SRM UNIVERSITY
(Under section 3 of UGC Act 1956)

Course Code	Course Name	L	T	P	C
MAT1263	Mechanics	4	1	0	4

INSTRUCTIONAL OBJECTIVES:

At the end of the course the students should be able to

- Understand in detail, simple harmonic motion
- Be familiar with the characteristic of elasticity
- Study, in detail, motion of a projectile
- Be familiar with central forces and orbit
- Be thorough with motion of a rigid body

UNIT I **12 hours**

Rectilinear motion: Simple harmonic motion – Composition of two simple harmonic motions – Motion under gravity in a resisting medium – Resistance varying as the velocity and as the square of the velocity.

UNIT II **12 hours**

Impact: Definition of impulsive forces and impulse – Principle of conservation of linear momentum – Elasticity – Collision of two smooth spheres – change in kinetic energy and impulse imparted due to collision – Impact of a smooth sphere on a fixed smooth plane.

UNIT III **12 hours**

Motion of a projectile: Motion of a projectile, nature of a trajectory – Range on a horizontal plane – Range on an inclined plane – Moment of inertia of simple bodies – Perpendicular and parallel axis theorems (Statement only)

UNIT IV **12 hours**

Central orbit: Central forces and central orbit – Orbit as a plane curve – Differential equation of the central orbit in polar co-ordinates – Given a central orbit, to find the law of force and the speed of any point – to obtain the nature of the orbit when the central force is M/r^2 and M/r only.

UNIT V **12 hours**

Motion of a rigid body: Two dimensional motion of a rigid body – motion about a fixed axis – Kinetic energy – Moment of momentum – Moment of the effective forces about the fixed axis.

TEXT BOOK

1. P. Durai Pandian, Mechanics, S. Chand & Company Ltd., 2012.
   Unit I: Chapter 5 : 5.1, 5.3, 5.6, 5.7; Unit II: Chapter 12 : 12.1 – 12.7; Unit III: Chapter 13: 13.1 – 13.8; Unit IV: Chapter 15: 15.1 – 15.5; Unit V: Chapter 17: 17.1 – 17.3.

REFERENCES

1. A.V. Dharmapadam, Mechanics, S. Viswanathan and Co., 2011.

2. M. K. Venkatraman, Statics, National Publishing co., 2012.
3. K. V Nailk and M. S. Kasi, Statics, Emerald publishing co.