

॥ संहती कार्य साधिका, शिलं परम भूषणं ॥

**Shetkari Shikshan Prasarak Mandal's  
KRISHNA MAHAVIDYALYA RETHARE BK.**

**Department of Physics**  
**PROGRAM SPECIFIC OUTCOMES**  
**AND**  
**COURSE OUTCOMES**  
**FOR OUTCOME-BASED EDUCATION**  
**ACADEMIC YEAR**  
**2018-2019**

Shetkari Shikshan Prasarak Mandal's

**KRISHNA MAHAVIDYALAYA, RETHARE BK**

**DEPARTMENT OF PHYSICS**

**PROGRAMME OUTCOMES**

**Academic Year 2018-2019**

After completion of the B. Sc programme, the students will develop ability:

- A. The B.Sc Programme develops an insight into scientific inquisitiveness among students.
- B. It increases **scientific** temperament and attitude among science graduates.
- C. It creates a systematic method of study ie. Observation, Experiment, and Conclusion which is a basic principle of scientific research.
- D. The qualities of a science – observation, precision, analytical mind, logical thinking, clarity of thought and expression, systematic approach, and qualitative and quantitative decision making are enlarged.
- E. The program also empowers the graduates to appear for various competitive examinations or choose the postgraduate programme of their choice.
- F. It trains the learners to extract information, formulate a scientific method of study and solve problems in a systematic and logical manner
- G. This programme enables the learners to perform jobs in diverse fields such as agriculture, industries, engineering, survey, education, banking, development-planning, business, public service, self-business, etc., efficiently.
- H. The programme also helps the students to perform their carrier in the field of basic and applied research.
- I. Understood the basic concepts, fundamental principles, and scientific theories related to various scientific phenomena and their relevancies in today's life.

After completion of the programme, the students will develop ability:

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**DEPARTMENT OF PHYSICS**

**PROGRAMME SPECIFIC OUTCOMES**

**Academic Year 2018-2019**

**PSO-A:** To understand the core knowledge of Physics and the basic concepts which help them in understanding physical phenomenon in nature.

**PSO-B:** It Identifies their area of interest and further specialization in the subject and develops skills and competencies to conduct scientific experiments related to Physics.

**PSO-C:** The study inculcates a rigorous understanding of the core theories & principles of physics, which includes mechanics, electromagnetism, thermodynamics, & quantum mechanics.

**PSO-D:** It helps to understand the set of physical laws, describing the motion of bodies, under the influence of the system of forces.

**PSO-E:** It provides knowledge about material properties and their application for developing technology to solve society's problems.

**PSO-F:** To learn the structure of solid materials & their different physical properties along with metallurgy, cryogenics, electronics & material science.

**PSO-G:** To understand the fundamental theory of nature & levels of atom & sub-atomic particles.

**PSO-H:** It provides advanced knowledge and skills for technical work in industries along with their knowledge and skills in carrying out independent work.

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**DEPARTMENT OF PHYSICS**  
**PHYSICS COURSE OUTCOMES**

**Academic Year 2018-2019**

**B.Sc. (Physics)**

**Annexure-C**

**Course Outcomes: B.Sc. I Paper I: DSC- 1 A MECHANICS-I**

By the end of this Course students should be able to know about:

- CO1. Different types of motions in nature.
- CO 2. Difference between translational motion and rotational motion.
- CO 3. Different laws of motion.
- CO 4. Differential equations and their applications.

**B.Sc. I Paper II: DSC- 2 A MECHANICS-II**

By the end of this Course students should be able to know about:

- CO 1. Oscillations and waves and their properties.
- CO 2. Use of waves in general life.
- CO 3. Various elastic constants and properties of elasticity.
- CO 4. Surface tension and their applications.
- CO 5. Applications of GPS and Satellite.

**Paper III: DSC- B ELECTRICITY AND MAGNETISM-I**

By the end of this Course students should be able to know about:

- CO 1. Scalar vectors and their mathematical Applications.
- CO 2. Dielectric phenomenon.
- CO 3. Difference between polar and non-polar molecules.
- CO 4. Various types of Condensers and calculation of capacity.

**Paper IV: DSC- 2B ELECTRICITY AND MAGNETISM-II**

By the end of this Course students should be able to know about:

CO 1. What is the origin of the magnetic property of material?

CO 2. Complex numbers and their application in solving problems in AC circuits.

CO 3. Biot-Savart's law and its applications.

CO 4. Maxwell's equations and electromagnetic wave propagation in vacuum and isotropic dielectric medium.

### **Paper V : General Physics, Sound and Acoustics**

By the end of this Course students should be able to know about:

CO 1. Vectors and its related theorems.

