LESSON PLAN

Name of the Faculty	**GAURAV**
Discipline	**Civil Engineering**
Semester	**2nd**
Subject	**Applied Mechanics**
Lesson Plan Duration	**16 Week (from Jan 2025 to May 2025)**

WEEK	THEORY		PRACTICAL	
	LECTURE DAY	**TOPIC**	**PRACTICAL**	**TOPIC**
1	1	Introduction Concept of mechanics,	1st	1. Verification of polygon law of forces using universal force table/Gravesend apparatus.
	2	Classification of mechanics, utility of mechanics in engineering field		
	3	Concept of rigid body		
2	4	scalar and vector quantities.	2nd	1. Verification of polygon law of forces using universal force table/Gravesend apparatus.
	5	2. Laws of forces Definition of force, measurement of force in SI units, its representation		
	6	types of force: Point force/concentrated force & Uniformly distributed force, effects of force		
3	7	characteristics of a force, Different force systems (coplanar and non-coplanar),	3rd	2. Verification of Lami's theorem.
	8	principle of transmissibility of forces, law of superposition		
	9	Free body diagram, Composition and resolution of coplanar concurrent forces, resultant force, method of composition of forces		
4	10	laws of forces, parallelogram law of forces (with derivation), triangle law of forces, polygon law of forces - graphically, analytically, resolution of forces	4th	2. Verification of Lami's theorem.
	11	resolving a force into two rectangular components		
	12	Lami's theorem, Simple numericals, Equilibrium of forces and its determination.		
5	13	Moment Concept of moment, Moment of a force and units of moment	5th	3 To verify law of moments by using Bell crank lever.
	14	Varignon's theorem (definition only), Principle of moment and its applications (Levers – simple and compound, steel yard, safety valve)		
	15	Simple numericals. Parallel forces (like and unlike parallel force),		
6	16	calculating their resultant, Concept of couple, its properties and effects	6th	3 To verify law of moments by using Bell crank lever.
	14	General conditions of equilibrium of bodies under coplanar forces, Position of resultant force by moment.		
	18	4. Friction Definition and concept of friction, types of friction, force of friction		
7	19	Laws of static friction, coefficient of friction, angle of friction	7th	4. To verify the forces in different members of jib crane.
	20	angle of repose, cone of friction, Equilibrium of a body lying on a horizontal plane, equilibrium of a body lying on a rough inclined plane		
	21	Calculation of least force required to maintain equilibrium of a body on a rough inclined plane subjected to a force acting along the inclined plane and		
	22	subjected to a force acting at some angle with the inclined plane, Simple numericals		4. To verify the forces in different

8	23	5. Centre of Gravity and Centroid Concept	8th	members of jib crane.
	24	definition of centroid of plain figures and centre of gravity of symmetrical solid bodies.		
9	25	Axis of symmetry, Reference axis. Determination of centroid of plain and composite lamina (T, L, C and I shape) using moment method only	9th	5. To determine coefficient of friction between three pairs of given surface.
	26	centroid of bodies with removed portion		
	27	Determination of center of gravity of solid bodies - cone, cylinder, hemisphere and sphere; composite bodies and bodies with portion removed		
10	28	6. Laws of Motion Newton's laws of motion and their applications	10th	6. To find out center of gravity of regular lamina.
	29	Concept of momentum. Derivation of force equation from second law of motion		
	30	numerical problems on second law of motion		
11	31	Bodies tied with string, Newton's third law of motion numerical problems	11th	7. To find out center of gravity of irregular lamina.
	32	conservation of momentum, impulse and impulsive force.		
	33	Revision		
12	34	Revision	12th	8. To find the mechanical advantage, velocity ratio and efficiency of a screw jack.
	35	Simple Machines Definition of effort, velocity ratio, mechanical advantage		
	36	efficiency of a machine and their relationship		
13	37	law of machines, Simple and compound machine (Examples).	13th	9. To find the mechanical advantage, velocity ratio and efficiency of worm andworm wheel.
	38	Definition of ideal machine, reversible and self-locking machine		
	39	Effort lost in friction, Load lost in friction		
14	40	determination of maximum mechanical advantage and maximum efficiency, Simple numerical.	14th	10. To find mechanical advantage, velocity ratio and efficiency of single purchase crab.
	41	System of pulleys (first, second, third system of pulleys		
	42	determination of velocity ratio, mechanical advantage		
15	43	Working principle and application of wheel and axle,	15th	Revision
	44	Weston's Differential Pulley Block		
	45	simple screw jack, worm and worm wheel		
16	46	single and double winch crab	16th	Revision
	47	Expression for their velocity ratio and field of their application.		
	48	Revision		