Course Type	Course Code	Name of Course	L	T	P	Credit
DE	**NMCD519**	Classical Mechanics	3	0	0	3

Prerequisite
● Differential Equations, Linear Algebra.
Course Objective
● To develop ability to understand concepts of classical mechanics to apply methods used in the study to solve real world models.
Learning Outcomes
Mastery of the Lagrangian theory, Kinematics of Rigid Body Motion, Hamilton-Jacobi Theory, Classical Chaos and Canonical Perturbation Theory.

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
1	Survey of the Elementary Principles, Variational Principles and Lagrange's Equations, The Central Force Problem.	9	Students will understand the Variational Principles and Lagrange's Equations, and The Central Force Problem.
2	The Kinematics of Rigid Body Motion, The Rigid Body Equations of Motion, Oscillations.	9	Students will be able to understand the Kinematics of Rigid Body Motion and Oscillations.
3	The Classical Mechanics of the Special Theory of Relativity.	6	Students will learn the laws of Classical Mechanics concerned with Special Theory of Relativity.
4	The Hamiltonian Equations of Motion, Canonical Transformations, Hamilton-Jacobi Theory and Action Angle Variables	9	Will enable students to derive the Hamiltonian Equations of Motion. Also will help to understand the Canonical Transformations and Hamilton-Jacobi Theory.
5	Classical Chaos, Canonical Perturbation Theory, Introduction to Lagrangian and Hamiltonian Formulations for Continuous Systems and Fields.	9	Students will learn the concept of classical Chaos. They will also understand the canonical perturbation theory. To learn the Lagrangian and Hamiltonian Formulations for Continuous Systems and Fields.
Total		**42**	

Text Books:

1. Classical Mechanics (Third Edition) by Goldstein, Poole & Safko; Addison-Wesley, 2002, 2. Classical Mechanics by John R. Taylor (University Science Books, 2005)

Reference Books:

1. Classical Dynamics by Jose & Saletan; Cambridge University Press, 1998.

2. Classical Mechanics by Matthew J. Benacquista, Joseph D. Romano,Springer, 2018.