1.	Title of the Course	Introduction to Classical Mechanics
2.	Course Number	PH1101
3.	Status of the Course	Core
4.	Structure of Credits	2-1-0-3
5.	Offered To	UG
6.	New Course/Modification to	Modification To PH1101
7.	To be Offered by	Department of Physics
8.	To take effect from	January 2020
9.	Prerequisite	Nil
10.	Whether approved by the Department	Yes
11.	**Course Objective:** To provide fundamental concepts and application techniques of Newtonian mechanics employing rigorous methods of vector calculus which lay the foundation of fluid mechanics and electromagnetic phenomena. To deal with non-inertial frames and develop a handle on techniques such as GPS systems, etc.	
12.	**Course Content:** Causality and determinism in Newton's laws, symmetry and conservation laws; Equations of motion in polar coordinate systems; Non-inertial frames: centrifugal, Coriolis and leap-second terms in a rotating frame; Rigid body dynamics; Gradient operator; Oscillations: simple, damped and driven oscillators, resonances; Non-linear terms and Chaos, Hausdorff-Besicovitch dimension, Mandelbrot set; Central forces, satellite orbits, Laplace-Runge-Lenz dynamical symmetry, effective radial potential in Kepler-Newton problem; Fluid Mechanics: flux and divergence of a force-field, Gauss' theorem, equation of continuity, Lagrange and Eulerian descriptions of fluid flow, circulation and curl of a vector field, Stokes' theorem, fluid flow, Bernoulli's principle.	
13.	**Text book(s):** 1. Deshmukh P C, *Foundations of Classical Mechanics*, ,Cambridge University Press (2019). 2. Morin D, *Introduction to Classical Mechanics with problems and solutions*, ,Cambridge University Press (2008).	
14.	**Reference(s):** 1. Fowles G R and Cassiday G L, *Analytical Mechanics*, Saunders Golden Sunburst Series (2004). 2. Kittel C, Knight W, Ruderman M, Helmholz C and Moyer B, *Mechanics: Berkeley Physics Course*, McGraw Hill Education (2017). 3. Kleppner D and Kalikow R, *An Introduction to Mechanics*, McGraw Hill Education (2017). 4. Tél T, Gruiz M and Kulacsy K, *Chaotic dynamics: An introduction based on classical mechanics*, Cambridge University Press (2006).	