

University of Mumbai

CLASS :F.E(All Branches of Engineering)		Semester-I	
SUBJECT:Engineering Mechanics			
Periods per week (1 Period of 60 min.)	Lecture	5	
	Practical	2	
	Tutorial	--	
		Hours	Marks
Evaluations System	Theory Examination	3	100
	Practical	2	25
	Oral Examination	--	--
	Term Work	--	25
	Total		150

Details of Syllabus:

Sr. No.	Topics	Hrs
01	1.1.System of Coplanar forces:- Resultant of concurrent forces, Parallel forces, Non Concurrent Non Parallel system of forces, Moment of Force about any point, Couples, Varignon's Theorem Distributed Forces in plane.	05
	1.2. Introduction to Centroid & Center of Gravity, Introduction to Moment of Inertia & its theorem.	05
02	2.1. Equilibrium of system of coplanar forces:- Condition of equilibrium for concurrent forces, Parallel forces & Non concurrent Non Parallel general forces & couples.	06
	2.2. types of support, loads , Beams, Determination of reactions at supports for various types of loads on beams.	04
	2.3. Analysis of plane trusses by using method of Sections & Method of Joints.	04
03	3.1. Friction: Introduction to Laws of Friction, Cone of friction, Equilibrium of bodies on inclined plane, Application to problems involving wedges, ladders, screw friction.	05
	3.2. Belt Friction: transmission of power by belts& ropes, centrifugal & initial tension in the belts or ropes. Condition of maximum power transmission, Flat belt & flat pulleys & ropes on grooved pulleys.	05
04	4.1. Kinematics of Particle:- Velocity & acceleration in terms of rectangular co-ordinate system, Rectilinear motion, Motion along plane curved path, Tangential & Normal component of acceleration, Motion Curves (a-t, v-t,s-t Curves) , Projectile motion, Relative velocities.	10
05	5.1. Kinematics of Rigid Bodies:- Introduction to general plane motion,	06

	Instantaneous center of rotation for the velocity, velocity diagrams for bodies in plane motion,(up to 2 linkage mechanism)	
06	6.1. Kinetics of particles:- Introduction to basic concepts, Newton's second law, work energy principles, equation of dynamic equilibrium.	06
	6.2. Moment of Energy Principles:- linear momentum, principles of conservation of momentum, Impact of Solid bodies, semi elastic impact & plastic impact.	04

Theory Examination:

1. Question paper will be comprising of total 7 questions , each of 20 marks.
2. Only 5 questions need to be solved.
3. Q.1 should be compulsory and based on entire syllabus.
4. Remaining questions will be mixed in nature. (e.g. Suppose q.2 has part (a) from , module 3 then part (b) will be from any module other than module 3)
5. In question paper weightage of each module will be proportional to number of respective lecture hrs as mentioned in the syllabus.

Practical & oral examination :-

Practical & oral examination will be based on one experiment performed from the list of experiment given in the syllabus and the oral will be based on the same experiment.

Term work:-

Term work shall consist of minimum 6 experiments , assignments consisting numericals based on above syllabus and a written test.

The distribution of marks for term work shall be as follows:

Laboratory work(Experiments/programs and journal)	:10 marks
Test (at least one)	:10 marks
Attendance (Theory and Practical)	:05 marks

The final certification and acceptance of term work ensures the satisfactory performance of laboratory work and minimum passing in the term work.

List of Experiments:

1. Polygon law of coplanar forces.
 2. Non concurrent non parallel(general)
 3. Bell crank lever
 4. Support reaction for beam
 5. Simple / compound pendulum
 6. Inclined plane (to determine coefficient of friction)
 7. Collision of elastic bodies(Law of conservation of momentum)
 8. Moment of inertia of fly wheel
 9. Screw friction by using screw jack.
- Any other experiment based on above syllabus.

Recommended Books:

1. Engineering Mechanics by R.C.Hibblar, Mac Millan

2. Engineering Mechanics by B.N.Thandani, Weinell book corporation
3. Engineering Mechanics by Beer & Johnson , Tata McGraw Hill
4. Engineering Mechanics by F.L.Singer, harper & Row publication
5. Engineering Mechanics by Mcklin & Nelson, Tata McGraw Hill
6. Engineering Mechanics by Shaum Series
7. Engineering Mechanics by Tayal, Umesh publication
8. Engineering Mechanics by Kumar, Tata McGraw Hill