

Program: M.Tech (SE)

Course Code	Course Name	Description of Course Outcome
18 CE 5101	Applied Mathematics	Understand the Laplace Transformations and Fourier Transformations concept
		Understand the Elliptic Equation concept for both Laplace Transformations and Fourier Transformations
		Understand the concept of Calculus of Variations
		Understand the concept of Eigen value problems and numerical integration
18CE 5102	Theory of Elasticity	Analysis of Two-dimensional problems in rectangular coordinates
		Analysis of Two-dimensional problems in polar coordinates
		Understand the energy principles
		Understand and analyse the torsion related problems
18 CE 51A2	Design of Offshore Structures	Understand the Wave Theories and Forces on Offshore Structures
		Understand the Offshore Soil and Structure Modelling
		Analysis of Offshore Structures
		Design of Offshore Structures
18 CE 51B2	Stability of Structures	Introduction to buckling of columns
		Analysis of lateral buckling of beams
		Analysis of lateral buckling of plates and shells
		Understanding the Mathematical treatment of stability problems
18 CE 5103	Structural Dynamics	Solve response of free and forced vibrations
		Solve response to Arbitrary, Step and Pulse Excitations (SDOF)
		Solve Earthquake Response of Linear Systems (SDOF)
		Build Generalized Single Degree of Freedom Systems
		Solve response of Multi -degree of freedom systems (MDOF)
18 CE 5104	Advanced Prestressed Concrete	Understand the concepts of prestressed concrete and analyze the prestressed concrete beams.
		Analyze losses in prestressed concrete and deflection of the prestressed concrete members
		Design reinforcement for Ultimate shear, torsion and bending of prestressed concrete members.
		Design end blocks as per IS 1343 recommendations.
		Design of prestressed members, composite sections, continuous prestressed beams
18 CE 5205	Finite Element Analysis	Understand the Basic Finite Element Concepts
		Analysis of Trusses, Beam Bending, Structural Frames and Column buckling using Finite Element Methods
		Analysis of Higher order elements for one dimensional problems and Isometric quadrilateral elements and triangular elements
		Analyse the applications based on general two-dimensional boundary value problem
		Demonstrate the ANSYS software to develop the models using Finite element method
18 CE 5206	Bridge Engineering	Introduction to different types of bridges and codal provisions for designing the bridge components.
		Analysis and Design of slab Culvert.
		Analysis and Design of T-Beam, sub-structure components and bearings
		Understanding the designing of cable supported bridges.
18 CE 5207	Earthquake Resistant Design of Structures	Understanding the designing of cable supported bridges.
		Understand the system of base isolation in structures for resistance towards earthquakes and general detailing requirements of ductile structure.
		Analyze a structure for earthquake forces onto the structure under static and dynamic behavior.
		Design the structure for earthquake forces on 2 -storey building
18 CE 5208	Theory of Plates and Shells	Derive the pure bending and curvature of plates
		Derive the differential equation for laterally loaded rectangular plates
		Derive the deformation of shells without bending
		Understand the general theory of Cylindrical shells
18 CE 51A1	Repair and Rehabilitation of structures	Understand the concept of Deterioration of structures with aging, Need for rehabilitation
		Understand the damage level of structures affected due to seismic loads, Damage assessment and evaluation models
		Understand procedure of rehabilitation methods like Grouting; Detailing; Imbalance of structural stability
		Understand the retrofitting methodology and procedure
18 CE 51B1	Geotechnical Earthquake Engineering	Knowledge of the seismic phenomenon, its occurrence, tectonic theories, seismic waves and their motion in different media and measurement of ground motions. Analysis skills of 1-D ground responses using linear and non-linear approaches
		Ability to analyze the seismic hazard through deterministic and probabilistic approaches. Ability of modifying the actual ground motion records and their time and frequency domain generation.
		Knowledge of dynamic soil properties and their measurements using field and laboratory tests.
		Knowledge of the liquefaction phenomenon and its effects and the remedial measures to be taken for soil improvement.
18 CE 52C1	Industrial Structures	Understand the Planning and Functional Requirements of Industrial Building
		Analysis and Design of different type of Industrial Buildings
		Design of Power plant and transmission Structures
		Design of Auxiliary Structures

18 CE 52C2	Design of Tall Structures	Understanding the design criteria of Tall structures
		Understanding the Loadings On Tall Structures
		Understanding the behaviour of Rigid-Frame Structures and Shear Wall Structures
		Understanding the behaviour of Tubular Structures
		Dynamic analysis on Tall structures
18 CE 52C3	Optimization of Structures	Understanding the Basics of engineering analysis and design
		Understanding the optimization methods
		Introduction to variational methods of sensitivity analysis, shape sensitivity
		Introduction to genetic algorithm and simulated annealing
18 CE 52D1	Advanced Design of structures	Analysis and design of portal frames, Design example for hinged and fixed frame and Design of Reinforced concrete deep beams
		Design of Elevated water tanks; Earthquake resistant design
		Introduction to plastic analysis
18 CE 52D2	Fracture Mechanics	Understanding the basic concepts of Fracture and Linear Elastic Fracture Mechanics (LEFM)
		Understanding the concept of Crack Tip Plasticity
		Understanding the concept Elastic Plastic Fracture Mechanics (EPFM)
		Understanding the concept of Fatigue Crack Growth and practical problems of fracture mechanics
18 CE 52D3	Green Buildings	Understanding the concept of green buildings and practices
		Understanding the Green Building Opportunities and Benefits and Green Building Design
		Understanding the concept of optimal air conditioning
		Understanding the concept of Material Conservation and Indoor Environment Quality and Occupational Health: