



S.G.V.V.T's

## SRI GAVISIDDHESHWAR DEGREE COLLEGE KOPPAL

### DEPARTMENT OF PHYSICS

#### PROGRAMME OUTCOMES: B. Sc. PHYSICS

<b>Department of Physics</b>	After successful completion of three year degree program in physics a student should be able to;
<b>Programme Outcomes (PO)</b>	<ol style="list-style-type: none"><li>1. Demonstrate, solve and an understanding of major concepts in all disciplines of physics.</li><li>2. Solve the problem and also think methodically, independently and draw a logical conclusion.</li><li>3. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of Physics experiments.</li><li>4. Create an awareness of the impact of Physics on the society, and development outside the scientific community.</li><li>5. To inculcate the scientific temperament in the students and outside the scientific community.</li><li>6. Use modern techniques, decent equipment's and different modern in physical sciences.</li><li>7. To develop ability in students to appreciate how quantum mechanics able to solve some of the complex problem which cannot be explained using the classical Newtonian mechanics.</li><li>8. To undergo researches and to develop modern physics.</li><li>9. One of the best outcome is understanding of the launching of artificial satellites, spacecrafts, space landers to study astrophysics.</li><li>10. To have the knowledge about the development of modern physical science and economic growth of country.</li></ol>
<b>Programme Specific Outcomes (PSO)</b>	<ol style="list-style-type: none"><li>1. Gain the knowledge of Physics through theory and practical</li><li>2. Understand good laboratory practices and safety.</li><li>3. Develop research oriented skills.</li><li>4. Make aware and handle the sophisticated instruments/equipment.</li><li>5. Knowledge of industrial production and operation of industries.</li><li>6. Knowledge of hardware and networking in electronics circuits.</li></ol>

**Course Outcomes B.Sc. Physics****Semester-I**

<b>Course</b>	<b>Course Outcomes (CO)</b> After completion of these courses students should be able to;
<b>PHY101</b> Physics Paper-1 (Mechanics And properties Of Matter)	<ol style="list-style-type: none"><li>1. To know and understand the frames of reference and application to the mechanics.</li><li>2. To understand the conservation laws of energy and momentum and its applications.</li><li>3. To make familiar to the students about the elastic constants of materials theoretically which will be further verified experimentally.</li><li>4. To determine moment of inertia of the flywheel and some shapes of bodies.</li><li>5. To know the students about surface tension and viscosity properties of the liquids by both theoretically and experimentally.</li><li>6. To make students familiar about the Newton's law of gravitation and Kepler's laws of motion.</li></ol>
<b>PHYL1</b> (Physics Practicals-1)	<ol style="list-style-type: none"><li>1. To make familiar to the students to determine moment of inertia of the some regular bodies, such as discs, bar pendulum and flywheel.</li><li>2. To make familiar to the students about the determination of coefficient of The liquids such as water, oil etc.</li><li>3. To determine experimentally elastic constants such as rigidity modulus, Young's modulus by cantilever experiments.</li></ol>
<b>Course Outcomes B.Sc. Physics</b> <b><u>Semester-II</u></b>	
<b>PHY201</b> Physics Paper -2 (Heat, thermodynamics, waves and oscillations.)	<ol style="list-style-type: none"><li>1. To know the laws of thermodynamics and their applications such as heat engines, and refrigerating systems.</li><li>2. To know the effect of low temperatures on gases and to study the liquefaction of the gases.</li><li>3. To know the characteristics and types of sound waves, and determination of frequency and wavelength.</li><li>4. To design the auditorium halls and theaters for acoustics for the audible sound.</li></ol>
<b>PHYL2</b> (Physics practicals-2)	<ol style="list-style-type: none"><li>1. To find out unknown frequency of the tuning fork and natural resonant frequency of Helmholtz resonator.</li><li>2. To prove the laws of transverse vibrations using Sonometer and Melde's apparatus.</li><li>3. To know how to determine thermal conductivities of good and bad conductors of heat.</li><li>4. To know the determination boiling point of liquid experimentally.</li><li>5. To know the determination of specific heat of liquid and mechanical equivalent of heat experimentally.</li></ol>

