



## **MANNAR THIRUMALAI NAICKER COLLEGE (Autonomous)**

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

(Accredited with “A” Grade by NAAC)

Pasumalai, Madurai -625004

### **I & II SEMESTER - COURSE OUTCOMES**

#### **SCIENCE**

##### **M.Sc PHYSICS**

18PPHC11

##### **MATHEMATICAL PHYSICS – I**

###### **Course Outcomes:**

**CO1:** To acquire knowledge of Vector Algebra and its applications.

**CO2:** To understand the fundamentals of matrices.

**CO3:** To learn the concepts of Fourier series and Fourier transforms.

**CO4:** To know the special functions and their physical applications.

18PPHC12

##### **CLASSICAL AND STATISTICAL MECHANICS**

###### **Course Outcomes:**

**CO1:** To study the Hamiltonian formulation of classical mechanics and apply it to simple systems.

**CO2:** To acquire knowledge of canonical transformation and Poisson’s Brackets.

**CO3:** To observe the oscillatory motion of the particles.

**CO4:** To be familiar with Bose and Fermi ideal systems.

18PPHC13

##### **ELECTRONICS – I**

###### **Course Outcomes:**

**CO1:** To get knowledge of communication system through modulation.

**CO2:** To appreciate the applications of operational amplifier.

**CO3:** To familiarize semiconductor devices and their importances.

**CO4:** To understand the different microwave devices and oscillators.

18PPHE11

##### **ENERGY PHYSICS**

###### **Course Outcomes:**

**CO1:** To get the knowledge of renewable energy sources

**CO2:** To acquire knowledge of solar powered devices.

**CO3:** To acquaint with various types of non-conventional energy sources.

**CO4:** To observe the effect and causes of pollutions.

18PPHE12

### **COMPUTATIONAL PHYSICS**

#### **Course Outcomes:**

**CO1:** To understand numerical methods for finding algebraic solutions.

**CO2:** To get the knowledge of interpolation method.

**CO3:** To learn the fundamentals of programming concepts.

**CO4:** To improve the programming skills through C++ language and apply it in practicals.

18PPHCP1

### **PRACTICAL – I**

#### **Non - Electronics**

#### **Course Outcomes:**

**CO1:** To make the students to know the experimental techniques of exposure of Equipment's and their handling procedures.

**CO2:** To understand the concepts and principles by verifying with experimental results.

**CO3:** To understand different numerical methods and their applications.

**CO4:** To do the numerical methods programming with C++ language.

18PPHCP2

### **PRACTICAL – II**

#### **Electronics – I**

#### **Course Outcomes:**

**CO1:** To acquire knowledge of semiconductor devices and their applications.

**CO2:** To understand the concepts of OPAMPS and their uses.

**CO3:** To study oscillator and amplifier circuits.

**CO4:** To develop the skills in handling instruments and measuring devices.

18PPHC21

### **MATHEMATICAL PHYSICS-II**

#### **Course Outcomes:**

**CO1:** To study the concept of complex variable equations and formula.

**CO2:** To observe the evaluations of types of integrals and tensor analysis.

**CO3:** To learn group theory and theory and their physical applications.

**CO4:** To get knowledge of probability through various distribution.

18PPHC22

### **QUANTUM MECHANICS – I**

**Course Outcomes:**

**CO1:** To get familiarized with the basics of quantum mechanics.

**CO2:** To understand Schrodinger's formulation of wave mechanics.

**CO3:** To solve three dimensional problems using Schrodinger's method.

**CO4:** To study various appreciation methods.

18PPHC23

**ELECTRONICS - II**

**Course Outcomes:**

**CO1:** To understand the basic principles of logic circuits.

**CO2:** To be familiar with conditional and data processing circuits.

**CO3:** To induce basic knowledge about the complex digital system construction.

**CO4:** To know about the constructions of registers and counters

18PPHE21

**ANALYTICAL INSTRUMENTATION**

**Course Outcomes:**

**CO1:** To enable the students to understand the basic concepts of analytical Instruments used in physics.

**CO2:** To know the Instrumentations of emission and absorption spectrometry.

**CO3:** To understand the Instrumentation of source, detection and handling technique in characterizations.

**CO4:** To compare different techniques of instrumentation with their efficiency and uses.

18PPHE22

**CRYSTAL PHYSICS**

**Course Outcomes:**

1. To provide a qualitative idea on the fundamentals of growing crystals methods.
2. To understand the experimental procedure to grow
3. To learn linear and non-linear optical studies of ----
4. To study the thermal & hardness characterization of crystals.