CO 2. Concept of precessional motion.

CO 3. Nature of elasticity and viscosity.

CO 4. Concept of Sound and acoustics of buildings.

### **Paper VI: Electronics and Semiconductor Devices**

By the end of this Course students should be able to know about:

CO 1. Construction, working and principle of cathode ray oscilloscope.

CO 2. Different types of oscillator circuits.

CO 3. Concept of operational amplifier.

CO 4. Various aspects of digital electronics

CO 5. Construction, working and characteristics of UJT.

CO 6. Structure, working principle and applications of FET and JFET.

### **Paper VII: Optics and Lasers**

By the end of this Course students should be able to know about:

CO 1. Lenses and various cardinal points.

CO 2. Fabry-Perot interferometer and Michelson's interferometer.

CO 3. Concept of diffraction of light.

CO 4. Optical fibers, their types, and applications.

CO 5. Resolving the power of different optical instruments.

CO 6. LASERS and applications in various fields.

## **Paper VIII: DSC- D2 - WAVES AND OPTICS-II**

By the end of this Course students should be able to know about:

- CO 1. Special relativity and its consequences.
- CO 2. Concept of wave-particle duality with reference to De Broglie waves.
- CO 3. Vector atom model and quantum numbers.
- CO 4.  $\gamma$ -rays and various phenomenon related to X-rays.
- CO 5. Nuclear energy sources, nuclear fission, and fusion.

## **Paper IX: Mathematical and Statistical Physics**

By the end of this Course students should be able to know about:

- CO 1. Study of different coordinate systems.
- CO 2. Differential equations and their applications.
- CO Experimental study of the Black body radiation spectrum.
- CO 4. Basic concepts in statistical physics and MB, BE, and FD statistics.

## **Paper X: Quantum Mechanics**

By the end of this Course students should be able to know about:

- CO 1. Interpretation of wave function and Schrodinger's wave equation
- CO 2. Quantum mechanical treatment of particles in a rigid box.
- CO 3. Schrodinger's equation for the hydrogen atom
- CO 4. Significance of quantum numbers.
- CO 5. Various operators in quantum mechanics.

## **Paper XI: Classical Mechanics**

By the end of this Course students should be able to know about:

- CO 1. Study of mechanics of particle and system of particle.
- CO 2. Coriolis force and effect of Coriolis force in nature
- CO 3. Applications of Long-range equations
- CO 4. Study of techniques of calculus of variation
- CO 5. The motion of a rigid body in space

## **Paper XII: Atomic and Molecular Spectra, Astronomy and Astrophysics**

By the end of this Course students should be able to know about:

CO 1. Doublet fine structure and electron spin-orbit interaction

CO 2. Effect of magnetic field on atomic spectra

CO 3. Study the Raman effect and its classical theory.

CO 4. Study of the origin of the solar system.

CO 5. Evidence of geological activities.

### **Paper XIII: Nuclear and Particle Physics**

By the end of this Course students should be able to know about:

CO 1. Need of accelerators and principal, construction, and working conditions of accelerators.

CO 2. Study of principal, construction, and working conditions of the nuclear detector.

CO 3. Study of the nucleus and its properties.

CO 4. Origin of cosmic rays and their types.

### **Paper XIV: Energy Studies and Material Science**

By the end of this Course students should be able to know about:

CO 1. Classification of energy resources and their alternatives.

CO 2. Solar energy from the satellite power station.

CO 3. Study of impurities in solids and defects in solids.

CO 4. Study of superconductivity.

CO 5. Introduction of nanoscience and nanotechnology

### **Paper XV: Electrodynamics and Electromagnetic Waves**

By the end of this Course students should be able to know about:

CO 1. Study of electrostatics and motion of charge particle.

CO 2. Electromagnetic inductions and their applications.

CO 3. Maxwell's equations and their physical significance.

CO 4. Study of skin depth conservation of energy in electromagnetic fields.

### **Paper XVI: Solid-State Physics**

By the end of this Course students should be able to know about:

CO 1. Study of crystalline and non-crystalline solids.

CO 2. Study of X-ray diffraction method.

CO 3. Elastic vibrations of the diatomic mono-atomic lattice

CO 4. Solid state devices and their applications.

CO 5. Study of metal semiconductors and insulators

*Salan*  
HEAD

DEPARTMENT OF PHYSICS  
KRISHNA MAHAVIDYALAYA,  
Rethare Bk; Shivnagar - 415108



*[Signature]*  
Principal  
Krishna Mahavidyalaya, Rethare Bk,  
Tal. Karad: 415 108 (M.S)