Model Template for Scheme of Course Work

to be submitted by the Faculty of B.Tech/M.Tech/MCA I semester

:MECHANICAL VIBRATIONS AND CONDITION MONITORING

SCHEME OF COURSE WORK

Course Details:

Course Title	**: MECHANICAL VIBRATIONS AND CONDITION MONITORING**		
Course Code	**:15ME1133**	**L P C**	**:4 -- 3**
Program:	**: B.Tech.**		
Specialization:	**:**		
Semester	**: VI**		
Prerequisites	**:Engg Mechanics, Theory of machines**		
Courses to which it is a prerequisite	**:**		

COURSE OUTCOMES:

The student will be able

CO1: Analyze free and forced vibrations of single degree of freedom systems

CO2: Analyze multi degree freedom system for forced vibrations with and without damping

CO3: Solve the nonlinear vibration problems using different analytical and graphical methods.

CO4: Calculate unbalanced forces in rotating machinery and reciprocating engines, explain concept of vibration absorber

CO5 :Describe various condition monitoring techniques to diagnose the machine condition

MAPPING OF COURSE OUTCOMES VS PROGRAM OUTCOMES

Course outcomes	Program outcomes											
	1	2	3	4	5	6	7	8	9	10	11	12
CO 1	M	M	S		M		M		M			M
CO 2			M						M			
CO 3	M		M						M			
CO 4	M	M	M	M			M		S			M
CO 5	M	S	S	M			M		S			

Write samples of learning at different cognitive levels in a course(Cognitive means intellectual outcomes-six cognitive levels- Remember, Understand, Apply, Analyze, Evaluate, Create)

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CO No.	Course outcomes	Cognitive level
CO1	Analyze free and forced vibrations of single degree of freedom systems	Evaluate
CO2	Analyze multi degree freedom system for forced vibrations with and without damping	Apply
CO3	Solve the nonlinear vibration problems using different analytical and graphical methods.	Evaluate
CO4	Calculate unbalanced forces in rotating machinery and reciprocating engines, explain concept of vibration absorber	Apply
CO5	Describe various condition monitoring techniques to diagnose the machine condition	Apply

AssessmentMethods:	Assignment / Quiz / Seminar / Case Study / Mid-Test / End Exam

Teaching-Learning and Evaluation

Week	TOPIC / CONTENTS	Course Outcomes	Sample questions	TEACHING-LEARNING STRATEGY	Assessment Method & Schedule
1	Response of damped and undamped system	CO-1	Derive response of forced vibration sytem	▫ Lecture / Discussion/PPT	Assignment (Week 5 - 7) Mid-Test 1 (Week 9)
2,3	Free and forced vibration analysis of two degree system	CO-1	1. explain two rotor torsional system	▫ Lecture / Discussion/ Seminars	Assignment (Week 5 - 7) Mid-Test 1 (Week 9)
4,5	Co ordinate coupling and forced vibration analysis	CO-1	Explain co ordinate coupling with suitable example	▫ Lecture / Discussion/PPT	Assignment (Week 5 - 7) Mid-Test 1 (Week 9)
6	Influence co efficients	CO-2	Find influence coefficients of following system	▫ Lecture / Discussion/PPT	Assignment (Week 5 - 7) Mid-Test 1 (Week 9)
7,8	Lagranges equation , Eigen values, forced vibration of viscously damped system	CO-2	Determine eigen values of following system	▫ Lecture / Discussion/PPT	Assignment (Week 5 - 7) Mid-Test 1 (Week 9)
9	Mid test-I				
10	Non linear vibration introduction and different methods to solve	CO-3	Explain non linear vibrations with suitable examples	▫ Lecture ▫ Discussion	Seminar Mid-Test 2 (Week 18)
11,12	Sub harmonic and super harmonic solution, systems with time dependent co	CO-3	Explain limit cycles	▫ Lecture	Seminar Mid-Test 2

	efficient, limit cycles and chaos				(Week 18)
13,14	Vibration control,	CO-4	What are various methods to control vibration	▫ Lecture ▫ Seminars	Quiz/ Seminar
15	Vibration isolation and vibration absorbers	CO-4	Explain principle of vibration absorber system	▫ Lecture ▫ Discussion ▫ Power Point Presentation	Seminar Mid-Test 2 (Week 18)
16,17	Condition monitoring techniques	CO-5	Explain diagnosis of machine using condition monitoring technique	▫ Lecture ▫ Seminars	Seminar
18	**Mid-Test 2**				
19/20	**END EXAM**				