Semester I

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
Engineering Physics I, GE-1	4	2	0	2	Class XII pass	Science Till Class X	Physics Faculty of CIC

Learning Objectives

This interactive learning module intends to provide basic theoretical understanding of Classical Mechanics with special emphasis on learning how these theoretical concepts are applied in designing mechanical and energy efficient systems etc.

Learning outcomes

- Understanding of physics principles in machines.
- Ability to conceptualize and build machines for real life use.
- Reverse engineering of mechanical devices and redesigning of such objects.
- Practical hands-on skills and understanding of simple engineering concepts derived from Mechanics.

SYLLABUS OF GE-1

UNIT – I (16 Hour)
Classical mechanics at work

Newtonian Mechanics (Kinematics & Dynamics) - Classical Mechanics at work - deconstructing mechanical systems - Universal Gravitation

UNIT – II (16 Hour)
Oscillation & Rotation

Oscillations - Inertial & Non-inertial frames - Central force motion - Understanding rotational dynamics

UNIT – III (16 Hour)
Machines

Efficiency and mechanical advantage in simple and complex machines: Levers, Pulley, Wheel & Axles, Gear systems, Hydraulic systems

UNIT – IV (16 Hour)
Energy Applications

Forms of energy and conversion between different forms of energy.

Practical component –

Engineering Kitchen Activities [Laboratory]

- Concepts of measurement, error, precision, accuracy. Concept of scale. Understanding Measuring Instruments
- Understanding oscillation using simple and compound pendulums
- Mechanics system with 850 Universal Interface – understanding Newtonian Dynamics
- Measurement of Moment of inertia from rotational dynamics
- Roller coaster dynamics – computer simulation and physical verification
- Coupled pendulum motion – using webcam and image analysis
- Ballistic Pendulum
- Understanding physics of complex machines – one implementation of "Tod-Phod-Jod" concept.
- Visualization in 3D and understand how things work – Building a CAD model in 3D to trace the flow of power, energy, information and material.
- Innovation project – designing instruments, machines, prototypes, applets

Essential/recommended readings

1. *Classical Mechanics*. Herbert Goldstein, Pearson Education, 2011.
2. *A Textbook of Machine Design*. R. S. Khurmi, and J. K. Gupta, S. Chand Publishing, 2005.

GENERIC ELECTIVES (GE-2): Engineering Chemistry I

Credit distribution, Eligibility and Pre-requisites of the Course

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course	Department offering the course
		Lecture	Tutorial	Practical/ Practice			
Engineering Chemistry I, GE-2	**04**	**2**	**0**	**2**	**Class XII pass**	**Science Till Class X**	**Chemistry Faculty of CIC**

Learning Objectives

This course is designed in such way, so that it provides a flavor of interesting, innovative, programmable and multifunctional materials of chemistry. Students