18PPHCP1

**PRACTICAL – I**

**Non – Electronics**

**Course Outcomes:**

**CO1:** To make the students to know the experimental techniques of exposure of Equipments and their handling procedures.

**CO2:** To understand the concepts and principles by verifying with experimental results.

**CO3:** To understand different numerical methods and their applications.

**CO4:** To do the numerical methods programming with C++ language.

18PPHCP2

## **PRACTICAL – II**

### **Electronics – I**

#### **Course Outcomes:**

**CO1:** To acquire knowledge of semiconductor devices and their applications.

**CO2:** To understand the concepts of OPAMPS and their uses.

**CO3:** To study oscillator and amplifier circuits.

**CO4:** To develop the skills in handling instruments and measuring devices.

## **SCIENCE**

### **III & IV SEMESTER - COURSE OUTCOMES**

#### **M.Sc., PHYSICS**

18PPHC31

### **SOLID STATE PHYSICS – I**

#### **Course Outcomes:**

**CO1:** To Study the concept of crystal structures.

**CO2:** To understand the different type of bonds in a crystals.

**CO3:** To get knowledge of vibration of molecules.

**CO4:** To know about the Fermi gas and Fermi surfaces.

18PPHC32

### **QUANTUM MECHANICS – II**

#### **Course Outcomes:**

**CO1:** To get the knowledge of the Heisenberg model.

**CO2:** To understand the concept of scattering cross sections.

**CO3:** To reveal the theory of relativistic wave equation.

**CO4:** To understand the effect of symmetries in Quantum mechanics.

18PPHC33

### **ELECTRODYNAMICS**

#### **Course Outcomes:**

**CO1:** To understand the principles of conservation of charge and superposition in electrostatics

**CO2:** To determine electric field energy due to charge distribution in a material media

**CO3:** To analyze the propagation of electromagnetic waves in a material medium

**CO4:** To study the electromagnetic radiation due to a charge distribution.

18PPHN31

### **NANOTECHNOLOGY**

**Course Outcomes:**

- CO1:** To know about the basic concepts of nanotechnology.
- CO2:** To study the solid state nature of the crystals.
- CO3:** To acquire the knowledge of nanotubes and nanowires.
- CO4:** To describe MEMS basic process and manufacturing technologies.
- CO5:** To discuss nanocomposites synthesis and applications.

18PPHC41

**SOLID STATE PHYSICS - II**

**Course Outcomes:**

- CO1:** To study the concept of superconductivity in metals.
- CO2:** To get the knowledge of magnetization in bulk materials.
- CO3:** To bring the detailed ideas of dielectric and ferro electric crystals.
- CO4:** To understand about various defects and diffusion in metals.

18PPHC42

**NUCLEAR PHYSICS**

**Course Outcomes:**

- CO1:** To acquire the knowledge about the constituents of nucleus.
- CO2:** To know about detectors for nuclear particles.
- CO3:** To study the activities of nuclear fission and fusion processes.
- CO4:** To understand the concepts of Elementary particles.

18PPHC43

**MOLECULAR SPECTROSCOPY**

**Course Outcomes:**

- CO1:** To study the experimental methods for various spectroscopy
- CO2:** To get the knowledge of spectrum analysis
- CO3:** To know about the applications of molecular spectroscopy
- CO4:** To understand spin resonance spectroscopy.

18PPHE41

**ASTRO PHYSICS**

**Course Outcomes:**

- CO1:** To acquire the knowledge about the Classification of Stars.
- CO2:** To know about Sun and Atmosphere of Stars.
- CO3:** To study about the Multiple Stars.
- CO4:** To understand the classification of Variable Stars.

18PPHE42

## NETWORK AND COMMUNICATIONS

### Course Outcomes:

- CO1:** To know the concepts of network topology
- CO2:** To understand the Internet and data communications systems
- CO3:** To study the Microwave Communication process
- CO4:** To familiarize tele Communication through Satellite.

18PPHE43

## ADVANCED OPTICS

### Course outcomes:

- CO1:** To acquire the knowledge about the magneto and electro optic effects.
- CO2:** To know about laser principles and types.
- CO3:** To study the holographic formation and applications.
- CO4:** To understand the principles and applications of fiber and non-linear optics and their applications.

18PPHPR1

## PROJECT WORK AND VIVA-VOCE

### Course Outcomes:

- CO1:** To develop the ability of the students to prepare a project.
- CO2:** To get clear idea about the new concepts in our field apart from the syllabus.
- CO3:** To discuss the analytical instrumentations used.
- CO4:** To analyse the social use of the project.