

Dynamics

Subject Code	Subject	Credit/Hrs. per week	Duration of University Exam	Marks		Total Marks
				CIA	External Exam	
UM601	Dynamics	4/5	3 hours	40	60	100

Objectives:

- To give an in-depth knowledge of Kinematics, Laws of Motion
- To study the Projectile, Impulsive forces and Collision of Elastic bodies ,SHM and their Applications.

Unit – I

Kinematics: Speed – Displacement – Velocity -Relative Velocity -Angular velocity–Relative Angular velocity- Acceleration – Constant acceleration-Variable acceleration –Acceleration of falling bodies, Vertical motion under gravity, Bodies freely falling downward.

Unit-II

Introduction-Momentum-Newton's Laws of Motion-Motion of a connected particles -Work-Power-Energy -Limiting velocity in a resisting medium-Resistance proportional to the speed-Resistance proportional to the square of the speed

Unit – III

Projectiles: Definitions – Two fundamental principles – Path of a projectile is a parabola – Characteristics of the motion of a projectile – Horizontal Range of projection – Velocity of projectile- Time of flight -Range on an inclined plane -Motion on the surface of smooth inclined plane.

Unit – IV

Impulsive Forces: Impulse – Impulsive Force – Impact of two bodies – Loss of Kinetic energy in impact- motion of a shot and Gun —Impact of water on surface-Collision of elastic bodies: Definitions – Fundamental Laws of Impact – Impact of a smooth sphere on a fixed smooth plane – Direct impact of two smooth spheres – Oblique impact of two smooth spheres.

Unit – V

S.H.M in a straight line – General solution of the S.H.M. equation – Geometrical representation – Change of origin-Composition of two S.H.M of the same period and in the same straight line,

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in two perpendicular directions-Motion of a particle suspended by a spiral spring-Horizontal oscillations of a particle tied to an elastic spring – S.H.M. on a curve – simple pendulum – period of oscillation of a simple pendulum – equivalence simple pendulum – seconds pendulum – loss or gain in the number of oscillation made by a pendulum.

Text Book:

Dr. M.K. Venkataraman, 2004, A Text Book of Dynamics (Eleventh Edition), Agasthiar Publications, Tiruchy.

Unit-I - (Chapter – III ,Sections 3.1 to 3.31)

Unit-II-(Chapter IV , Sections 4.1 to 4.36 & Chapter V, Sections 5.1 to 5.6)

Unit-III-(Chapter VI (Sections 6.1 to 6.16)

Unit-IV-(Chapter – VII (Sections 7.1 to 7.6), Chapter – VIII (Sections 8.1 to 8.9))

Unit-V-(Chapter – X (Sections 10.1 to 10.16)

Reference Books:

1. Narayanan. S., 1986, Dynamics, Sultan Chand and co., Chennai.
2. Mechanics-P.Duraipandian and others, S.chand and co.
3. Dynamics-K.Viswanathanaik and M.S.Kasi, Emerald publishers.
4. Dynamics-A.V. Dharmapadam,S.Viswanathan publishers.