Syllabus of PH1010

PH1010 Physics I 2L+1T

Module 1: Newton's Laws of Motion
Vectors in mechanics, Vectors and time derivatives of vectors. Coordinate transformations, Transformation properties of vectors, axial and Polar vectors. Motion Plane Cylindrical, and spherical polar coordinates systems.

Module 2: Introduction to physics of fields
Conservative vector fields. Gradient and equipotentials. Equilibrium and critical points.

Module 3:
Introduction to phase space and phase trajectories; equilibrium and stability, small oscillations, forced and dissipative oscillations.

Module 4:
Motion in a central potential and conservation of angular momentum. Kepler problem: Effective potential for the radial problem. Kepler's laws (planetary motion), satellite orbits.

Module :6
Concepts of divergence and Gauss' a thorem. Curl and Stokes theorem and applications. Divergence and Curl in Cylindrical and Spherical and Coordinate systems.

Text books:

1. Daniel Kleppner and Robert Kolenkow , An Introduction to Mechanics, TMH, (2007)
2. David Morin, Introduction to Classical Mechanics, with problems and solutions, Cambridge Univ. Press (2008).
3. D. J. Griffiths, Introduction to Electrodynamics, PHI Learning, (2012).

References:

1. J R Taylor, Classical Mechanics, University Science Books (2004).
2. C. Kittel, W. Knight, M. Ruderman et. al., Mechanics (Berkeley Physics Course, Vol. 1) McGraw Hill Education (India) Pvt. Ltd. (2011).
3. E. M. Purcell and J. Morin, Electricity and Magnetism (Berkeley Physics Course, Vol. 2), Cambridge University Press(2013)
4. Feynman R.P., Leighton R.B. and Sands M. (Narosa), The Feynman Lectures of Physics (Vol.1.), Narosa Publishing House (2008).