

DEPARTMENT OF PHYSICS
M.Sc. PHYSICS (Five Year Programme)

19IPHYC14 - Properties of Matter

Course Outcomes:

CO1: Acquire a practical knowledge about the gravity and the applications of the laws of gravitation.

CO2: Understand and apply the concept of elasticity.

CO3: Understand the behaviour of fluids and practical applications of the same in real life.

CO4: Recall the principles and basic equations and apply them to unseen problems

19IPHYC24 - Heat and Thermodynamics

Course Outcomes:

CO1: Gain in depth knowledge of heat and its effects.

CO2: Understand the behavior of thermal properties of materials.

CO3: Know the theory of heat and thermodynamics with applications.

CO4: Finding applications of the physical quantities.

19IPHYC25 - Practical – I

Course Outcomes:

CO1: Apply knowledge of physics fundamentals and an instrumentation to arrive solution for various problems.

CO2: Understand the usage of basic laws and theories to determine various properties of the materials given.

CO3: Understand the application side of the experiments

CO4: Use of basic laws to study the thermal properties of materials.

19IPHYC33 – Mechanics

Course Outcomes:

CO1: Understand and define the laws involved in mechanics.

CO2: Understand the concepts of projectile motion, impulse and impact.

CO3: Understand the rockets and satellites and its importance for scientific developments.

CO4: **Understand** the concepts of dynamics of rigid bodies and the knowledge about static, centre of gravity, hydrodynamics and basic ideas of classical mechanics.

19IPHYC 34 - Oscillations, Waves and Acoustics

Course Outcomes:

CO1: Thorough understanding about the terms such as frequency, wavelength and amplitude

CO2: Involving personally doing the sonometer experiment and determining the frequency of a given tuning fork

CO3: Having personal experience in identifying the difference between the reverberation, and reflection of sound waves or echo.

CO4: Gain deeper understanding of ultrasonics and its applications.

19IPHYC 35 - Practical –II

Course Outcomes:

CO1: Apply knowledge of physics fundamentals and an instrumentation to arrive solution for various problems.

CO2: Understand the usage of basic laws and theories to determine various properties of the materials given.

CO3: Understand the application side of the experiments

CO4: Use of basic laws to study the spectral properties and optical properties of the given prism.

19IPHYC43 - Optics and Spectroscopy

Course Outcomes:

CO1: Understand and acquire an in-depth knowledge regarding the behaviour of light and also the essential concepts of geometrical optics.

CO2: Understand the phenomenon of interference, diffraction and polarization.

CO3: Use of tools needed to formulate problems in optics and spectroscopy.

CO4: Understand the fundamental aspects of molecular spectroscopy.

19IPHYC44 - Electricity and Magnetism

Course Outcomes:

CO1: Recognize basic terms in electricity and magnetism.

CO2: Basic of electrostatics and magnetostatics can be very well understood.

CO3: Concepts of e.m.theory could be enlightened.

CO4: Various equipments (B.G,transformers, thermocouples) principles and working are very well perceived.

19IPHYC45 - Practical – III

Course Outcomes:

CO1: Apply knowledge of physics fundamentals and an instrumentation to arrive solution for various problems.

CO2: Understand the usage of basic laws and theories to determine various properties of the materials given.

CO3: Understand the application side of the experiments

CO4: Acquire in depth knowledge regarding the basic concepts in electricity and magnetism.

19IPHYC51 - Atomic Physics

Course Outcomes:

CO1: Explain the concept of discharge of electricity through the gases.

CO2: Describe the various atomic model and fine structure of spherical lines.

CO3: Understand the photoelectric effect and its important applications.

CO4: Understand the central concepts of X-ray production, properties and theory.

19IPHYC52 - Lasers and Fibre Optics

Course Outcomes:

CO1: Understand the basic principles of laser.

CO2: How to construct various types of lasers and its functions.

CO3: Applications of fiber optic communication.

