

Kalwan Education Society's  
**Arts, Commerce and Science College, Kalwan (Manur),**  
**Tal: Kalwan, Dist: Nasik**  
**Department of Physics**

Sr.No	Program	Program Objectives	Program Specific Outcomes
1	B.Sc Physics	To provide in depth knowledge of scientific and technological aspects of physics . To familiarize with current and recent scientific and technological developments . To enrich knowledge through through problem solving hand on activities, study visits projects etc . To train students in skills related to research education, industry and market. . To create foundation for research and development in Electronics. . To help students build up a progressive and successful carer in physics	<ol style="list-style-type: none"> <li>1 After completion of program students will be able to have in-depth knowledge of basic concept in Physics.</li> <li>2 Student will be able to apply the laws of Physics in real life situations to solve the problems.</li> <li>3 Students develop aptitude of doing research through undertaking small projects.</li> <li>4 Students will have set his foundation to pursue higher education in Physics.</li> <li>5 After completing the program student will have developed interdisciplinary approach and can pursue higher studies in subjects other than Physics.</li> </ol>

## Course Outcome

Sr. No.	Class	Course	Course Outcome
1	F.Y.B.Sc	1. Mechanics	<ol style="list-style-type: none"> <li>1. Demonstrate an understanding Newton's laws and applying them in calculation of the motion of simple system.</li> <li>2. Use the free body diagrams to analyse the forces on the object.</li> <li>3. Understand the concept of energy, work, power, the concepts of conservation of energy and be able to perform calculations using them.</li> <li>4. Understand the concepts of elasticity and be able to perform calculation using them.</li> <li>5. Understand the concepts of surface tension and viscosity and be able to perform calculations using them.</li> <li>6. Use of Bernoulli's theorem in real life problems.</li> <li>7. Demonstrate quantitative problem solving skills in all topics covered.</li> </ol>
		2. Heat and Thermodynamics	<ol style="list-style-type: none"> <li>1. Describe the properties of and relationships between the thermodynamic properties of a pure substance.</li> <li>2. Describe the ideal gas equation and its limitations.</li> <li>3. Describe the real gas equation.</li> <li>4. Apply the laws of thermodynamics to formulate the relations necessary to analyze a thermodynamic process.</li> <li>5. Analyze the heat engines and calculate thermal efficiency.</li> <li>6. Analyze the refrigerators, heat pumps and calculate coefficient of performance.</li> <li>7. Understand property 'entropy' and derive some thermo dynamical using entropy concept.</li> <li>8. Describe the types of thermometers and their usage.</li> </ol>
		3. Physics Principles and Applications	<ol style="list-style-type: none"> <li>1. To demonstrate an understanding of electromagnetic wave and its spectrum.</li> <li>2. Understand the types and sources of electromagnetic wave and application.</li> <li>3. To understand the general structure of atom, spectrum of hydrogen atom.</li> <li>4. To understand the atomic excitation and LASER principles.</li> <li>5. To understand the bonding mechanism in molecules and rotational and vibration energy levels of diatomic molecules.</li> <li>6. To demonstrate quantitative problem solving skills in all the topics covered.</li> </ol>

		4. Electromagnetic	<ol style="list-style-type: none"> <li>1. Demonstrate an understanding of the electric force, field and potential, and related concepts, for stationary charges.</li> <li>2. Calculate electrostatic field and potential of simple charge distributions using Coulombs law and Gauss's law.</li> <li>3. Demonstrate an understanding of the dielectric and effect on dielectric due to electric field.</li> <li>4. Demonstrate an understanding of the magnetic field for steady currents using. Biot - Savart's and Ampere's laws.</li> <li>5. Demonstrate an understanding of the magnetization of materials.</li> <li>6. Demonstrate quantitative problem solving skills in all the topics covered.</li> </ol>
		5. Practical	<ol style="list-style-type: none"> <li>1. Acquire technical and manipulative skill in using laboratory equipment, tools, and materials.</li> <li>2. Demonstrate an ability to collect data through observation and/or</li> <li>3. Demonstrate an understanding of the laboratory procedures including safety, and scientific methods.</li> <li>4. Demonstrate a deeper understanding of abstract concepts and theories gained by experiencing and visualizing them as authentic phenomena.</li> <li>5. Acquire the complementary skills of collaborative learning and teamwork in laboratory settings.</li> </ol>
	S.Y.B.Sc	Mathematical Methods in Physics I	<p>After the completion of this course students will be able be</p> <ul style="list-style-type: none"> <li>**Understand the complex algebra useful in physics courses</li> <li>**Understand the concept of partial differentiation.</li> <li>**Understand the role of partial differential equation in physics</li> <li>**Understand vector algebra useful in mathematics and physics</li> <li>**Understand the singular points of differential equation.</li> </ul>
		Electronics I	<p>Apply laws of electrical circuits to different circuits.</p> <ul style="list-style-type: none"> <li>** Understand the relations in electricity</li> <li>** Understand the properties and working of transistors</li> <li>** Understand the function of operational amplifiers</li> <li>** Design circuits using transistors and operational amplifiers.</li> <li>** Understand the Boolean algebra and logic circuits.</li> </ul>
		Oscillations, Waves and Sound	<ul style="list-style-type: none"> <li>** Solve the equations of motion for simple harmonic, damped, and forced oscillations.</li> <li>Understand the physics and mathematics of oscillations.</li> <li>** Formulate these equations and understand their physical content in a variety of applications.</li> <li>** Describe oscillatory motion with graphs and equations, and use these descriptions to solve problems of oscillatory motion.</li> <li>** Explain oscillation in terms of energy exchange, giving various examples.</li> </ul>

			<ul style="list-style-type: none"> <li>** Solve problems relating to undamped, damped and forced oscillations and superposition of oscillations.</li> <li>** Understand the mathematical description of travelling and standing waves.</li> <li>** Recognize the one-dimensional classical wave equation and solutions to it.</li> <li>** Calculate the phase velocity of a travelling wave.</li> <li>** Explain the Doppler effect, and predict in qualitative terms the frequency change that will occur for a stationary and a moving observer.</li> <li>** Define the decibel scale qualitatively, and give examples of sounds at various levels.</li> <li>** Explain in qualitative terms how frequency, amplitude, and wave shape affect the pitch, intensity, and quality of tones produced by musical instruments.</li> </ul>
		Optics	<ul style="list-style-type: none"> <li>** Acquire the basic concepts of wave optics</li> <li>** Describe how light can constructively and destructively interfere</li> <li>** Explain why a light beam spreads out after passing through an aperture</li> <li>** Summarize the polarization characteristics of electromagnetic waves</li> <li>** Appreciate the operation of many modern optical devices that utilize wave optics</li> <li>** ** Understand optical phenomena such as polarization, birefringence, Interference and diffraction in terms of the wave model.</li> <li>** Analyze simple examples of interference and diffraction phenomena</li> <li>** Be familiar with a range of equipment used in modern optics.</li> </ul>
		Practical's (S.Y.B.Sc)	<p>Whatever the students learned in their theory courses such as, electronics, waves oscillations and sound and optics. They need to verify this concept. This course will help to student to verify the concept from theory.</p>