DEPARTMENT OF PHYSICS

Bsc Physics

Course Outcomes

Title Of Paper	METHODOLOGY OF SCIENCE AND PHYSICS
Course Code	PH1 B01
Credits	2
Total Hours	36

This course provides the student with

CO1: A general idea about what is science, what is scientific temper,history of science and scientific revolutions

CO2. Familiarity with the different steps involved in the scientific method with the help of a flow chart, explaining what is hypothesis and how they become scientific laws

CO3. Awareness of a brief history of physics, giving emphasis on the birth of quantum theory using black body radiation, photoelectric , X rays and DeBroglie waves and a general idea about theory of relativity

CO4: Introduction to mathematical methods physicists often use, including differential Calculus,The operator ∇- Gradient, Divergence, Curl, integral calculus, matrices and curvilinear coordinates

Title Of Paper	PROPERTIES OF MATTER, WAVES & ACOUSTICS
Course Code	PH2 B02
Credits	2
Total Hours	36

After successful completion of the course, the student is expected to

Co1: Learn the basics of properties of matter, how Young's modulus and rigidity modulus are defines and how they are evaluated for different shapes of practical relevance

Co2: Learn the fundamentals of harmonic oscillator model, including damped and forced oscillators and grasp the significance of terms like quality factor and damping coefficient

Co3.Study the general equation of wave motion in general and TM waves in stretched strings and longitudinal waves in gases

Co4.Familiarise with general terms in acoustics like intensity, loudness, reverberation etc, and study in detail about production, detection, properties and uses of ultrasonic waves.

Title Of Paper	MECHANICS
Course Code	PH3 B03
Credits	4
Total Hours	56

On successful completion of the course students would have

CO1: Grasped the fundamentals of different types of frames of references and transformation laws-Both Galilean and Lorentz

CO2. Learned conservation laws of energy and linear and angular momentum and apply them to solve problems

CO3. Learn the basics of potentials and fields, central forces and Kepler's laws

CO4.Familarise with Lagrangian and Hamiltonian formulations of classical mechanics

CO5. Fundamental ideas of special theory of relativity such as length contraction and time dilation and mass –energy invariance

Title Of Paper	**ELECTRODYNAMICS I**
Course Code	PH4B04
Credits	4
Total Hours	54

After successful completion of the course, the student is expected to :

C01: Have gained elaborated knowledge about electrostatics and laws governing the charge distribution

C02:Have gained ability to apply Laplace equation for calculating potentials.

C03:Study in depth about Polarization, bound charges and boundary condition.

C04:To realize the importance of application of Biot Savarts Law and Amperes law.

C05:To understand the relevance of different magnetization and the boundary condition of magnetic field.

Title of the paper	**ELECTRODYNAMICS II**
Course Code	**PH5B06**
Credits	**3**
Total Hours	**54**

After successful completion of the course, the student is expected to :

C01 :be able to solve a variety of problems related to Faraday's law of induction and Maxwell's equations. Student is expected to explain term displacement current as well.

C02 :understand the relevance of displacement current in the context of electromagnetic wave propagation.

C03 :study in depth the transient current response of CR, LC, CR and LCR circuits, which is essential in designing as well as understanding the working of electronic circuits.

C04:solve complex problems involving linear electrical networks employing the symmetry concepts together withvarious network theorems

Title of the paper	QUANTUM MECHANICS
Course Code	PH5 BO7
Credits	3
Total Hours	54

After successful completion of the course, the student is expected to:

C01: To become familiar with Blackbody radiation, Ultraviolet catastrophe,PhotoElectric effect and Compton Effect and hence be aware how quantum theory emerged

C02:Have gained a clear knowledge about wave properties of particles,De Broglie waves and its implications on theuncertainty principle.

C03: Study the Bohr Atom model in detail and understand about atomic excitations

C04:Have grasped the idea of Wave Mechanics and gain the concept of eigen values, eigen functions and learn the basic postulates of quantum mechanics

C05:To find solution to Schrödinger's equation for many systems such as particle in a box, Hydrogen Atom and familiarize with different quantum numbers.

