

Detailed Contents of Courses for the M.Engg Programme in Civil Engineering

Coastal and Water Resources Engineering

Common Compulsory Courses and Common Elective Courses

CE-518 Mathematical Methods for Engineers

Ordinary Differential Equations: Bessel's equation, Legendre's equation, Hermite equations, Laguerre's equation, Sturm-liouville problem, Eigen function and Eigen values, Ordinary differential equation from a geometric point of view, Involving significant use of phaseplane diagrams and associated concepts, Including equilibrium points, Orbits, limit cycles and domain of attraction, Simple application. Partial Differential Equation: Partial differential equation (vibrating string problem), Classification of partial differential equation, Partial differential equation with constant coefficients, Method of separation of variables, D'Alembert's method, General solution of wave equation, Initial value problem in general, Partial differential equation with variable coefficients, Solution of linear hyperbolic equation, Vibrating modes of a finite string, Simple application.

CE-521 Introduction to Ocean and Coastal Engineering

Incompressible fluid mechanics and applications to analysis of wave motions, circulation, and other free surface flows in coastal and offshore regions; wave spectra, water-level fluctuations, tides, tsunamis, oscillations, and storm surges; wind-generated waves, beaches, sediment transport, wave forces on coastal and offshore structures. Introduction to state-of-the-art Instrumentation with reference to measuring various aspects of Oceanic parameters.

CE-580 Applied Hydrology

Hydrologic Components: Hydrologic Cycle, Intensity-Duration-Frequency curve, Stream flow, Unit and Synthetic Hydrograph Analysis. Stream Gauging: Methods of Measuring Stream Flow; Stage-Discharge-Rating Curve, Storage. Statistical Analysis: Probability Analysis, Recurrence Interval, Annual Maxima using Hydrological Data. Sediment Transport: Weathering, Erosion and Sediment Processes, Factors Affecting Erosion, Sediment Yield e.g., RUSLE, Sediment Transport processes, Erosion and Pollution, Reservoir Sedimentation: Reduction in Reservoir Capacity, Reservoir Sedimentation Control. Probability concept, Flow Duration Curve, Risk and Reliability. Application of Hydrologic Models. Water Quality: background, Important Concepts, Best Management Practices, Biological Impaired Water

EN-517 Water Supply and Sewer System Design

Design of Water Supply System, Storm Drains, Sanitary Sewers, Pumping Stations, HSR and Hydro-pneumatic System.

EN-520 Marine Pollution and Control

Effects of Pollution Discharges, Oil Spills, Coast Development, Beach Erosion, Channel Dredging and Changing Sea-Level on Marine Environment and Control Measures, Modeling for Pollution Dispersion, Study of Marine Biology (Organism, Fisheries and Mangroves), Coastal Geology and Estuarial Ecology. Marine Resources Management.