CO4: Acquire in depth knowledge related to the applications of laser.

19IPHYC53 - Analog Electronics

Course Outcomes:

CO1: Be familiar with the basic concepts of construction and working of electronic devices.

CO2: Acquire an in-depth knowledge about the linear circuit analysis.

CO3: Understand the basic ideas of semiconductor devices.

CO4: Enable the students to know the basic ideas of analog operations for various analog circuit problems.

19IPHYC54 - Energy Physics

Course Outcomes:

CO1: Be aware of various forms of energy and the effective utilization of their resources.

CO2: Be exposed to the practical usage of solar energy.

CO3: Be exposed to the practical usage of thermal energy.
CO4: Acquire an in-depth knowledge about the sustainable forms of energy.

19IPHYC55 - Solid State Physics

Course Outcomes:

CO1: Explore the relationships between chemical bonding and crystal structure.
CO2: Get the concrete idea about the superconductivity, high temperature superconductors and applications.
CO3: Inculcate the core concept of bond formation, ionic transition and variation of magnetic behaviour of elements by the ionic contribution.
CO4: Discuss logically the region for variation of dielectric behaviours of the elements.

19IPHYP56 - Practical –IV

Course Outcomes:

CO1: Basic laws and theories involving diodes, transistors, etc.,
CO2: Understand the given concepts and its physical significance
CO3: Apply the theory to design the basic electrical circuits
CO4: Use of these basic circuits to create amplifier circuits, oscillator, regulated power supplies etc.,

19IPHYC61 - Numerical Methods of Analysis

Course Outcomes:

CO1: Appreciate the numerical techniques of interpolation in various intervals.
CO2: Apply the numerical techniques of differentiation and integration for engineering problems.
CO3: Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
CO4: Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

19IPHYC62 - Digital Electronics

Course Outcomes:

CO1: Construct simple electronics circuit using logic gates.
CO2: Understand the concepts of number systems and conversion and logical reasons based on Boolean theorems.
CO3: Understand the working of various flip flops, registers and counters.
CO4: Apply the principles of electronics in day to life

19IPHYC63 - Nuclear Physics

Course Outcomes:

By the end of the course, students will be able to
CO1: Acquire knowledge of the fundamental physics underpinning nuclear physics.
CO2: Understand the nuclear structure and radioactivity and its applications.
CO3: Understand the fission and fusion reactors and how these are used for production of the energy as well as weapons.
CO4: Understand the fundamental concepts of cosmic rays and elementary particles.

19IPHYC64 - Relativity and Quantum Mechanics

Course Outcomes:

CO1: Understand relativity and its consequences.
CO2: Classify the velocities associated with wave packets.
CO3: Formulate Schrodinger's equation for the given problem.
CO4: Solve simple quantum mechanical problems.

19IPHYC65 – Astrophysics

Course Outcomes:

CO1: Understand the basics of Astrophysics with respect to our universe.

CO2: Understand the Universe and its constituents.

CO3 : Explain about the structure of sun and types of stars.

CO4 : Describe about the stellar structure and the origin of universe.

19IPHY66 - Practical – V

Course Outcomes:

CO1: Basic laws and theories involving amplifiers, integrated circuits, converters and flip flops etc.,

CO2: Understand the given concepts and its physical significance

CO3: Apply the theory to design the basic electrical circuits

CO4: Use of these basic circuits to create amplifier, integrated circuits, converters and flip flops etc.,

19IPHYC71 - Classical and Statistical Mechanics

Course Outcomes:

CO1: Formulate scientific questions about the mechanics of a particle and system of particles.

CO2: Use D'Alembert's principle to derive the Lagrange equations of motion.

CO3: Identify the differences of Bose -Einstein, Fermi-Dirac and Maxwell – Boltzmann statistics.

CO4: Describe the relationship between the statistical mechanics with thermodynamics.

19IPHYC72 – Electronics

Course Outcomes:

CO1: Understand the concept of various semiconductor devices by learning their characteristics.