Title of the paper	PHYSICAL OPTRICS AND MODERN OPTICS
Course Code	PH5BO8
Credits	3
Total Hours	54

On successful completion of the course students will be able to:

C01. Understand the basics of the Matrix method to solve problems of geometrical optics

C02. Use the principles of wave motion and superposition to explain the physics of polarisation, interference and diffraction.

C03. Understand the basics of modern optics like Fiber optics and holographyC04. Solve problems in optics by selecting the appropriate equations and performing numerical or analytical calculations.

Title of the paper	ELECTRONICS (ANALOG & DIGITAL)
Course Code	PH5BO9
Credits	4
Total Hours	72

After successful completion of the course, the student is expected to

CO1have a basic knowledge of semiconductor physics

CO2 acquire knowledge about how a semiconductor diode rectifies an input ac signal

CO3 Learn how to construct a transistor amplifier and how its gain varies with frequency

CO4 know about various number systems and their applications , flip flops and counters

Title of the paper	THERMAL AND STATISTICAL PHYSICS
Course Code	PH5B10
Credits	4
Total Hours	72

After successful completion of the course, the student is expected to

C01:Become familiar with various thermodynamic process and work done in each of these process.

C02:Have a clear understanding about Reversible and irreversible process and also working of a Carnot engine, and   knowledge of calculating change in entropy for various process.

C03:Realize the importance of Thermo dynamical functions and applications of Maxwell's relations.

C04: Familiarize in depth about statistical distribution and have basic Ideas about Maxwell-boltzman,Bose-Einstein and Fermi Dirac Statistics and their applications

Title of the paper	SOLID STATE PHYSICS,SPECTROSCOPY AND LASER PHYSICS
Course Code	PH6B11
Credits	4
Total Hours	72

After successful completion of the course, the student is expected to :

C01:Have a clear picture of crystal structures and a clear understanding about x-ray diffraction

C02:Expected to gain knowledge of superconductivity,,its underlying principles and its applications in modern world

C03:Become familiar with molecular spectroscopy and have gained basic ideas regarding microwave spectroscopy, infrared spectroscopy and Raman Spectroscopy.

C04:Have gained basic knowledge of laser and working of different type of lasers

Title of the paper	NUCLEAR PHYSICS, PARTICLE PHYSICS AND ASTROPHYSICS
Course Code	PH6B12
Credits	4
Total Hours	72

After successful completion of the course, the student is expected to :

C01:Gain a clear picture of nuclear composition and various nuclear models.

C02:Have a deep knowledge about Radio activity,nuclear Fission and Nuclear Fusion,the relevance of nuclear transformation.

C03:Understand the working of nuclear detectors and counters,realize the importance of Cosmic rays and its effects on earth

C05:Become familiar with nuclear particles and different particle accelerators. Student is expected to know the working of different accelerators.

C06:Have Peripheral ideas about astronomy and astrophysics

OPEN COURSES OFFERED BY PHYSICS DEPARTMENT

Objective
To develop scientific temper and attitude in students from other streams.

Title of the paper	NON CONVENTIONAL ENERGY SOURCES
Course Code	PH5 DO1 (1)
Credits	2
Total Hours	50

Since the course does not require a solid base in physics, the student is only expected to develop

CO1: Qualitative ideas about Solar energy, Physical principle of conversion of solar energy into heat energy, solar energy harvesting devices like solar cells, solar cookers, solar greenhouses etc

CO2   Gets an idea about basic principle of wind energy conversion and basic components of wind energy conversion systems

CO3 Elementary idea of Geothermal energy sources, its applications and method of obtaining energy from biomass

CO4.   Know about other non-conventional energy sources like Ocean Thermal Energy Resources, Wind energy and Chemical energy resources

BSc   Physics Complimentary

Title of the paper	COMPLIMENTARY COURSE- OPTICS, LASERS, ELECTRONICS AND COMMUNICATION
Course Code	PH3C03
Credits	2
Total Hours	54

After successful completion of the course, the student is expected to :

C01 : To have developed the idea of interference, diffraction and polarization and to solve problems related to the phenomena

C02 : understand about different laser systems and its applications

C03 : study about Basics electronics Technology

C04 : Realize the importance of different electronic communication systems.