INSTITUTE	**FACULTY OF SCIENCE**
PROGRAM	**BACHELOR OF SCIENCE (CHEMISTRY)**
SEMESTER	**1**
COURSE TITLE	**FUNDAMENTALS OF PHYSICS**
COURSE CODE	**02PY0105**
COURSE CREDITS	**4**

Objective:

1 To be able to apply the fundamental laws of motion, Rotational motion, Simple Harmonic Motion (SHM), Gravitation and their applications in various scientific fields

2 To be able to apply the fundamental laws of motion, Rotational motion, Simple Harmonic Motion (SHM), Gravitation and their applications in various scientific fields.

Course Outcomes: After completion of this course, student will be able to:

1 Apply knowledge of fundamental laws of physics to solve scientific problems.

2 Apply knowledge of rotational motion and SHM to solve problems of dynamics.

3 Apply knowledge of Gravitation in field of space science.

4 Understand the correlation between natural phenomena and theory in building the basic concepts of modern physics.

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
4	0	0	50	30	20	0	0

Contents : Unit	Topics	Contact Hours
1	**Vector analysis and Laws of motion** Concept of scalar and vector, Adding Vectors Geometrically, Components of vectors, Unit vectors, Adding Vectors by Components, Vectors and the laws of physics, Multiplying Vectors. Newtonian Mechanics, Newton's First Law of Motion, Force, Mass, Newton's Second of Motion, Some Particular Forces, Newton's Third Law of Motion, Applying Newton's third law.	15
2	**Rotational Motion** The Rotational variables, Relating the linear and Angular variables, Kinetic energy of Rotation, Angular momentum, Calculating rotational Inertia, Torque, Newton's Second law for Rotation, Conservation of Angular Momentum, Precession of a Gyroscope, Rolling as Translational and Rotation Combined.	15

DR. PRAKASH VASHRAMBHAI KANJARIYA
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DR. KANTHA DEVI ARUNACHALAM
Digitally signed by (Name of Dean/ Principal)

Contents : Unit	Topics	Contact Hours
3	**Gravitation** Newton's laws of Gravitation, Gravitation and the principle of Superposition, Gravitation near Earth's surface, Gravitation inside Earth, Gravitational Potential Energy, Planets and Satellite, Kepler's laws, Satellite Orbits and Energy, Einstein and Gravitation.	15
4	**Simple Harmonic Motion** Simple Harmonic Motion, The force law for Simple Harmonic Motion, Energy in Simpler Harmonic Motion, An Angular simple Harmonics Oscillator, Pendulums, Simple Harmonic Motion and /Circular Motion, Damped Simple Harmonic Motion, Forced Oscillations and Resonance.	15
Total Hours		**60**

Textbook :

1 Principles of Physics, Halliday, Resnick and Walker, Wiley Publication, 2015

References:

1 SEARS AND ZEMANSKY'S University Physics with Modern Physics , SEARS AND ZEMANSKY'S University Physics with Modern Physics , H. D. Young and R. A. Freedman, Pearson Publication , 2012

2 Lectures on Physics , Lectures on Physics , Feynman, Pearson Publication , 2009

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
20.00	30.00	25.00	15.00	10.00	0.00

Instructional Method:

1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.

3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

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Digitally signed by (Name of HOD)

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Supplementary Resources:

1 https://www.feynmanlectures.caltech.edu/

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