CO2: Analyze the parameters of amplifiers, oscillators using transistors and familiarise with applications of operational amplifiers.

CO3: Understand the classifications of Semiconductor Memories.

CO4: Understand the concepts of Integrated circuits.

19IPHYC73 - Mathematical Physics – I

Course Outcomes:

CO1: Develop knowledge in mathematical physics and its applications.

CO2: Understand the use of complex variables for solving definite integral.

CO3: Understand the applications of group theory in all the branches of Physics problems.

CO4: Enable students to formulate, interpret and draw inferences from mathematical solutions.

19IPHY74- Practical – VI

Course Outcomes:

CO1: Basic laws and theories involving amplifiers, integrated circuits, converters and flip flops etc.,

CO2: Understand the given concepts and its physical significance

CO3: Apply the theory to design the basic electronic circuits

CO4: Provide a hands-on learning experience and understand the basic concepts and applications of microprocessor.

19IPHYC81- Mathematical Physics – II

Course Outcomes:

CO1: Develop knowledge in mathematical physics and its applications.

CO2: Develop expertise in mathematical techniques required in physics.

CO3: Use differential equations and special functions to solve mathematical problems of

interest in Physics.

CO4: Enable students to formulate, interpret and draw inferences from mathematical solutions.

19IPHYC82- Condensed Matter Physics – I

Course Outcomes:

CO1: Describe different types of crystal structures.

CO2: Understand the types of lattice vibrations and heat conduction.

CO3: Describe and understand the various imperfections in crystal.

CO4: Understand the band-structure of the solid.

19IPHYC83 - Electromagnetic Theory

Course Outcomes:

CO1: Applying vector calculus operations and developing knowledge of vector fields and scalar fields

CO2: Describing the fundamental nature of static fields, including steady current, static electric and magnetic fields

CO3: Formulating potential problems within electrostatics, magnetostatics and stationary current distributions in linear, isotropic media etc.,

CO4: Applying Maxwell's equations and their application to boundary conditions, wave equations, and Poynting's power-balance theorem.

19IPHYP84- Practical – VII

Course Outcomes:

CO1: Basic laws and theories involving amplifiers, integrated circuits, converters and flip flops etc.,

CO2: Understand the given concepts and its physical significance

CO3: Apply the theory to design the basic electrical circuits

CO4: provide a hands-on learning experience and understand the basic concepts and applications of laser and microprocessor.

19IPHYC91 - Quantum Mechanics – I

Course Outcomes:

CO1: Study the stationary state and eigen spectrum of systems using time dependent Schrodinger equation.

CO2: Know to solve the exactly soluble eigen value problems.

CO3: Know the matrix formulation of quantum theory and how it can be used to understand the equation of motion.

CO4: Understand the theory of identical particles and Angular momentum.

19IPHYC92 - Condensed Matter Physics – II

Course Outcomes:

CO1: Understand the dielectric properties of the solid systems.

CO2: Understand the ferroelectric and piezoelectric properties of the solid systems and its application.

CO3: Understand deeply the electrical and magnetic properties of crystalline solids with theoretical background.

CO4: Understand the theoretical basis of nanotechnology and carbon in nanotechnology.

19IPHYC93 - Nuclear And Elementary Particle Physics

Course Outcomes:

CO1: Understand about nuclear forces and their dependence on various parameters.

CO2: Compare various nuclear models and properties of the nucleus.

CO3: Understand the Nuclear energy sources through various nuclear reactions which are realized.
CO4: Know the causes for short range interaction inside the nucleons with mathematical formulations.

19IPHYP94 Practical – VIII

Course Outcomes:

CO1: Basic laws and theories involving amplifiers, integrated circuits, converters and flip flops etc.,
CO2: Understand the given concepts and its physical significance
CO3: Apply the theory to design the basic electrical circuits
CO4: Provide a hands-on learning experience and understand the basic concepts and applications of microcontroller.

