

Course Plan			
Module	Contents	Hours	Sem. Exam Marks
I	Statics: Fundamental concepts and laws of mechanics – Rigid body – Principle of transmissibility of forces	2	15%
	Coplanar force systems - Moment of a force – Principle of moments	2	
	Resultant of force and couple system	4	
	Equilibrium of rigid body – Free body diagram – Conditions of equilibrium in two dimensions – Two force and three force members.	3	
II	Types of supports – Problems involving point loads and uniformly distributed loads only.	5	15%
	Force systems in space – Degrees of freedom – Free body diagram – Equations of equilibrium – Simple resultant and Equilibrium problems.	4	
FIRST INTERNAL EXAM			
III	Properties of planar surfaces – Centroid and second moment of area (Derivations not required) - Parallel and perpendicular axis theorem – Centroid and Moment of Inertia of composite area.	3	15%
	Polar Moment of Inertia – Radius of gyration – Mass moment of inertia of cylinder and thin disc (No derivations required).	2	
	Product of inertia – Principal Moment of Inertia (conceptual level).	3	
	Theorems of Pappus and Guldinus.	1	
IV	Friction – Characteristics of dry friction – Problems involving friction of ladder, wedges and connected bodies.	6	15%
	Definition of work and virtual work – Principle of virtual work for a system of connection bodies – Problems on determinate beams only.	4	
SECOND INTERNAL EXAM			
V	Dynamics: Rectangular and Cylindrical co-ordinate system	1	20%
	Combined motion of rotation and translation – Concept of instantaneous centre – Motion of connecting rod of piston and crank of a reciprocating pump.	4	
	Rectilinear translation – Newton’s second law – D’Alembert’s Principle – Application to connected bodies (Problems on motion of lift only).	4	
VI	Mechanical vibrations – Free and forced vibration - Degree of freedom.	1	20%
	Simple harmonic motion – Spring-mass model – Period – Stiffness – Frequency – Simple numerical problems of single degree of freedom.	7	
END SEMESTER EXAM			