3.0	1.5
	CE 443	Environmental Pollution Control	2.0	2.00
	CE 445	Solid Waste Management	2.0	2.00
	CE 447	Environmental Development Project	2.0	2.00
6	CE 450	Transportation Engineering Sessional-III	3.0	1.5
	CE 453	Transportation Engineering-III	2.0	2.00
	CE 455	Transportation Engineering-IV	2.0	2.00
	CE 457	Transportation Engineering-V	2.0	2.00
7	CE 403	Professional Practices & Communication Skills	2.0	2.00
	CE 405	Socio-Economic Aspects of Development Project	2.0	2.00
8	CE 400	Project & Thesis	6.0	3.0

**N.B.** 1 & 8-Compulsory course, (2-7) - Optional course. Students shall take one optional thesis related theory course & the corresponding sessional course from any optional group of 2-6 and three more optional theory courses from other options of 2-7 but not more than one from each option & another corresponding sessional course.

No. of Theory Courses = 05

Total Contact Hour = 32

No. of Sessional Courses = 06

Total Credit = 21.5

## SEMESTER - VIII

### CE 401      Project Planning & Construction Management

**Lecture:**      3 hrs/ week

**Credit:** 3.00

Principles of Management, Principles of construction management, construction contracts and specifications, inspection and quality control, construction safety, construction planning and scheduling, PERT, CPM, case studies, resource scheduling, PERT: a cost accounting system, linear programming, decision making and simulation, psychology in administration, materials management, demand forecasting, inventory control, personnel management, stores management, procurement, project planning and evaluation, feasibility reports, cash flow, pay back period, internal rate of return, benefit-cost ratio, construction equipment and plants, replacement studies.

### CE 403      Professional Practices and Communication Skills

**Lecture:**      2 hrs/ week

**Credit:** 2.00

The project cycle, project proposal, contractual provisions, techniques of specification writing, evaluation of bids, project evaluation.

Interpretation of literature, documents etc., communicating, preparation of report, industrial and labour relations, professional ethics in Civil Engineering.

### CE 405      Socio-Economic Aspects of Development Projects

**Lecture:**      2 hrs/ week

**Credit:** 2.00

Economic and social structure, development and economic growth, socio-economic indicators, population, prosperity and poverty, employment of work force, population displacement, rehabilitation strategy, productivity, land loss, land use and land ownership patterns, fisheries and aqua culture, deforestation and afforestation, communication, commerce, industries and

other economic benefits, water supply, sanitation, health and nutrition, inequalities in distribution of benefits and losses, socio-economic survey, case studies.

*CE 407 Integrated Water Resources Planning and Management*

**Lecture:** 2 hrs/ week

**Credit: 2.00**

Basic concepts in integrated water resources management. Economic, environmental and industrial aspects. Participation of beneficiaries. Formation of users group. Fisheries management. Strategic planning. System analysis approach: Conceptual framework and models. Analytical techniques.

*CE 410 Structural Analysis and Design Sessional-III*

**Lecture:** 3 hrs/ week

**Credit: 1.50**

Introduction to tall buildings in different countries of the world, design of high rise compression members by WSD and USD methods. Design of beam, beam-columns and joint.

*CE 412 Structural Analysis and Design Sessional-IV*

**Sessional:** 3 hrs/ week

**Credit: 1.50**

Design of various reinforced concrete structures e.g. water tower, folded plate roof etc.

*CE 413 Prestressed Concrete*

**Lecture:** 2 hrs/ week

**Credit: 2.00**

Prestressed concrete: materials, prestressing systems, loss of prestress, analysis of sections for flexure, shear, bond and bearing, beam deflections and cable layout, partial prestress, design of prestressed sections for flexure, shear, bond and bearing. Analysis and design of prestressed beam section.

**CE 415**      **Theory of Elasticity and Elastic Instability of Structures**

**Lecture:**      **2 hrs/ week**  
**Credit: 2.00**

Introduction to theory of elasticity, plane stress and plane strain condition, two dimensional problems in rectangular and polar coordinates, torsion of circular and non-circular shafts, instability of structures, stability functions.

**CE 417**      **Finite Element Method**

**Lecture:**      **2 hrs/ week**  
**Credit: 2.00**

Introduction to finite element method as applied to Civil Engineering problems. One dimensional stress deformation and time dependent flow problem. Analysis of two dimensional plane stress and plane strain problems.

**CE 419**      **Structural Dynamics**

**Lecture:**      **2 hrs/ week**  
**Credit: 2.00**

Formulation of equation of motion, free vibration response, SDOF and MDOF systems, response to harmonic and impulse loading and vibration analysis by Rayleigh's method.

**CE 420**      **Water Resources Engineering Sessional-I**

**Sessional:**      **3 hrs/ week**  
**Credit: 1.50**

Design of hydraulic structures, river training works. Groundwater resource assessment and water well design.

**CE 423**      **River Engineering**

**Lecture:**      **2 hrs/ week**  
**Credit: 2.00**

Behavior of alluvial rivers. River channel pattern and fluvial processes. Aggradation and degradation, local scours, river training and bank protection works. Navigation and dredging. Sediment movement in river channels, bed forms and flow regimes.

**CE 425**      **Coastal Engineering**

**Lecture:**      **2 hrs/ week**  
**Credit: 2.00**

Coast and coastal features. Tides and currents. Tidal flow measurement. Waves and storm surges. Docks and labor. Forces of waves and fides in the design of coastal and harbor structures.

Coastal sedimentation processes. Deltas and estuaries. Shore protection works. Dredging and dredgers.