19IPHYC101 - Quantum Mechanics – II

Course Outcomes:

CO1: Apply and appreciate the approximation methods to various problems
CO2: Identify the time dependent and time independent cases
CO3: Grasp the developments in relativistic quantum mechanics
CO4: Evaluate the quantum field parameters

19IPHYC102 – Spectroscopy

Course Outcomes:

CO1: Appreciate the principle of spectroscopy in different regions of the EM spectrum.
CO2: Relate the theory of spectroscopy to the study of molecular structure.
CO3: Identify the appropriate spectral technique as an analytical tool to investigate the characteristics of materials.
CO4: Outline and correlate for providing solution to interdisciplinary problem

19IPHYE103 - Physics of Nanomaterials

Course Outcomes:

CO1: Distinguish nanomaterials from bulk materials.
CO2: Apply their acquired knowledge in research level to synthesis and characterize the nanomaterials.
CO3: Identify the various techniques to investigate the different properties such as optical, structural and morphology of nanoparticles.
CO4: Select the nanomaterials for various applications.

19IPHYP104- Practical – IX

Course Outcomes:

CO1: Basic laws and theories involving amplifiers, integrated circuits, converters and flip flops etc.,
CO2: Understand the given concepts and its physical significance
CO3: Apply the theory to design the basic electrical circuits
CO4: Provide a hands-on learning experience and understand the basic concepts and applications of microcontroller.

19IPHYPJ105- Project

Course Outcomes:

CO1: Acquire the practical knowledge of understanding research problems.
CO2: Gain knowledge basic principles of various components of research
CO3: Apply the principles of chemistry in various fields.

CO4: Identify the appropriate spectral technique as an analytical tool to investigate the characteristics of materials.

19IPHYE 15.1 - Electrical Appliances

Course Outcomes:

CO1: Be familiar with the basic concepts of construction and working of electrical devices.

CO2: Understand the concepts and understand the working of transformers

CO3: Understanding the functioning of various house hold appliances

CO4: Apply the principles of electrical appliances in day to life.

19IPHYE 15.2 - Physics of Human Anatomy

Course Outcomes:

CO1: Understand the medical applications of light to human body.

CO2: Understand the law of physics to explain several bodily functions including the mechanics of breathing, acoustic properties of the ears and vision optics.

CO3: To understand the law of physics to explain several bodily functions including the mechanics of breathing, acoustic properties of the ears and vision optics.

CO4: Know the basic ideas in understanding the heat and work and energy of human body.

19IPHYE 35.1 - Basic Electronic Devices

Course Outcomes:

CO1: Be familiar with the basic concepts of construction and working of electronic devices.

CO2: Acquire an in-depth knowledge about the resistors, capacitors and inductors.

CO3: Understand the basic ideas of semiconductors.

CO4: Enable the students to know the ideas of transistors and working operations for various diodes.

19IPHYE 35.2 - Environmental Physics

Course Outcomes:

CO1: Describe various aspects of atmosphere.

CO2: Acquire knowledge regarding weather and climate

CO3: Appraise the concept of distribution of temperature and temperature inversion.

CO4: Analyze the factors affecting atmospheric and wind pressure.

CO5: Interpret the concept of Energy in Biology

19IPHYE 56.2 - Audio and Video Systems

CO1: Describe the various aspects of sound.

CO2: Acquire knowledge regarding Audios and Video system.

CO3: Appraise the concept of Digital and LCD Television.

CO4: Highlight the concept of LED and LCD

19IPHYE85.1 - Microprocessors and Microcontroller

Course Outcomes:

CO1: Describe basic concept and architecture of 8085 microprocessor and implement programs in 8085.

CO2: Learn the architecture of 8086 microprocessor.

CO3: Understand the architecture of 8051 microcontroller and develop assembly language programs.

CO4: Discuss concept of interfacing in microprocessor 8085.

