

# **Department of physics**

## **PROGRAM OUTCOME B.Sc.**

The undergraduate course in physics aimed to provide the necessary input to the students coming from higher secondary level. The course is designed with a target to polish and refine the knowledge of physics, so that they become more familiar with fundamental concepts and problem solving approach. The course also aimed to encourage students to play a pivotal role in technological development of nation and move towards innovative mindsets.

## **PROGRAM OUTCOME (M.Sc)**

The post graduate program Physics (M.Sc) is aimed to provide specialised study in physics to science graduates in mathematics Stream. The course is designed to provide specific carrier oriented programme which gives students a broad spectrum to understand Physics. The course has variety of contents to understand different fields in physics, to make students more aware to face advance level studies and research.

## **PROGRAM SPECIFIC OUTCOME(B.Sc.)**

The course has target to prepare candidates with scientific approach and good knowledge in physics, ready to join research, academics or administration to serve society and nation.

- To create, select and apply proper techniques, resources and aids in multidisciplinary environment.
- To prepare them with competitive behaviour that help to find their carrier oriented lifestyle

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### **Course Outcome**

#### **B.Sc. I year:-**

- To introduce the basics of mechanics and create problem solving approach in mechanics
- Learn the basics of properties of matter, How solid and Liquid matter behaves and give characteristics in physical changes.
- To Learn the effect of electric field and magnetic field in instrumentation and get theoretical as well as experimental knowledge of it.
- To Learn the fundamental ideas of electrostatics and magnetostatics and to apply them to understand general phenomenon.
- To learn the behaviour of electrical circuit with different elements and enhance the capability of analytical study in electrical devices.

## **B. Sc. II year**

- To become familiar with various concept and phenomena in thermodynamics
- To Clear understanding of advanced thermodynamic processes and develop problem solving approach.
- To introduce the basic concept of statistical mechanics and expand the knowledge to the optimum level so that they must understand the theoretical phenomenon in materials.
- To learn about waves and oscillations and apply them to understand the theory and application of it.
- To learn advance level in optics and understand the working of common optical instruments. Detailed knowledge of interference, diffraction and polarisation with problem is provided.
- To learn the concept of laser system and different type of laser with their applications.

## **B.Sc III Year**

- To know the origin of quantum mechanics and necessity to explain various effects.
- To learn fundamental concepts of quantum mechanics and approach to the complex problems that can be explained.
- To get the qualitative idea of atomic and molecular spectra and related effects like Raman effect and Zeeman effect.
- To understand the phenomenon of Nuclear physics and know the working and theory of nuclear reactor. To know the basics of elementary particles.
- Basics of Solid state physics is to be learned to understand the electrical and magnetic properties of solid materials.
- To learn the basics of solid state devices like diode and transistor and understand their working and applications.
- To learn C programming basics and apply it in general mathematical cases.

## **Course outcome (M.Sc.)**

### **M.Sc. I semester**

- Important mathematics used to understand physics at higher level is to know. Detailed study on metrics, complex analysis, differential equation, special function and integral transform has to be done.
- To understand the classical mechanics in generalised coordinate and analyse the problem in Langrangian and Hamiltonian formulation methods. To know the various theorems that can be used to understand the higher degree of knowledge in classical mechanics.
- To understand advanced analysis in electrodynamics and instrumentation used in research field. To know the innovative phenomenon in Plasma physics.
- To get the knowledge beyond diode and transistor of basis electronics by studying JFET, MOSFET, UJT, SCR, Diac and Triac like electronics components. To understanding of optoelectronics and related phenomenon and devices.
- To get experimental knowledge of basics in electronics devices.

### **M.Sc. II semester:**

- To learn the Quantum mechanics advanced to the graduate course by used new methods and symbolism in quantum mechanics.
- To study the Statistical physics with basic concept and method of formation of problems and phenomenon.
- To learn the advanced electronics used in digital electronics like operational amplifiers, basic logic design, microprocessors and their applications.
- To understand the numerical analysis method and their use to analysis experimental data in physics and fitting of experimental data to the theoretical consideration.
- To get experimental knowledge of general properties and electronics.

### **M.Sc. III semester:**

- To study the advanced Quantum mechanics method like variation method, WKB approximation, partial wave analysis and time dependent perturbation and applications of them in solving complex problems.
- To learn atomic and molecular physics to understand the spectral behaviour of matter and their theoretical analysis. Detailed study of various effects related to spectra and their applications.
- To understand the basics of solid state physics, crystal structure, band formation in solids and their applications. To learn the basics phenomenon of superconductivity.
- To learn the electronics used in communications, radar, satellite and their working. To study the microwave devices like klystron and magnetron and their applications in different field.
- To learn the working of advanced electronic equipments by doing experiments and make minor project based on electronics.

### **M.Sc. IV semester:**

- To study the advanced level of nuclear and particle physics and understanding of structure and phenomenon related to nucleus. To understand the interaction of elementary particle and explain them theoretically.
- To understand the basics of laser physics, different type of lasers and their applications.
- To study the advanced level of solid state physics, dielectrics, ferroelectrics, magnetic materials and their types and different type of defects in crystalline materials.
- To study the various type of digital communication system and their mathematical analysis and applications in current age communication systems.
- To make a major project to upgrade experimental knowledge.

## **Add-on-course-PO**

The benefits of career-oriented course can be extended to regular students. Education plays very vital in each and every person's life. The aim of college is to bring the quality education to the student in every aspect of life with view and looking at the future and of the EEM.

## **Add-on-course-PSO**

The students of B.Sc. degree get additional advantage if they have diploma and advance diploma qualification, specially industrial sectors in private factory. In railway, they will get preference in various technical posts. Their additional add-on-course will help them to stabilized their own construction and repairing of mostly all the electronics and electrical equipments used in industries and household equipments. So the course is helpful for self employment as well.

## **Add on Course (Certificate Course) E.E.M.**

### **For B.Sc. Students**

#### **EEM. I<sup>st</sup> year**

- Basics information of electronic and electrical components like resistors capacitors, inductors, transformers. To learn their working and uses in electrical and electronic circuits.
- To learn the theory and experimental knowledge of transducers. To learn the basics of digital electronics.
- To study basic electronic components like diode, SCR, Transistor, IC/S and their application with troubleshooting.
- To study the power amplifiers and oscillators and experimental working.

#### **EEM II<sup>nd</sup> Year**

- To understand the working of logic gates and operational amplifiers and their applications.
- To study different type of amplifiers used in electronic equipments and their study with trouble shooting.
- Advanced type of IC'S and microprocessor to be studied and their application.

- To understand the SMPS and UPS like computer peripherals as per practical knowledge.

### **EEM IIIrd Year**

- To study the equipments used in telecommunication and types of antenna and receivers, their working and repairing work.
- To understand the television working and study the problems and their solution.
- Working of compact disk, Telephone and mobile and their repair work.