

Name of Faculty Sachin Jasuja  
 Discipline Mechatronics Engineering  
 Semester 3rd  
 Subject MT-209 N Theory of Machines-I  
 Lesson Plan Duration 15 Weeks  
 Work Load (Lecture) per week: Lecture 3

Week	Theory		Practical	
	Lecture Day	Topic	Practical day	Practical
1	1	Kinematics, introduction to analysis and 1, Kinematics' pairs,	1	To determine the modulus of rigidity of the material of a closed coil helical spring and the stiffness of a spring
	2	Degree of freedom, Dynamitic chain mechanism		
	3	Machine, Four-bar chain, inversions		
2	4	Single and double slider crank chain,	2	To determine the value of coefficient of friction for a given pair of surfaces using friction apparatus
	5	Quick return mechanisms,		
	6	Introduction to function generation		
3	7	Path generation and rigid bodied guidance	3	To determine the modulus of rigidity of horizontal shaft
	8	Velocity determination; Relative velocity methods		
	9	Instantaneous center method Acceleration determination		
4	10	Kennedy's Space cent rode and body cent rode	4	To determine experimentally the ratio of the cutting time to idle time (cutting stroke to idle stroke) of the crank and slotted lever (QRM)/ Whitworth and compare the result to theoretical values plot the following
	11	TEST		
	12	Centripetal and tangential accelerations,		
5	13	Acceleration determination by graphical method using velocity polygons	5	a. $\theta$ v/s X (displacement of slider).

	14	Cariole's component of acceleration, Klein's and other constructions		b. $\theta$ v/s velocity. c. $\theta$ v/s
	15	Introduction, Velocity and Acceleration of a Particle Moving with Simple Harmonic Motion,		Acceleration and to compare the values of velocities (Take angles $\theta = 45^\circ, 90^\circ, 135^\circ, 225^\circ, 270^\circ$ & $335^\circ$ , $\omega = 1$ rad/s)
6	16	Differential Equation of Simple Harmonic Motion,	6	To determine the value of coefficient of friction between the screw and nut of the jack, while: a. Raising the load b. Lowering the load
	17	Terms Used in Simple Harmonic Motion		
	18	Simple Pendulum, Laws of Simple Pendulum		
7	19	Closely-coiled Helical Spring. Compound Pendulum	7	To determine the value of coefficient of friction between the screw and nut of the jack, while: a. Raising the load b. Lowering the load
	20	Centre of Percussion, Bifilar Suspension,		
	21	Trifilar Suspension (Torsional Pendulum).		
8	22	Test	8	To draw experimentally a curve of the follower-displacement v/s cam-angle. Differentiate the above curve to get velo
	23	Pantograph, straight-line motion mechanisms		
	24	(Peculiar, Hart, Scott Russell, Grasshopper, Watt		
9	25	Kemp's Tchybishev, Parallel linkages)	9	To determine the coefficient of friction between belt and pulley and plot a graph between $\log_{10} T_1/T_2$ v/s, $\theta$ .
	26	Indicator mechanisms		
	27	(Simplex Crosby, Thomson, etc)		
10	28	Automobile steering gears (Davis and Ackerman),	10	To determine the displacement, velocities, & accelerations of the driven shaft of a Hooke's joint for a constant speed of the driver shaft.
	29	Hooks joint (universal coupling), Double hooks joints.		
	30	Types of friction, Laws of dry friction,		

11	31	Motion along inclined plane Screw threads,	11	Study of bifilar and trifilar suspension system
	32	Wedge, Pivots and collars, Plate and cone clutches,		
	33	Antifriction bearings, friction circle and friction axis,		
12	34	bearings and lubrication. Motion along inclined plane and screws,	12	Study of the inversions of the single slider crank mechanism.
	35	Pivots and Collars Thrust Bearings lubrication		
	36	Test		
13	37	Types of cams and followers	13	To verify the law of moment using Bell- crank lever.
	38	various motions of the follower, Construction of cam profiles		
	39	Analysis for velocities and accelerations of tangent		
14	40	and circular arc cams with roller and flat	14	Practice and doubt session
	41	Open and crossed belt drives, velocity ratio, slip		
	42	material for belts, crowning of pulleys,		
15	43	law of belting, types of pulleys,	15	Internal viva-Voce
	44	length of belts ratio of tensions, centrifugal tension, power transmitted by belts and ropes,		
	45	initial tension, creep, chain drive, chain length, classification of chains		