19IPHYE85.2 - Physics of the Earth

Course Outcomes:

- CO1: Think and analyse the concept of the Earth and its properties.
- CO2: Accumulate the various concept proposed by theories and laws.
- CO3: Enlighten the concept solar system.
- CO4: Acquire basic knowledge about geomagnetism and paleomagnetism.

19IPHYE85.3 - Energy Physics

Course Outcomes:

- CO1: Be aware of various forms of energy and the effective utilization of their resources.
- CO2: Be exposed to the practical usage of solar energy.
- CO3: Be exposed to the practical usage of thermal energy.
- CO4: Acquire an in depth knowledge about the sustainable forms of energy.

19IPHYE95.1 – Instrumentation

Course Outcomes:

- CO1: Select the types of transducer for a particular measurement.
- CO2: Test and use the digital instruments for different applications.
- CO3: Understand the various analytical and biomedical instrumentation and their uses.
- CO4: Know the functioning of medical imaging instruments.

19IPHYE95.2- Bio-Medical Instrumentation

Course Outcomes:

- CO1: Understand the importance of bio medical instruments and accuracy of the measured physical parameters and their practical implementation in the medical field.
- CO2: Understand experimentally recording data, its inference to diagnose the diseases.
- CO3: Understand various techniques and its relevance in various defects in the body parts.
- CO4: Solve the health issues from the bio medical instruments and applicability in physics concepts may give the clear idea about the health issues.

19IPHYE95.3 - Petro Physics

Course Outcomes:

- CO1: Understand the various magnetites and behaviour of the remenance properties.
- CO2: Sudy the geomagnetic elements of the earth and various magnetometer instruments.
- CO3: To understand the classification and properties of of rock forming minerals
- CO4: To highlight the concept of seismic waves and various dating methods.

19IPHYE95.4 - Medical Physics

Course Outcomes:

- CO1 :To gain the knowledge about the bio medical instruments used for measuring bio-electric potentials and the electrodes used for sensing the bio potentials.
- CO2: To understand the working principles of imaging equipments used for determining the physiological parameters.
- CO3 :To understand the working principles of bio medical instruments used for determining the physiological parameters.
- CO4 : To update the knowledge of various nuclear medicine and biological effects of radiation.

19IPHYE95.5 – Biophysics

Course Outcomes:

- CO1: Have in-depth knowledge of the structure of cells and the macro molecular structure.

CO2: Understand the basic principles of the various microscopic techniques presented in the course, their advantages and limitations.
CO3: Provide an introduction to various separation techniques that are used in biological samples.
CO4: Understand the different processes of optical and diffraction techniques.

19IPHYA-1- Ancillary Physics-I

Course Outcomes:

CO1: Understand the behaviour of fluids and practical applications of the same in real life.
CO2: Understand relativity and its consequences.
CO3: Acquire in depth knowledge of various lasers and diodes used for different applications.
CO4: Knowledge about the different types of nuclear models and detectors.

19IPHYA-2- Ancillary Physics – II

Course Outcomes:

CO1: Understand the atomic models, production of X-rays and photoelectric effect with its applications.
CO2: Understand the various nuclear detectors and particle accelerators.
CO3: Understand the phenomenon of polarization.
CO4: Acquire basic knowledge about number systems and logic gates.

19IPHYAP-1- Ancillary Physics Practical –I

Course Outcomes:

CO1: Apply knowledge of physics fundamentals and an instrumentation to arrive solution for various problems.
CO2: Understand the usage of basic laws and theories to determine various properties of the materials given.
CO3: Understand the application side of the experiments
CO4: Use of basic laws to study the spectral properties and optical properties of the given prism.

19IPHYAP-2- Ancillary Physics Practical – II

Course Outcomes:

CO1: Apply knowledge of physics fundamentals and an instrumentation to arrive solution for various problems.
CO2: Understand the usage of basic laws and theories to determine various properties of the materials given.
CO3: Understand the application side of the experiments
CO4: Acquire in depth knowledge regarding the basic concepts in electricity and magnetism.

