

B. E. MECHANICAL ENGINEERING			
Choice Based Credit System (CBCS) and Outcome Based Education (OBE)			
SEMESTER - VII			
DESIGN LAB			
Course Code	18MEL77	CIE Marks	40
Teaching Hours /Week (L:T:P)	0:2:2	SEE Marks	60
Credits	02	Exam Hours	03
<b>Course Learning Objectives:</b>			
<ul style="list-style-type: none"><li>To understand the concepts of natural frequency, logarithmic decrement, damping and damping ratio.</li><li>To understand the techniques of balancing of rotating masses.</li><li>To verify the concept of the critical speed of a rotating shaft.</li><li>To illustrate the concept of stress concentration using Photo elasticity.</li><li>To appreciate the equilibrium speed, sensitiveness, power and effort of a Governor.</li><li>To illustrate the principles of pressure development in an oil film of a hydrodynamic journal bearing.</li></ul>			
Sl. No.	Experiments		
PART - A			
1	Determination of natural frequency, logarithmic decrement, damping ratio and damping coefficient in a single degree of freedom vibrating systems (longitudinal and torsional).		
2	Balancing of rotating masses		
3	Determination of critical speed of a rotating shaft		
4	Determination of equilibrium speed, sensitiveness, power and effort of Porter/Proell /Hartnel Governor.		
PART - B			
5	Determination of Fringe constant of Photo-elastic material using. a) Circular disc subjected to diametral compression. b) Pure bending specimen (four-point bending).		
6	Determination of stress concentration using Photo-elasticity for simple components like plate with a hole under tension or bending, circular disk with circular hole under compression, 2D Crane hook		
7	Determination of Pressure distribution in Journal bearing		
8	Determination of Principal Stresses and strains in a member subjected to combined loading using Strain		
9	Determination of stresses in Curved beam using strain gauge.		
<b>Course Outcomes:</b> At the end of the course, the student will be able to:			
CO1: Compute the natural frequency of the free and forced vibration of single degree freedom systems, critical speed of shafts.			
CO2: Carry out balancing of rotating masses.			
CO3: Analyse the governor characteristics.			
CO4: Determine stresses in disk, beams, plates and hook using photo elastic bench.			
CO5: Determination of Pressure distribution in Journal bearing			
CO6: Analyse the stress and strains using strain gauges in compression and bending test and stress distribution in curved beams.			
<b>Conduct of Practical Examination:</b>			
1. All laboratory experiments are to be included for practical examination.			
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.			
3. Students can pick one experiment from the questions list prepared by the examiners.			