M.Tech Civil Engineering: III Semester		
S.No.	**Course Code**	**Course Outcome**
1.	CE-513	To Illustrate Limit state design philosophy and analysis of beams by Moment redistribution method.
		To Explain Concept of yield lines and design of slab using yield lines
		To Analyse the flexural, compression members and design of shear walls.
		To Analyse and design Pre-stressed continuous beams.
		To Analyse and design deep beams and Application of ABAUS general-purpose software for analysis and design.
2.	ADVANCED MATHEMATICS	Evaluate system of linear equations using LU decomposition, Jacobi and Gauss-Seidal method
		Formulate solution of first and second order differential equation by Runge-Kutta method and numerical solution of parabolic and elliptic partial differential equations.
		Express numerical solution of ordinary and partial differential equations using Galerkins method and collocation method of least squares.
		Assess probability distributions, examine the sampling theory and apply their properties in engineering problems.
		Devise testing of hypothesis, concept of design of experiments and bivariate distributions.
3.	CE514	Analyze solid mechanics problems using classical methods and energy methods.
		Calculate the torsion in bars and thin walled members;
		Design various failure criteria for general stress states at points.
		Express the theory of elasticity including strain/displacement and Hooke's law relationships.
		Calculate the stresses and deflections of beams on elastic foundations.
4.	Advanced	Analysis of indeterminate structures and adopt an

	Structural Analysis CE512	appropriate structural analysis technique
		Compare the response of structures by classical, iterative methods.
		Design the various structural members.
		Analyse different indeterminate structures using Matrix methods.
		Design concrete beams/columns by using of STAAD
5.	CE-511	Understand the fundamentals and overview of process control, the static and dynamic analysis of instrumentation system
		Apply the concept of Simulation and Modeling.
		Able to develop Advanced Control Schemes for real time applications
		Able to Design Multi-loop Controllers and Digital controllers
		Analyze Real Time Control strategies

M.tech 1st year Civil (Even Semester)		
S.No.	**Course Code**	**Course Outcome**
1.	CE521	To understand the use of the basic concepts for steel structural analysis using truss, beam, frame and their buckling behaviour.
		To understand the Limit state design and salient features of IS: 800 Euro code EC3 for analysis of Steel structures.
		To analyse the behaviour of cold formed thin waffled structure and their design
		Students are able to design various types of connection and analyse various effects like fracture, fatigue and fire on steel structures.
		To analyse and design multi storey steel building by using modern tools like SAP and STAAD.

2.	Design of bridge substructure	To Estimate the Scour Depth and Depth of foundation as per design guidelines based on IRC 78
		To Analyze of cracked and uncracked section and piers and abutment for bridges
		To Design of well foundation as per IRC 45 and detailing of well foundation component
		To Design pile foundation and under reamed pile
3.	CE-522	To Understand basic concept of bridge engineering, their types, specifications and selection criteria of bridge.
		Computer modelling of multi- lane simply supported and continuous bridge, piers, bearing and T- beam bridges using SAP and STAAD
		To Analyse and design multi lane T- beam pre-stressed bridges, box girder bridge and cable stayed bridge.
		To Analyse and design of two lane steel truss bridge super structure.
		To design elastomeric bearing and explain the various long term effects of concrete.
4.	CE524	To analyse the circular and rectangular plates.
		To illustrate the design criteria and code specification.
		To Explain the classification of shells and classical shell theories and apply them in engineering design
		To Explain singly curved shells, doubly curved shells and cylindrical shells.
		To analyse and Design the folded plates.
5.	CE515	To Explain the fundamentals of the FEA method and Polynomial forms.

		To Illustrate the Application of FEA in solid mechanics for analysis of material.
		To Illustrate the Application of FEA in structural dynamics and mass.
		To develop a basic understanding of Non linear problems and understand the possible error sources in its use.
		To create models for trusses, frames, plate structures, machine parts, and components using ANSYS and ABAUS general-purpose software.

M.tech Civil 2nd Year Odd Semester

1.	CE-525	Design & Analysis of different loads on Cable stayed Bridge using 2D & 3D linear & non linear analysis.
		To Design and Analysis of Decks, pylon , Tension Anchors & application of advanced construction techniques
		Analysis & design of different types of suspension bridges & trusses
		To analyze the connections used in cable stayed bridges like bracings, anchoring
		Analysis of suspension bridges by stiffness & deflection theory and design of anchorage.
2.	CE-526	Some understanding of types, manufacturing processes, and applications of composite materials
		Ability to analyze problems on macromechanical behavior of laminate
		Ability to analyze problems on bending, buckling, and vibration of laminated plates and beams

		Ability to obtain laminate behavior using a computer program
		Ability to perform literature search on a selected advanced material topic and giving class presentation
3.	PROJECT	Identify structural engineering problems reviewing available literature.
		Identify appropriate techniques to analyze complex structural systems.
		Apply engineering and management principles through efficient handling of project
4.	seminar ce531	To enhance communication skills of students using presentation.
		Carry out review of existing literature in line with the assigned topic.
		To make students able to analyse the latest technical trends.

M.tech Civil 2nd Year Even Semester

M.Tech Civil Engineering		
S.No.	Course Code	Course Outcome
1.	DISSERTATION II	Solve complex structural problems by applying appropriate techniques and tools.
		Exhibit good communication skill to the engineering community and society.

		Demonstrate professional ethics and work culture.