19IPHYIE85.1: Classical Mechanics and Special Theory of Relativity

Course Outcomes:

CO1: Know the physical concepts and facility with the mathematical methods of classical mechanics
CO2: Use D'Alembert's principle to derive the Lagrange equations of motion.
CO3: Acquire fundamental knowledge of classical mechanics.
CO4: Understand relativity and its consequences

19IPHYIE85.2: Physics of the Earth

Course Outcomes:

CO1: Think and analyse the concept of the Earth and its properties.
CO2 : Accumulate the various concept proposed by theories and laws.

CO3 : Enlighten the concept solar system.

CO4: Acquire basic knowledge about geomagnetism and paleomagnetism.

19IPHYIE95.1: Bio-Medical Instrumentation

Course Outcomes:

CO1: Understand the importance of bio medical instruments and accuracy of the measured physical parameters and their practical implementation in the medical field.

CO2: Understand experimentally recording data, its inference to diagnose the diseases.

CO3: Understand various techniques and its relevance in various defects in the body parts.

CO4: Solve the health issues from the bio medical instruments and applicability in physics concepts may give the clear idea about the health issues.

19IPHYIE 95.2: Energy Physics

Course Outcomes:

CO1: Be aware of various forms of energy and the effective utilization of their resources.

CO2: Be exposed to the practical usage of solar energy.

CO3: Be exposed to the practical usage of thermal energy.

CO4: Acquire an in depth knowledge about the sustainable forms of energy.

Value Added Course

BIO- Medical Instrumentation

Course Outcomes:

CO1: Understand the structure and physiological functioning of various organ systems of human body

CO2: Master the common bio-separation techniques used for clinical applications

CO3: Operate various medical equipments working on the principles of bio-electric potentials

CO4: Understand the basic principles and operations of various imaging equipments used in the clinical field

DEPARTMENT OF PHYSICS M.Sc. Physics (Two-Year Programme)

19PHYC101 - Classical and Statistical Mechanics

Course Outcomes:

CO1: Formulate scientific questions about the mechanics of a particle and system of particles.

CO2: Use D'Alembert's principle to derive the Lagrange equations of motion.

CO3: Identify the differences of Bose -Einstein, Fermi-Dirac and Maxwell – Boltzmann statistics.

CO4: Describe the relationship between the statistical mechanics with thermodynamics.

19PHYC102 – Electronics

Course Outcomes:

By the end of the course, the students will be able to

- CO1: Understand the concept of various semiconductor devices by learning their characteristics.
- CO2: Analyze the parameters of amplifiers, oscillators using transistors and familiarize with applications of operational amplifiers.
- CO3: Understand the classifications of Semiconductor Memories.
- CO4: Understand the concepts of Integrated circuits.

19PHYC103 - Mathematical Physics – I

Course Outcomes:

By the end of the course, the students will be able to

- CO1: Develop knowledge in mathematical physics and its applications.
- CO2: Understand the use of complex variables for solving definite integral.
- CO3: Understand the applications of group theory in all the branches of Physics problems.
- CO4: Enable students to formulate, interpret and draw inferences from mathematical solutions.

19PHYP104- Practical – I

Course Outcomes:

- CO1: Understand the basic laws and theories regarding the various properties of the materials.
- CO2: Understand the given concepts and its physical significance
- CO3: Apply the theory to design the basic electronic circuits
- CO4: Provide a hands-on learning experience and understand the basic concepts and applications of microprocessor.

19PHYC201- Mathematical Physics – II

Course Outcomes:

By the end of the course, the student will be able to

- CO1: Develop knowledge in mathematical physics and its applications.
- CO2: Develop expertise in mathematical techniques required in physics.
- CO3: Use differential equations and special functions to solve mathematical problems of interest in Physics.
- CO4: Enable students to formulate, interpret and draw inferences from mathematical solutions.

