

**PANIPAT INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
**PANIPAT**  
**Department of Mechanical Engineering**  
**LESSON PLAN**

**Subject Name: - Theory of Machines**

**Branch/Semester: - 3<sup>rd</sup> SEM**

**Subject Code:-MEC-201A**

S.No.	Lecture No.	Topics to be covered	ICT Tools
1.	L-1	<b>UNIT- I Simple Mechanisms:</b> Introduction to mechanism and machine, Kinematic links, pairs and chains,	Power Point Presentation
2.	L-2	Mobility of mechanisms, Equivalent mechanisms, Four bar chain,	Power Point Presentation
3.	L-3	Inversion of four bar chain, slider crank chain and inversions	Power Point Presentation
4.	L-4	<b>Velocity Analysis:</b> Determination of link velocities,	Power Point Presentation & Conventional White Board
5.	L-5	Relative velocity method, Velocities in four bar mechanism,	Conventional White Board
6.	L-6	Slider crank mechanism, crank and slotted lever mechanism and quick return motion mechanism,	Conventional White Board
7.	L-7	Instantaneous center method: Types & location of instantaneous centers	Conventional White Board
8.	L-8	Arnold Kennedy theorem,	Conventional White Board
9.	L-9	Methods of locating instantaneous centers, steering gear mechanisms. Problems.	Conventional White Board
10.	L-10	<b>UNIT-II Acceleration Analysis:</b> Acceleration of a point on a link, four bar mechanism and slider crank mechanism,	Conventional White Board
11.	L-11	Coriolis component of acceleration,	Conventional White Board
12.	L-12	Klein's construction, Problems.	Conventional White Board
13.	L-13	<b>Cams and Followers:</b> Classification & terminology,	Conventional White Board
14.	L-14	Cam profile by graphical methods with knife edge and radial roller follower for uniform velocity,	Conventional White Board

15.	L-15	Simple harmonic,	Conventional White Board
16.	L-16	Constant acceleration and deceleration	Conventional White Board
17.	L-17	Cycloidal motion of followers,	Conventional White Board
18.	L-18	Problems.	Conventional White Board
19.	L-19	<b>Unit III- Static and Dynamic Force Analysis:</b> constraints and applied forces, static equilibrium,	Conventional
20.	L-20	Equilibrium of two and three-force member, equilibrium of four-forces and torque,	Conventional White Board
21.	L-21	Free body diagrams. Dynamic Force Analysis	Conventional White Board
22.	L-22	D' Alembert's principle, equivalent offset inertia force, Dynamic analysis of four-link,	Conventional White Board
23.	L-23	Dynamic analysis of slider-crank mechanisms, velocity and acceleration of piston, angular velocity and angular acceleration of connecting rod, turning moment on crank shaft,	Conventional White Board
24.	L-24	Turning moment diagrams, fluctuation of energy,	Conventional White Board
25.	L-25	Flywheels, Problems.	Conventional
26.	L-26	<b>Balancing:</b> rotating masses: Static and Dynamic Balancing,	Conventional White Board
27.	L-27	Single Rotating mass,	Conventional White Board
28.	L-28	Many Masses rotating in same plane and in different planes.	Conventional White Board
29.	L-29	Analytical method for balancing of rotating masses	Conventional White Board
30.	L-30	Reciprocating masses: Balancing of reciprocating engine,	Conventional White Board
31.	L-31	Balancing of Multi-cylinder in line engines,	Conventional White Board
32.	L-32	Balancing machines.	Conventional White Board
33.	L-33	<b>Unit IV- Belts and Chain Drives:</b> classifications of belt, law of belting,	Conventional
34.	L-34	Length of open and cross flat belt, Ratio of tensions, Centrifugal tension,	Conventional

35.	L-35	power transmission, condition for maximum power transmission, creep of belt,	Conventional
36.	L-36	V-belt drives: driving tensions, Chain drives: classifications, terminology of chains, kinematics of chains, Problems.	Conventional
37.	L-37	<b>Gears and Gear Trains:</b> Classification & terminology,	Conventional
38.	L-38	Law of gearing, Tooth forms & comparisons,	Conventional
39.	L-39	Length of path of contact, Contact ratio,	Conventional
40.	L-40	Interference & undercutting in involute gear teeth,	Conventional
41.	L-41	Minimum number of teeth on gear and pinion to avoid interference.	Conventional
42.	L-42	Gear Trains: simple, compound, reverted and planetary gear trains	Conventional
43.	L-43	Problems.	Conventional
44.	L-44	Revision	Conventional