### CE 427            Hydraulic Structures

**Lecture:**            2 hrs/ week

**Credit: 2.00**

Principles of design of hydraulic structures, types of hydraulic structures. Design of dams, barrages, weirs, spillways, energy dissipaters and spillway gates. Cross drainage works.

### CE 429            Ground Water Engineering

**Lecture:**            2 hrs/ week

**Credit: 2.00**

Groundwater in hydrologic cycle and its occurrence. Physical properties and principles of groundwater movement. Groundwater and well hydraulics. Groundwater resource evaluation. Groundwater levels and environmental influences. Water pollution and contaminant transport. Recharge of groundwater. Saline water intrusion in aquifer. Groundwater management.

### CE 430            Geotechnical Engineering Sessional-III

**Sessional:**        3 hrs/ week

**Credit: 1.50**

Interpretation of soil test results and design of foundation.

### *CE 433 Geotechnical Engineering-IV*

**Lecture:**            2 hrs/ week

**Credit: 2.00**

**Prereq. CE 333**

Foundation for structures subjected to lateral loads, retaining walls and abutments, operation and methods of construction, de-watering and slurry-wall construction. Flexible earth retaining structures, sheet piles, cofferdams, caissons, machine foundations, elementary vibrations, shear modulus and elastic constants, foundation design for vibration, fundamentals of soil liquefaction.

### CE 435            Geotechnical Engineering-V

**Lecture:**            2 hrs/ week

**Credit: 2.00**

Introduction to critical state soil mechanics, SHANSEP and stress path methods, stress deformation and failure of soil masses. One, two and three dimensional consolidation problem, pore pressure coefficients, soil structure-interaction, earthquake and liquefaction problems, soil improvement, numerical solution of Geotechnical Engineering problems.

### CE 437            Geotechnical Engineering-VI

**Lecture:**            2 hrs/ week

**Credit: 2.00**

Introduction to soil-water interaction problems. Permeability, capillarity and soil suction. Seepage analysis, stability of natural, man made slope, and excavation subjected to seepage, water current, wave action etc. Theories of filters and revetment design, hydraulic fills.

### CE 440            Environmental Engineering Sessional-III

**Sessional:**        3 hrs/ week

**Credit: 1.50**

Design of sewerage systems, field visits/ assignments on existing water supply and sanitation technologies, case study on user's participation, O & M practices and ownership, community managed projects.

**CE 443**      **Environmental Pollution Control**

**Lecture:**      **2 hrs/ week**

**Credit: 2.00**

Environment Pollution and its control: Water pollution-source and types of pollutants, waste assimilation capacity of streams, dissolved oxygen modeling, ecological balance of streams, industrial pollution, heavy metal contamination, detergent pollution and eutrophication, ground water pollution, marine pollution control measures-water quality monitoring and management.

Air pollution: Sources and type of pollutants, effects of various pollutants on human health, material and plants, air pollution meteorology, global warming and greenhouse effects, air pollution monitoring and control measures, noise pollution and its effects, ozone layer depletion and acid rain.

**CE 445**      **Solid Waste Management**

**Lecture:**      **2 hrs/ week**

**Credit: 2.00**

Sources and types of solid wastes, physical and chemical properties of solid wastes, solid wastes generation, on -site handling, storage and processing, collection of solid wastes, community and municipal collection systems, transfer station and transport, ultimate disposal methods, recycling and resources recovery, soil pollution, industrial solid waste collection and disposal, hazardous waste management.

**CE 447** *Environmental Development Project*

**Lecture:**      **2 hrs/ week**

**Credit: 2.00**

Environment and sustainable development, environmental policies and legislation, environmental implication of sectoral development, environmental quality standards, environmental issues and priorities, environmental impact assessment of development schemes, baseline studies, assessment methodologies, economics of environmental management, special topics.

**CE 450**      **Transportation Engineering Sessional-III**

**Sessional:**      **3 hrs/ week**

**Credit: 1.50**

**Prereq. CE 451**

Design of flexible and rigid highway and air field pavements, geometric design: Roadway intersections, capacity calculation, traffic studies and design.

**CE 451**      **Transportation Engineering-III**

**Lecture:**      **2 hrs/ week**

**Credit: 2.00**

**Prereq. CE 351**

The transportation planning process, traffic management concepts, traffic accident investigations, city road and street networks, grade separation and interchanges, pedestrian and bicycle facilities. The urban bypass, environmental aspects of highway traffic and transportation projects, elements of traffic flow.

**CE 453**      **Transportation Engineering-IV**

**Lecture:**      **2 hrs/ week**

**Credit: 2.00**

Highways drainage and drainage structures. Evaluation and strengthening of pavements, importance, advantages and trends in air transportation, planning and design of airports, aircraft characteristics related to airport design, types and elements of airport planning studies, airport configuration, geometric design of the landing area, terminal area, heliports, design of airport pavements, lighting, marking and signing, airport drainage.

**CE 455**      **Transportation Engineering-V**

**Lecture:**      **2 hrs/ week**

**Credit: 2.00**

Highway needs study, highway planning, economics and financing, evaluation and analysis of transportation projects, management, monitoring, organization and implementation of transportation projects, selected case studies, traffic engineering administration and legislation, urban public transportation and freight movement.

**CE 461**      **Design of Steel Structures**

**Sessional:**      **2 hrs/ week**

**Credit: 2.00**

Behavior of structural steel members and steel frames, code requirements, design of tension and compression members by WSD and USD methods, design of beam. Beam-columns, joint design.