

## LESSON PLAN

**NAME OF FACULTY: SH. HITESH AGGARWAL**

**DISCIPLINE: MECHANICAL ENGINEERING**

**SEMESTER: Ist YEAR**

**SUBJECT: APPLIED MECHANICS**

**LESSON PLAN DURATION: 15 WEEKS**

**WORK LOAD (LECTURE/PRACTICAL) PER WEEK: (2 lectures, 2 Practical)**

WEEK	THEORY		PRACTICALS
	LECTURE NOS	TOPIC	TOPIC
1 <sup>st</sup>	1	<b>Unit-1-</b> Introduction, Concept of engineering mechanics	
	2	Definition of mechanics, statics, dynamics, application of engineering mechanics in practical fields.	
2 <sup>nd</sup>	3	Different systems of units (FPS, CGS, MKS and SI)	
	4	And their conversion from one to another e.g. density, force, pressure, work,	
3 <sup>rd</sup>	5	power, velocity, acceleration (Simple Numerical Problems),	
	6	Fundamental Units and Derived Units. Concept of rigid body, scalar and vector quantities	
4 <sup>th</sup>	7	<b>Unit-2-</b> Laws of forces Definition of force, Bow's Notations, types of force: Point force/concentrated force	
	8	& Uniformly distributed force, effects of force, and characteristics of a force.	
5 <sup>th</sup>	9	Different force systems, principle of transmissibility of forces, law of super-position	
	10	Composition and resolution of coplanar concurrent forces, resultant force, method of composition of forces,	
6 <sup>th</sup>	11	laws of forces, triangle law of forces, polygon law of forces - graphically, analytically, resolution of forces	<b>Practicals-1</b> Verification of the polygon law of forces using Gravesend's apparatus
	12	Free body diagram, Equilibrant force and its determination. Lami's theorem [Simple problems on above topics]	<b>Practical-2-</b> To verify the forces in different members of jib crane.
7 <sup>th</sup>	13	<b>Numerical Problems and its Solutions</b>	
	14	<b>Internal Assessment -I.</b>	
8 <sup>th</sup>	15	<b>Unit-3-</b> Moment ,Concept of moment	
	16	Moment of a force and units of moment	

9th	17	Varignon's theorem (definition only)	
	18	Principle of moment and	
10th	19	its applications (Levers – simple and compound, steel yard,	
	20	its applications (Levers – safety valve, reaction at support)	
11th	21	Parallel forces (like and unlike parallel force), calculating their resultant	
	22	Parallel forces (like and unlike parallel force), calculating their resultant	
12th	23	Concept of Couple	
	24	Properties and effects of Couple	
13th	25	General conditions of equilibrium of bodies under coplanar forces	<b>Practical-3-</b> To verify the reaction at the supports of a simply supported beam
	26	Position of resultant force by moment [Simple problems on the above topics]	
14th	27	<b>Numerical Problems and its Solutions</b>	
	28	<b>Internal Assessment -II.</b>	
15th	29	<b>Unit-4 Friction</b> , Definition and concept of friction	
	30	types of friction, force of friction, Limiting Friction	
16th	31	Laws of static friction, coefficient of friction,	<b>Practical-10-</b> To determine coefficient of friction between three pairs of given surface
	32	Angle of friction, angle of repose.	
17th	33	Equilibrium of a body lying on a horizontal plane,	
	34	Equilibrium of a body lying on a rough inclined plane	
18th	35	Calculation of least force required to maintain equilibrium of a body on a rough inclined plane subjected to a force a) Acting along the inclined plane	<b>Practical-4-</b> To find the mechanical advantage, velocity ratio and efficiency in case of an inclined plane
	36	Calculation of least force required to maintain equilibrium of a body on a rough inclined plane subjected to a force b) At some angle with the inclined plane	
19th	37	Ladder friction, Advantages and Disadvantages of friction	
	38	Methods of increasing/decreasing the force of friction	
20th	39	Simple problems on the above topics	
	40	<b>Unit-5-</b> Centre of Gravity , Concept, definition of centroid of plain figures	
21th	41	and centre of gravity of symmetrical solid bodies,	
	42	difference between centroid and C.G.	
22nd	43	Determination of centroid of plain and	<b>Practical-8-</b> To find out center of gravity of regular lamina <b>Practical-9-</b> To find out center of gravity of irregular
	44	composite lamina using moment method only,	

			lamina
23rd	45	centroid of bodies with removed portion	
	46	Determination of center of gravity of solid bodies - cylinder,	
24th	47	cube, cuboid and sphere; composite bodies and	
	48	bodies with portion removed [Simple problems on the above topics]	
25th	49	<b>Unit-6-</b> Simple Machines, Definition of Simple and	
	50	compound machine (Examples)	
26th	51	Definition of load, effort, velocity ratio, mechanical	
	52	advantage and efficiency of a machine	
27th	53	and their relationship, law of machines	
	54	Definition of ideal machine,	
28th	55	Reversible and self locking machine	
	56	Effort lost in friction, Load lost in friction,	
29th	57	Determination of maximum mechanical	
	58	Advantage and maximum efficiency	
30th	59	System of pulleys (first, second, third system of pulleys)	
	60	Determination of velocity ratio, mechanical advantage and efficiency,	
31th	61	Working principle and application of wheel and axle, Weston's Differential Pulley Block ,	<b>Practical-5-</b> To find the mechanical advantage, velocity ratio and efficiency of a screw jack
	62	simple screw jack, worm	
32nd	63	Worm wheel, single and double winch crab.	<b>Practical-6-</b> To find the mechanical advantage, velocity ratio and efficiency of worm and worm wheel <b>Practical-7-</b> To find mechanical advantage, velocity ratio and efficiency of single purchase crab
	64	Expression for their velocity ratio and field of their application[Simple problems on the above topics]	
33rd	65	<b>Revised Unit-4</b>	
	66	<b>Revised Unit-5</b>	
34th	67	<b>Revised Unit-6</b>	
	68	<b>Numerical Problems and its Solutions</b>	

<b>35th</b>	<b>69</b>	<b>Numerical Problems and its Solutions</b>	
	<b>70</b>	<b>Assessment –Final.</b>	