19PHYC202- Condensed Matter Physics – I

Course Outcomes:

By the end of the course, the student will be able to

- CO1: Describe different types of crystal structures.
- CO2: Understand the types of lattice vibrations and heat conduction.
- CO3: Describe and understand the various imperfections in crystals.
- CO4: Understand the band-structure of the solid.

19PHYC203 - Electromagnetic Theory

Course Outcomes:

By the end of the course, the student will be able to

- CO1: Applying vector calculus operations and developing knowledge of vector fields and scalar fields
- CO2: Describing the fundamental nature of static fields, including steady current, static electric and magnetic fields
- CO3: Formulating potential problems within electrostatics, magnetostatics and stationary current distributions in linear, isotropic media etc.,

CO4: Applying Maxwell's equations and their application to boundary conditions, wave equations, and Poynting's power-balance theorem.

19PHYP204 - Practical – II

Course Outcomes:

CO1: Understand the basic laws and theories regarding the various properties of the materials.

CO2: Understand the given concepts and its physical significance

CO3: Apply the theory to design the basic electrical circuits

CO4: provide a hands-on learning experience and understand the basic concepts and applications of laser and microprocessor.

19PHYC301 - Quantum Mechanics – I

Course Outcomes:

By the end of the course, the student should be able to

CO1: Study the stationary state and eigen spectrum of systems using time dependent Schrodinger equation.

CO2: Know to solve the exactly soluble eigen value problems.

CO3: Know the matrix formulation of quantum theory and how it can be used to understand the equation of motion.

CO4: Understand the theory of identical particles and Angular momentum.

19PHYC302 - Condensed Matter Physics – II

Course Outcomes:

By the end of the course, the student will be able to

CO1: Understand the dielectric properties of the solid systems.

CO2: Understand the ferroelectric and piezoelectric properties of the solid systems and its application.

CO3: Understand deeply the electrical and magnetic properties of crystalline solids with theoretical background.

CO4: Understand the theoretical basis of nanotechnology and carbon in nanotechnology.

19PHYC303 - Nuclear and Elementary Particle Physics

Course Outcomes:

By the end of the Course, the student will be able to

CO1: Understand about nuclear forces and their dependence on various parameters.

CO2: Compare various nuclear models and properties of the nucleus.

CO3: Understand the Nuclear energy sources through various nuclear reactions.

CO4: Know the causes for short range interaction inside the nucleons with mathematical formulations.

19PHYP304 Practical –III

Course Outcomes:

CO1: Understand the basic laws and theories regarding the various properties of the materials.

CO2: Understand the given concepts and its physical significance

CO3: Apply the theory to design the basic electrical circuits

CO4: provide a hands-on learning experience and understand the basic concepts and applications of microcontroller.

19PHYC401 - Quantum Mechanics – II

Course Outcomes:

By the end of the Course, the students will be able to

CO1: Apply and appreciate the approximation methods to various problems

CO2: Identify the time dependent and time independent cases

CO3: Grasp the developments in relativistic quantum mechanics

CO4: Evaluate the quantum field parameters

19PHYC402 – Spectroscopy**Course Outcomes:**

By the end of the Course, the student will be able to

CO1: Appreciate the principle of spectroscopy in different regions of the EM spectrum.

CO2 : Relate the theory of spectroscopy to the study of molecular structure.

CO3 : Identify the appropriate spectral technique as an analytical tool to investigate the characteristics of materials.

CO4 : Outline and correlate for providing solution to interdisciplinary problem.

19PHYC403 - Physics of Nanomaterials**Course Outcomes:**

By the end of the course, the student will be able to

CO1: Distinguish nanomaterials from bulk materials..

CO2: Apply their acquired knowledge in research level to synthesis and characterize the nanomaterials.

CO3: Identify the various techniques to investigate the different properties such as optical, structural and morphology of nanoparticles.

