Code	Subject Title		Cr. Hrs	Semester
PHY-301	Classical Mechanics		3	V
Year	**Discipline**			
3	Physics			

Historical development of classical mechanics, Newtonian mechanics and its limitations, Lagrangian formulation in generalized coordinates, calculus of variation, Hamilton's principle, Lagrange's equation, space time symmetries and conservation laws, homogeneity and isotropy, cyclic coordinates, integrals of motion.

Central force, two-body central problem, Kepler's problem, planetary orbits and their equations, perturbation of orbits.

Legendre's transformation, Hamiltonian and Hamilton's equations of motion, Routhian, configuration space, phase space and state space.

Canonical transformations and their properties, canonical transformation of the free particle Hamiltonian, Poisson brackets and their properties, Poisson's theorems, invariance of Poisson's brackets under canonical transformations.

Books Recommended:
1. *Classical Mechanics* by H. Goldstein, Addison-Wesley, Reading, 1950.
2. *Mechanics* by L. D. Landau and E. M. Lifshitz, , Pergamon ,Oxford. 1960.
3. *Classical Mechanics* by J. W. Leech Methuen and Co. Ltd., London, 1958.
4. *Classical Mechanics* by V. D. Barger and M. G. Olsson, McGraw-Hill, New York, 1995.
5. *Analytical Mechanics* by L. N. Hand and J. D. Finch, Cambridge University Press, Cambridge, 1998.