COURSE OUTCOMES STRUCTURAL ENGINEERING

SUBJECT CODE SUBJECT NAME	CO	COUSE OUTCOMES
19CESE1001 **ADVANCED STRUCTURAL ANALYSIS**	CO1	Apply energy principles for the analysis of determinate/indeterminate structures.
	CO2	Analyze structures comprising axial elements, Beams, Grids, Plane and space frames using matrix methods.
	CO3	Analyse continuous beams and grids by flexibility and stiffness matrix methods.
	CO4	Apply matrix methods for elastic instability and second order effects including plane frames and space frames.
19CESE 1002 **THEORY OF PLATES AND SHELLS**	CO1	identify the concept of thin plates using various approaches.
	CO2	analyze the thin plates subjected to different loading and boundary conditions.
	CO3	discuss the behavior of shells and their classifications and stress-strain and force-displacement relationship.
	CO4	analyze different types of shells subjected to different loading criterion and boundary conditions
19CESE1003 ---- ADVANCED STEEL DESIGN	CO1	:analyse wind loads on buildings and pitched roof trusses
	CO2	analyze and design tower structures.
	CO3	analyze and design various connections

	CO4	analyze and design truss bridges
19CESE1014/1 ---- Structural Health Monitoring	CO1	acquire fundamentals of structural health monitoring
	CO2	assess the health of structure by using Vibration techniques
	CO3	design considerations for structural health monitoring of bridges.
	CO4	applyrepairs and rehabilitation measures of the structure
19CESE1014/2 ---- SUB-STRUCTURE DESIGN	CO1	plan soil investigation and calculate the stresses on soil due to applied loads
	CO2	calculate bearing capacity of soil to design shallow foundations & calculate the settlements in soils
	CO3	design pile foundations for structures
	CO4	design well foundations
19CESE1014/3 ---- ANALYTICAL AND NUMERICAL METHODS FOR STRUCTURAL ENGINEERING	CO1	solve one dimensional wave equation and one dimensional heat conduction problems.
	CO2	explain functional dependency and solve Laplace and Euler's equations.
	CO3	apply separable kernel iterative method to solve integral equations of second kind
	CO4	estimate functional relationship between variables and parameters.
19CESE1014/4 ---- PRE ENGINEERED BUILDINGS	CO1	classify different materials used for pre-engineered buildings
	CO2	classify pre-engineered building components

	CO3	classify different design loads on pre-engineered buildings
	CO4	apply pre-engineered building design methodology
19CESE1015/1 ---- PREFABRICATED STRUCTURES	CO1	identify design principles and IS code specifications.
	CO2	analyze and design shear walls.
	CO3	analyze and design different types of floors and roof slabs.
	CO4	design industrial buildings.
19CESE1015/2 FRACTURE MECHANICS OF CONCRETE STRUCTURES	CO1	Apply the principles of linear elastic fracture mechanics
	CO2	Apply theprinciples of non-linear fracture mechanics
	CO3	Evaluate the fracture process of concrete
	CO4	Apply the fracture mechanics to concrete structures
19CESE1015/3 STRUCTURAL OPTIMIZATION	CO1	classify optimization and various techniques
	CO2	solve various linear and Non-linear problems
	CO3	solve a problem by geometric programming and dynamic programming
	CO4	apply optimization to various structural elements.
19CESE1015/4 DESIGN OF PRESTRESSED CONCRETE STRUCTURES	CO1	Analyse and design statically determinate and statically indeterminate members
	CO2	Analyze and design the cylinder and non cylinder pipes and tanks
	CO3	Analyze and design the prestressed concrete slabs
	CO4	Analyse and design piles, sleepers, and shell roofs

19 CESE 1026 **RESEARCH METHODOLOGY AND IPR**	CO1	Acquire an overview of the research methodology and techniques to define research problem
	CO2	Review the literature and identify the problem
	CO3	Analyze the optimum sampling techniques for collected data
	CO4	Apply various forms of the intellectual properties for research work
19CESE1051 ADVANCED CONCRETE LAB	CO1	distinguish the effect of water cement ratio on strength of concrete
	CO2	distinguish the effect of aggregate cement ratio
	CO3	determine the properties of fresh and hardened concrete.
	CO4	design the concrete mix for various grades by using Indian and ACI Code
19CESE1052 – Numerical Analysis Lab	CO1	find root of algebraic and transcendental equations
	CO2	fit a curve for given data
	CO3	solve system of linear equations numerically
	CO4	evaluate numerical solution to ordinary differential equation.
19CESE2001 FEM IN STRUCTURAL ENGINEERING	CO1	interpret the concepts behind formulation methods in FEM
	CO2	identify the application and characteristics of FEA elements such as bars, beams, plane and iso-parametric elements
	CO3	develop element characteristic equation and generation