CO4: Select the nanomaterials for various applications

19PHYP404 - Practical – IV**Course Outcomes:**

CO1: Understand the basic laws and theories regarding the various properties of the materials.

CO2: Understand the given concepts and its physical significance

CO3: Apply the theory to design the basic electrical circuits

CO4: provide a hands-on learning experience and understand the basic concepts and applications of microcontroller.

19PHYPJ405- Project

At the end of the course, the students will

CO1: Acquire the practical knowledge of understanding research problems.

CO2: Gain knowledge basic principles of various components of research

CO3: Apply the principles of chemistry in various fields.

CO4: Identify the appropriate spectral technique as an analytical tool to investigate the characteristics of materials.

19PHYE205.1 - Microprocessors and Microcontroller**Course Outcomes:**

By the end of the course, the students will be able to

CO1: Describe basic concept and architecture of 8085 microprocessor and implement programs in 8085.

CO2: Learn the architecture of 8086 microprocessor.

CO3: Understand the architecture of 8051 microcontroller and develop assembly

language programs.

CO4: Discuss concept of interfacing in microprocessor 8085.

19PHYE205.2 - Physics of the Earth

Course Outcomes:

By the end of the semester, the students will be able to

CO1: Think and analyse the concept of the Earth and its properties.

CO2 : Accumulate the various concepts proposed by theories and laws.

CO3 : Enlighten the concept solar system.

CO4: Acquire basic knowledge about geomagnetism and palaeomagnetism.

19PHYE205.3 - Energy Physics

Course Outcomes:

By the end of the course, the student will be able to

CO1: Be aware of various forms of energy and the effective utilization of their resources.

CO2: Be exposed to the practical usage of solar energy.

CO3: Be exposed to the practical usage of thermal energy.

CO4: Acquire an in depth knowledge about the sustainable forms of energy.

19PHYE305.1 – Instrumentation

Course Outcomes:

By the end of the Course, the students will be able to

CO1: Select the types of transducer for a particular measurement.

CO2: Test and use the digital instruments for different applications.

CO3: Understand the various analytical and biomedical instrumentation and their uses.

CO4: Know the functioning of medical imaging instruments.

19PHYE305.2- Bio-Medical Instrumentation

Course Outcomes:

By the end of the course, the student will be able to

CO1: Understand the importance of bio medical instruments and accuracy of the measured physical parameters and their practical implementation in the medical field.

CO2: Understand experimentally recording data, its inference to diagnose the diseases.

CO3: Understand various techniques and its relevance in various defects in the body parts.

CO4: Solve the health issues from the bio medical instruments and applicability in physics concepts may give the clear idea about the health issues.

19PHYE305.3 - Petro Physics

Course Outcomes:

By the end of the course, the student will be able to

CO1: Understand the various magnetites and behaviour of the remenance properties.

CO2: Study the geomagnetic elements of the earth and various magnetometer instruments.

CO3: Understand the classification and properties of rock forming minerals

CO4: Highlight the concept of seismic waves and various dating methods.

19PHYE305.4 - Medical Physics

Course Outcomes:

By the end of the course, the student will be able to

CO1: To gain the knowledge about the bio medical instruments used for measuring bio-

electric potentials and the electrodes used for sensing the bio potentials.

CO2: To understand the working principles of imaging equipments used for determining the physiological parameters.

CO3: To understand the working principles of bio medical instruments used for determining the physiological parameters.

CO4: To update the knowledge of various nuclear medicine and biological effects of radiation.

19PHYE305.5 – Biophysics

Course Outcomes:

By the end of the course, the students will be able to

CO1: Have in-depth knowledge of the structure of cells and the macromolecular structure.

CO2: Understand the basic principles of the various microscopic techniques presented in the course, their advantages and limitations.

CO3: Provide an introduction to various separation techniques that are used in biological samples.

CO4: Understand the different processes of optical and diffraction techniques.