Model Template for Scheme of Course Work

to be submitted by the Faculty of B.Tech/M.Tech/MCA I semester on or before 11.10.2013 to
bhanucvk@gvpce.ac.in and yadavalliraghu@yahoo.com

SCHEME OF COURSE WORK

Course Details:

Course Title	: **Advanced Methods of Structural Analysis**			
Course Code	: **13CE2204**	**L P C**		**: 4 0 3**
Program:	: **M. Tech.**			
Specialization:	: **Structural Engineering**			
Semester	: **I**			
Prerequisites	: **Strength of Materials, Structural Analysis, Finite Element Methods.**			
Courses to which it is a prerequisite		: **None**		

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

1	Analyze beams, building frames and trusses by flexibility matrix method.
2	Analyze beams, building frames and trusses by stiffness matrix method.
3	Apply the concept of ILDs for beams and trusses.
4	Analyze cables and suspension bridges.
5	Apply Rayleigh Ritz method and Galerkin's method for beams and bars.

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

1	Synthesize existing and new knowledge in various sub areas of structural engineering
2	Analyse complex engineering problems critically with adequate theoretical background for practical applications.
3	Evaluate a wide range of feasible and optimal solutions after considering safety and environmental factors.
4	Demonstate the ability to pursue research by conducting experiments and extract the relevant information through literature surveys.
5	Use state –of- the- art of modern tools for interpeting the behaviour and modeling of complex engineering structures.
6	Attain the capability to work in multi disciplinary teams to achieve common goals.
7	Demonstrate the knowledge to perform the projects efficiently in multi disciplinary environments after consideration of economical and financial matters.
8	Communicate effectively on complex engineering activities to prepare reports and make presentations.
9	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.

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Course Outcome versus Program Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1	S	S	M	M								M
CO-2	S	S	M	M								M
CO-3	S	S	M	M								M
CO-4	S	S		M								M
CO-5	S	S	S	M	S							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	Course Outcomes	Sample questions	TEACHING-LEARNING STRATEGY	Assessment Method & Schedule
1	Introduction to Indeterminate beams and conventional methods analysis of indeterminate beams	CO-1	Distinguish between Determinate indeterminate beams Identify the indeterminate beams from the following beams	▫ Lecture/ Discussion	
2	Formulation of flexibility matrix for the indeterminate beam system. Step by step procedure to solve the indeterminate beams by flexibility method	CO-1 CO-1	Formulate the flexibility matrix for the given continuous beam Analyse the given indeterminate beam by flexibility method	▫ Lecture ▫ Lecture ▫ Problem solving	
3	Solve the frames by flexibility method	CO-1	Analyse the given frame by flexibility method	▫ Lecture ▫ Problem solving	
4	Formulation of flexibility matrix for the truss system Solve the trusses by flexibility method	CO-1 CO-1	Formulate the flexibility matrix for the given truss system Analyse the given truss by flexibility method	▫ Lecture ▫ Lecture ▫ Problem solving	Assignment
5	Formulation of stiffness matrix for the indeterminate beam system	CO-2	Formulate the stiffness matrix for the given continuous beam	▫ Lecture ▫ Lecture ▫ Problem solving	

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6	Step by step procedure to solve the indeterminate beams by stiffness method	CO-2	Analyse the given frame by flexibility method	▫ Lecture	
	Solve the frames by flexibility method	CO-2	Analyse the given indeterminate beams by stiffness method	▫ Problem solving	
7	Formulation of stiffness matrix for the truss system	CO-2	Formulate the stiffness matrix for the given truss system	▫ Lecture	Assignment
	Solve the trusses by stiffness method	CO-2	Analyse the given truss by stiffness method	▫ Lecture ▫ Problem solving	
8	Introduction to influence lines Analysis of indeterminate beams by influence lines	CO-3	Analysis the given continuous beams by using influence lines methods	Lecture	
	Analysis of three hinged arches by influence lines	CO-3	Analysis the given three hinged arches by using influence lines methods	▫ Lecture Problem solving	
9	**MID TEST - I**				
10	Analysis of two hinged arches by influence lines	CO-3	Analysis the given two hinged arches by using influence lines methods	▫ Lecture Problem solving	
11	Analysis of Pratt type of trusses using influence lines	CO-3	Analysis the given Pratt type of trusses by using influence lines methods	▫ Lecture Problem solving	Assignment
12	Introduction, Equation of the cable, General Cable theorem	CO-4	Derive the equation of the cable	▫ Lecture Problem solving	
13	Horizontal reaction for uniformly loaded cable, Tension in the cable supported at same and different levels	CO-4	Calculate the horizontal reaction of the cable subjected to UDL	▫ Lecture Problem solving	
14	Lengths of the cable when supported at the same level. Temperature effect on the cable.	CO-4	Calculate the lengths of the cable subjected to temperature	▫ Lecture Problem solving	
15	Analysis of axially loaded bars by Rayleigh Ritz method.	CO-5	Calculate the stresses of a axially loaded bar using Rayleigh Ritz method.	▫ Lecture Problem solving	
16	Analysis of axially loaded beams by Rayleigh Ritz method.	CO-5	Calculate the stresses of a axially loaded beam using Rayleigh Ritz method.	▫ Lecture Problem solving	Assignment
17	Analysis of axially loaded bars and beams by Gelarkin's method.	CO-5	Calculate the stresses of a axially loaded bar using Gelarkin's method.	▫ Lecture Problem solving	

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18	MID TEST - II				
	END EXAM				