		of global equation
	CO4	apply suitable boundary conditions to a global equation for bars, trusses beam and axisymmetric and elements and solve them displacements, stress and strains induced
19CESE 2002 STABILITY OF STRUCTURES	CO1	analyze the buckling of columns, beam-columns and find critical loads using energy and non-energy methods
	CO2	analyze the lateral buckling of beams by energy and non-energy methods
	CO3	analyze the buckling of rectangular plates and find critical compressive loads for various boundary conditions
	CO4	analyze the buckling of axially loaded cylindrical shells
19CESE 2003 STRCUTURAL DYNAMICS	CO1	classify the principles of structural dynamics.
	CO2	summarize the solution technique for dynamics of MDOF systems.
	CO3	design and develop analytical skills to calculate natural frequencies and mode shape
	CO4	analyze for lateral load on structures
19CESE2014 /1 DESIGN OF TALL STRUCTURES	CO1	identify about different systems and various loads in Tall structures
	CO2	identify about various structural systems and their behavior
	CO3	interpret static, dynamic and stability analysis of various systems

	CO4	classify various Flooring systems and modern progress of tall structures
19CESE2014/2 ---- SOIL STRUCTURE INTERACTION	CO1	elucidatesoil structure interaction concept and complexities involved.
	CO2	evaluate soil structure interaction for different types of structures under various conditions of loading and subsoil characteristics
	CO3	evaluate interaction analysis of pile and pile groups with rigid cap.
	CO4	evaluate action of group of piles under lateral loading considering stress-strain characteristics of real soils.
19CESE 2014/3 ADVANCED BRIDGE ENGINEERING	CO1	develop a sound knowledge on investigation of hydrological and geological details including flood discharge estimation for major bridge proposals.
	CO2	design beam and slab bridge decks.
	CO3	design various components of a bridge sub structure.
	CO4	design box girder concrete bridges and bearings.
19CESE 2014/4 ADVANCED PRE-ENGINEERED BUILDINGS	CO1	classify structural stability system of pre-engineered buildings.
	CO2	design pre-engineered buildings with crane systems.
	CO3	design pre-engineered buildings with mezzanine floor systems.
	CO4	analyse and design pre-engineered buildings with

		optimization.
19CESE2015/1 REPAIR AND REHABILITATION OF STRUCTURES	CO1	identify the causes for deterioration of structures and remedies through damage assessment.
	CO2	learn various methods of diagnosis for the damage by Semi destructive and non-destructive tests
	CO3	identify the effect of earthquake on structures and repairs in chemical environment and fire damage assessment through case studies
	CO4	identify various retrofitting techniques and repair procedures
19CESE2015/2 DESIGN OF STEEL-CONCRETE COMPOSITE STRUCTURES	CO1	identify the behaviour of composite beams and columns
	CO2	design composite beams, columns and trusses
	CO3	design connections in composite structures
	CO4	Identify the behaviour of composite girder bridges.
19CESE2015/3 FORM WORK DESIGN	CO1	select a right material for manufacturing false work and form work suiting specific
	CO2	identify the pressure of concrete on form work
	CO3	Design decking, form work and false work.
	CO4	classify the sequence of construction of civil engineering structures and safety steps involved in the design of form work and false work.
19CESE2015/4 EARTHQUAKE RESISTANT DESIGN OF	CO1	Plan a good structural configuration for seismic resistance.

STRUCTURES	CO2	Calculate the earthquake design forces using appropriate methods as per IS 1893-2002(Part-I).
	CO3	Apply the concept of Ductility and Base isolation in designing earthquake resistant structures.
	CO4	Design the structure using IS 13920 code provisions.
19CESE2051 STRUCTURAL ENGINEERING LABORATORY	CO1	Obtain the unknown resistance and static strain using accepted principles
	CO2	Determine the principal stresses for various loadings
	CO3	Determine the response of three storeyed building under harmonic and non-harmonic base motions
	CO4	Understand and apply the concept of Vibration isolation and vibration absorber
19CESE2052 STRUCTURAL DESIGN LAB	CO1	analyze and design the structural components like beams, slabs &columns.
	CO2	analyze&design framed buildings for earthquake & wind loads
	CO3	prepare detailed drawings for structural elements
	CO4	generate Building Information Model