Lesson Plan

Name of Institute : Ambala College of Engineering and Applied Research
Name of the Faculty member : Er. Ajay Kumar
Discipline : Mechanical Engineering
Semester : 4th
Subject : Mechanical Vibration & Tribology (B24-MEC-204)
Lesson Plan Duration : 15 weeks (from Jan 2026 to May 2026)
Work Load : L 3 T 1 P 2

Week	Theory		Practical	
	Lecture day	Topic (including assignment/ test)	Practical day	Topic
1st	1	Elements of a vibratory system	1	To determine the radius of gyration of a simple pendulum
	2	S.H.M , Degrees of freedom, Types of vibrations		
	3	Work done by a harmonic force		
2nd	4	Beats	2	To determine the radius of gyration of a compound pendulum
	5	Undamped free vibrations		
	6	Natural frequency by equilibrium		
3rd	7	Energy methods for solving problems	3	To determine the radius of gyration of given bar using bifilar suspension
	8	Equivalent spring & linear systems		
	9	Torsional systems		
4th	10	Simple & compound pendulum	4	Viva- Voce
	11	Bifilar and Trifilar suspensions		
	12	Forced Vibrations, Sources of excitation		
5th	13	Equations of motion with harmonic force	5	To study undamped free vibrations of equivalent spring mass system and determine the natural frequency.
	14	Response of rotating unbalanced system		
	15	Response of reciprocating unbalanced system		
6th	16	Revision/Numerical Practice	6	
	17	Revision/Numerical Practice		
	18	Sessional- I		
7th	19	Support motion & Vibration Isolation	7	To study the torsional vibration of a single rotor shaft system and determine the natural frequency
	20	Force and Motion transmissibility		
	21	Forced vibrations with coloumb damping		
8th	22	Structural damping and viscous dampings.	8	To study the forced vibration of system with damping. Load magnification factor vs. Frequency and phase angle vs frequency curves. Also determine the damping factor.
	23	Multi-degree of freedom systems, Principle modes of vibrations		
	24	Influence co-efficient		
9th	25	Matrix method, orthogonality principle	9	Viva- Voce
	26	Dunkerleys equation, Matrix iteration method		
	27	Holzer Method, Rayleigh Method		
10th	28	Rayleigh-Ritz methods, Stodola method	10	
	29	Hamilton principle, Numerical Practice		

	30	Sessional-II		
11th	31	Transverse vibrations of strings	11	To study the free vibration of system for different damper settings. Draw decay curve and determine the log decrement and damping factor. Find also the natural frequency
	32	Longitudinal Vibrations of bars		
	33	Lateral vibration of beams		
12th	34	Torsional vibration of circular shafts	12	To evaluate the wear and extreme pressure properties of a lubricating oil by using four ball tester.
	35	Tribology in design, Tribology in industry		
	36	economic aspects of Tribology, modes of lubrication, lubricants, properties of lubricants		
13th	37	Types of additives, extreme pressure lubricants, recycling of used oils	13	Viva-Voce
	38	Oil conservation, disposal of scrap oil, oil emulsion		
	39	laws of friction, kinds of friction, causes of friction		
14th	40	friction measurement, theories of friction	14	
	41	Effect of surface preparation. Introduction to Wear, Types of wear		
	42	various factors affecting wear, measurement of wear, wear between solids and liquids		
15th	43	Theories of wear	15	
	44	Numerical Practice		
	45	Sessional-III		

(Signature of the teacher concerned with date)