SCHEME OF COURSE WORK

Course Title	MECHANICAL VIBRATIONS LAB		
Course Code	19ME2157	L P C	0 3 1.5
Program:	M.Tech.		
Specialization:	CAD/CAM		
Semester	I		

Course Outcomes (COs):

At the end of the course, the student will be able to

CO-1	Compare bending test and tension test results using numerical and experimental analysis
CO-2	Analyze vibration of spring mass system and validate the numerical analysis results with experimental results
CO-3	Demonstrate the gyroscopic effect and estimate the torsional fatigue strength of steels.
CO-4	Demonstrate the single plane and multiplane balancing.
CO-5	Analyze the mechanical faults of rotating machines using NFT test and FFT test

Program Outcomes (POs)

PO Code	**Program Outcome (PO)**
PO1	acquire fundamentals in the areas of computer aided design and manufacturing
PO2	apply innovative skills and analyze computer aided design and manufacturing problems critically
PO3	identify, formulate and solve design and manufacturing problems
PO4	carry out research related to design and manufacturing
PO5	use existing and recent CAD/CAM software
PO6	collaborate with educational institutions, industry and R&D organizations in multidisciplinary teams
PO7	apply project and finance management principles in engineering projects
PO8	prepare technical reports and communicate effectively
PO9	engage in independent and life-long learning and pursue professional practice in their specialized areas of CAD/CAM
PO10	exhibit accountability to society while adhering to ethical practices
PO11	act independently and take corrective measures where necessary

Course Outcome versus Program Outcomes:

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

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

Teaching-Learning and Evaluation

WEEK	TOPIC / CONTENTS	COURSE OUTCOMES	SAMPLE VIVA QUESTIONS	TEACHING-LEARNING STRATEGY	ASSESSMENT METHOD & SCHEDULE
1	Tension test on mild steel specimen	CO1	1. Draw stress and strain diagram. 2. Define tensile and bending strength. 3. What are elements used for numerical analysis?	Experiment	Day to day experiments, Record
2	Bending test on mild steel specimen	CO1			
3	Numerical analysis of tension test	CO1			
4	Numerical analysis of bending test	CO1			
5	Free vibration analysis of spring mass system	CO2	1. Define spring stiffness. 2. Define natural frequency. 3. What are the boundary conditions used for numerical analysis?	Experiment	
6	Numerical (Modal and Harmonic) of spring mass system	CO2			
7	Experimental analysis of gyroscope couple	CO3	1. Define gyroscopic couple. 2. Define endurance limit. 3. What are the applications of gyroscopic couple?		
8	Fatigue test on rotating shaft	CO3			
9	**Internal Exam on CO-1, C0-2 and CO-3**				
10	Dynamic balancing of rotating machines	CO4	1. Explain forces causes for vibrations. 2. What are the instruments used for balancing. 3. What is the difference between single plan balancing and multi plane balancing	Experiment	Day to day experiments, Record
11	Single plane balancing of axial fan using FFT analyzer	CO4			
12	Multi plane balancing of given masses	CO4			
13	Natural frequency test using FFT analyzer and Impact Hammer	CO5	1. What are the instruments used for NFT test. 2. What are the instruments used for FFT test. 3. Classify various mechanical faults	Experiment	
14	Forced vibration analysis using FFT analyzer and Impact Hammer	CO5			
15	Fault diagnosis of rotating machines using FFT analyzer and Impact Ham	CO5			
16	Noise and vibration analysis of axial fan using FFT analyzer	CO5			
17	Backlog class				
18	**Internal Exam – 1 on CO-4 and CO-5**				
19/20	END EXAM	All Cos			