

Lesson Plan

Name of the Faculty : Manish Kumar

Discipline : Mech. Engg.

Year/Semester : 1st Year (Annual System)

Subject : **Applied Mechanics**

Lesson Plan duration : 37 weeks (18 Oct. 2021 – 30 June 2022)

Work load per week : Lecture – 02, Practical – 02

Week	Theory		Practical	
	Lecture	Topic (Including assessment/test)	Topic	
1 st	1 st	Introduction : Concept of engineering mechanics definition of mechanics	1 st	Introduction about the Lab and brief discussion over the practical work to be conducted
	2 nd	Statics, dynamics.		
2 nd	3 rd	Different systems of units (FPS, CGS, MKS and SI) and their conversion from one to another.	2 nd	Verification of the polygon law of forces using Gravesand's apparatus.
	4 th	Simple Numerical Problems, Fundamental Units and Derived Units		
3 rd	5 th	Concept of rigid body, scalar and vector quantities	3 rd	Verification of the polygon law of forces using Gravesand's apparatus.
	6 th	Laws of forces : Definition of force, Bow's Notations, types of force		
4 th	7 th	Point force/concentrated force & Uniformly distributed force, effects of force, characteristics of a force	4 th	Checking of Practical File
	8 th	Different force systems		
5 th	9 th	Principle of transmissibility of forces	5 th	To verify the forces in different members of jib crane.
	10 th	Law of super-position		
6 th	11 th	Composition and resolution of coplanar concurrent forces, resultant	6 th	To verify the forces in

		Force Method of composition of forces		different members of jib crane.
	12 th	Laws of forces, triangle law of forces		
7 th	13 th	Polygon law of forces - graphically, analytically, resolution of forces	7 th	Checking of Practical File
	14 th	Free body diagram		
8 th	15 th	Equilibrant force and its Determination	8 th	To verify the reaction at the supports of a simply supported beam.
	16 th	Lami's theorem		
9 th	17 th	Simple problems on above topics	9 th	To verify the reaction at the supports of a simply supported beam.
	18 th	1st Internal Assessment Exam		
10 th	19 th	Assessment	10 th	Checking of Practical File
	20 th	Moment : Concept of moment		
11 th	21 th	Moment of a force and units of moment	11 th	To find the mechanical advantage, velocity ratio and efficiency in case of an inclined plane.
	22 th	Varignon's theorem (definition only)		
12 th	23 th	Principle of moment and its Applications	12 th	To find the mechanical advantage, velocity ratio and efficiency in case of an inclined plane.
	24 th	Levers – simple and compound,		
13 th	25 th	Steel yard, safety valve, reaction at support)	13 th	Checking of Practical File
	26 th	Parallel forces (like and unlike parallel force) calculating their resultant		
14 th	27 th	Concept of couple, its properties	14 th	1st Internal Assessment Exam (Tentative)
	28 th	Effects of Couple		
15 th	29 ^h	General conditions of equilibrium of	15 th	To find the mechanical

		bodies under coplanar forces		advantage, velocity ratio and efficiency of a screw jack.
	30 th	Position of resultant force by moment		
16 th	31 th	Simple problems on the above topics	16 th	To find the mechanical advantage, velocity ratio and efficiency of a screw jack.
	32 th	Friction : Definition and concept of friction, types of friction		
17 th	33 th	Force of friction, Limiting Friction	17 th	Checking of Practical File
	34 th	Laws of static friction		
18 th	35 th	Coefficient of friction angle of friction, angle of repose	18 th	To find the mechanical advantage, velocity ratio and efficiency of worm and worm wheel
	36 th	Equilibrium of a body lying on a horizontal plane		
19 th	37 th	Equilibrium of a body lying on a rough inclined plane Ladder friction	19 th	To find the mechanical advantage, velocity ratio and efficiency of worm and worm wheel
	38 th	Advantages and Disadvantages of Friction Methods of increasing/decreasing the force of friction.		
20 th	39 th	Problems	20 th	Checking of Practical File
	40 th	2nd Internal Assessment Exam		
21 st	41 st	Centre of Gravity : Concept	21 st	To find mechanical advantage, velocity ratio and efficiency of single purchase crab.
	42 nd	Definition of Centroid of plain figures		
22 nd	43 rd	Centre of gravity of Symmetrical solid bodies	22 nd	To find mechanical advantage, velocity ratio and efficiency of single purchase crab.
	44 th	Difference between Centroid and C.G		
23 rd	45 th	Determination of Centroid of plain and composite lamina using moment method only	23 rd	Checking of Practical

	46 th	Centroid of bodies with removed Portion		File
24 th	47 th	Determination of center of gravity of solid bodies – Cylinder	24 th	To find out center of gravity of regular lamina.
	48 th	Determination of center of gravity of solid bodies - Cube,		
25 th	49 th	Determination of center of gravity of solid bodies Cuboid	25 th	To find out center of gravity of regular lamina.
	50 th	Determination of center of gravity of solid bodies Sphere		
26 th	51 st	Determination of center of gravity of composite bodies	26 th	Checking of Practical File
	52 nd	Determination of center of gravity of solid bodies with portion removed		
27 th	53 rd	Problems of above topic	27 th	2nd Internal Assessment Exam (Tentative)
	54 th	Simple Machines : Definition of Simple and compound machine (Examples)		
28 th	55 th	Definition of load, effort, velocity ratio, mechanical advantage	28 th	To find out center of gravity of irregular lamina
	56 th	Efficiency of a machine and their relationship, law of machines		
29 th	57 th	Definition of ideal machine, reversible and self locking machine	29 th	Checking of Practical File
	58 th	Effort lost in friction, Load lost in friction.		
30 th	59 th	Determination of maximum mechanical advantage and maximum efficiency	30 th	To find out center of gravity of irregular lamina
	60 th	System of pulleys (first, second, third system of pulleys)		
31 st	61 st	Determination of velocity ratio, mechanical advantage and efficiency	31 st	Checking of Practical File
	62 nd	Working principle and application of wheel and axle		
32 nd	63 rd	Weston's Differential Pulley Block	32 nd	To determine coefficient of friction between three pairs of given surface
	64 th	Simple screw jack		

33 rd	65 th	Worm and worm wheel	33 rd	Checking of Practical File
	66 th	Single and double winch crab.		
34 th	67 th	Expression for their velocity ratio and field of their application of above m/c	34 th	To determine coefficient of friction between three pairs of given surface
	68 th	Numerical Problems of MA and Efficiency		
35 th	69 th	Numerical problems of effort lost	35 th	Checking of Practical File
	70 th	Numerical problems of load lost.		
36 th	71 st	Numerical problems of pulley 1 st and 2 nd systems to calculate V.R, M.A and efficiency	36 th	Internal Viva
	72 nd	Numerical problems of 3 system pulley systems to calculate V.R, M.A and efficiency		
37 th	73 rd	Revision	37 th	Internal Viva
	74 th	Revision		