SCHEME OF COURSE WORK

Course Details:

Course Title	**: Advanced Steel Structural Design**		
Course Code	**: 15CE2209**	**L P C**	**: 4 0 3**
Program:	**: M. Tech.**		
Specialization:	**: Structural Engineering**		
Semester	**: I**		
Prerequisites	**:**		
Courses to which it is a prerequisite	**: None**		

Course Outcomes (COs):
At the end of the course, the student will be able to:

1	Analysis and design the truss type rolling stock (moving vehicle)and pedestrian bridges.
2	Analysis and design high tension transmission line towers
3	Analysis and design self – supporting steel chimneys for industrial purposes.
4	Analyse and design North light roof trusses and lattice girders for industrial buildings.
5	Associate and perform analysis and design of elevated steel water tanks to store oil and water.

Program Outcomes (POs):
Post graduates will be able to:

1	Apply the knowledge of basic infrastructure requirements for the development of towns, cities and satellite towns
2	Critically analyse the usage of natural resources in construction materials.
3	Evaluate a wide range of potential solutions for the alternative methods and techniques which can be adopted effectively keeping economic considerations of the project.
4	Apply scientific knowledge to analyse various problems of infrastructural engineering and to provide possible solutions by pursuing research
5	Select appropriate modern engineering and IT tools for the design and construction of civil engineering infrastructure project.
6	Attain the capability to work in multidisciplinary teams to achieve common goals.
7	Demonstrate knowledge and understanding of engineering and management principles in multidisciplinary environments after consideration of economic and financial factors.
8	Communicate effectively on complex engineering activities to prepare reports and make presentations.
9	Ability to engage in life-long learning independently to improve knowledge.
10	Understand the responsibility of carrying out professional practices ethically for sustainable development of society.
11	Examine critically and independently one's actions and take corrective measures by learning from mistakes.

Course Outcome versus Program Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO-1	M		M			M					M
CO-2	M	S	S	M		S					M
CO-3	S	M	M	S		M					S
CO-4	M	S		M		M					M
CO-5	S	S	S	M	S	S		M			M

S - Strongly correlated, M - Moderately correlated, *Blank - No correlation*

Assessment Methods:	Assignment / Seminar / Mid-Test / End Exam

Teaching-Learning and Evaluation

Week No.	**TOPIC / CONTENTS**	**CO**	**Sample questions**	**TEACHING-LEARNING STRATEGY**	**Assessment Method & Schedule**
1	Design of pedestrian bridge (N-truss and Pratt),	CO-1	Design a prat type pedestrian brige for a span of 10m?	▫ Lecture ▫ Demonstration	Assignment (Week 2 - 4)
2	Design through type truss member for dead load and equivalent live load including top, bottom bracings and portal bracing.	CO-1	Design a N type truss railway bridge for a span of 30m?	▫ Lecture / Discussion	Mid-Test 1 (Week 9)
3	Design through type truss member for dead load and equivalent live load including top, bottom bracings and portal bracing	CO-1	Design a N type truss railway bridge for a span of 40m, and design the bottom and top chord members& and lateral bracing system at the mid span.	▫ Lecture ▫ Problem solving	
4	Analysis for transmission line tower.	CO-1	Analysis of forces for the given geometry of line tower under broken wire conditions?	▫ Lecture / Problem solving /Discussion	
5	Analysis and design for transmission line tower.	CO-2	Analysis of forces for the given geometry of tangent tower under normal wire conditions?	▫ Lecture / ▫ Discussion	
6	Design for transmission line tower.	CO-2	Design the geometry of transmission line tower for the given data include clearance distance, span?	▫ Lecture / ▫ Discussion	
7	Design for transmission line tower.	CO-2	Design a transmission line tower for the given data include clearance distance, span	▫ Lecture ▫ Problem solving	

8	Design of self supporting steel chimneys.	CO-3	Design a self support chimney for the given height & wind loads?	▫ Lecture ▫ Problem solving	
9	**MID TEST – I**			▫	
10	Design of self supporting steel chimneys including foundations.	CO-3	Design the foundation of self support steel chimney for the given height & wind loads?	▫ Lecture ▫ Discussion ▫ Problem solving	Mid-Test 2 (Week 18)
11	Design of self supporting steel chimneys including foundations	CO-4	Design the chimney shell at various heights for the given data?	▫ Lecture / ▫ Discussion	
12	Design of North light Trusses	CO-4	Design a north light roofing truss for the given span and location of Industrial building?	▫ Lecture / ▫ Discussion	
13	Design of North light Trusses	CO-5	Design the geometry of a north light roofing truss for the given span and location of Industrial building?	▫ Lecture / ▫ Discussion	
14	Design of lattice girder.	CO-5	Design a lattice girder for given span and loading conditions?	▫ Lecture / ▫ Discussion	
15	Design of lattice girder.	CO-5	Calculate the forces for given geometry of lattice girder?	▫ Lecture / ▫ problem solving	Seminar (Week 15)
16	Design of water storage	CO-5	Calculate the member forces for given geometry of elevated water tank	▫ Lecture / ▫ Discussion	
17	Design of oil storage steel tanks.	CO-5	Design a steel water tank for the given quantity of water and pressure head?	▫ Lecture / ▫ Discussion/ problem solving	
18	**MID TEST – II**			▫	
19/20	**END EXAM**			▫	