**Course Outcomes B.Sc. Physics**  
**Semester-III**

<b>Course</b>	<b>Course Outcomes</b>
<b>PHY301</b> Physics paper-3 (Electricity &electromagnetic theory)	<p>After completion of the course the students will become familiar as follows</p> <ol style="list-style-type: none"> <li>1. To make the students familiar about different electrical elements, such as resistors, capacitors, inductors etc. and their connection.</li> <li>2. To understand network theorems, Thevinin's theorem and other theorems and apply to the electrical networks.</li> <li>3. To make the students familiar about vector calculus and its applications.</li> <li>4. To know the students about gauss theorem and it's applications to the electrostatics and applications.</li> <li>5. To know the students about Biot-Savert Law, Ampere's circuital laws and their application to calculate magnetic fields.</li> <li>6. To make the students to study about displacement current, Maxwell's equations.</li> <li>7. To know the students about the derivation of field equations using Maxwell's equations.</li> <li>8. To know the students about the production of electromagnetic waves, Hertz experiment and it's applications.</li> </ol>
<b>PHYL3</b> (Physics Practicals -3)	<ol style="list-style-type: none"> <li>1. To make the familiar about the electrical connections related to determination of BH, value using Helmholtz galvanometer.</li> <li>2. To know the students about dispersion of light through grating and prisms and make them to perform experiment to determine wavelength of light and dispersive power.</li> <li>3. To know the students Thevinin's, Norton and other electrical networks theorems and to verify them experimentally.</li> <li>4. To study the response of the AC of different frequencies through LCR, series and par. To parallel circuits experimentally.</li> <li>5. To study the response of AC filters, such as low ass and high pass filters experimentally.</li> <li>6. To measure the frequency of house hold AC current using Sonometer.</li> </ol>

**Course Outcomes B.Sc. Physics**  
**Semester-IV**

<b>Course</b>	<b>Course Outcomes (CO)</b> After completion of the course the students will become familiar as follows
<p style="text-align: center;"><b>PHY 401</b> (Optics And Theory Of Relativity)</p>	<ol style="list-style-type: none"> <li>1. To understand about wave theory of light and proof of laws of reflection and refraction, based on Huygens's construction of the wave front.</li> <li>2. To understand the interference of light, determination of wavelength using biprism and Newton's rings.</li> <li>3. To understand interference in thin films, formation of Newton rings, study and application of Michelson's interferometer.</li> <li>4. To know the light diffraction phenomenon through single slit, double slit, grating theory and determination of wavelength of light using grating.</li> <li>5. To know the polarization phenomenon of light, production of polarized light, Huygens' construction. Determination of specific rotation of the liquid solution using polarimeter.</li> <li>6. To know lens making, of eyepieces, telescope and calculation of resolving power of the optical instruments.</li> <li>7. To understand relativity theory, Derivation of relativistic formula, and calculation of relativistic energy.</li> </ol>
<p style="text-align: center;"><b>PHYL4:</b> (Physics Lab-4)</p>	<ol style="list-style-type: none"> <li>1. To understand the determination of the combination focal length of the lenses, using Newton's formula and to verify it.</li> <li>2. To understand the calculation of the radius of curvature of the plano convex lens by method of Newton's rings.</li> <li>3. To understand the determination of thin paper and calculation of wavelength of different colored lights.</li> <li>4. To understand the variation of the magnetic field away from the center of the circular coil using Stewart -Gee galvanometer.</li> <li>5. To understand the determination of the refractive index of the given liquid by liquid lens method.</li> <li>6. To understand the conversion of galvanometer into the ammeter, voltmeter and ohmmeter.</li> </ol>

**Course Outcomes B.Sc. Physics**  
**Semester-V**

<b>Course</b>	<b>Course outcomes (CO)</b> After completion of the course the students will become familiar as follows
<b>PHY 501</b> (Atomic And Molecular Physics)	<ol style="list-style-type: none"> <li>1. To understand basic properties of an atom, determination of charge and specific charge of an electron by Dempester, Millikan oil drop and Thomson's method.</li> <li>2. To understand different atomic models, such as Somerfield, Bohr and other atomic models.</li> <li>3. To understand the vector atomic model, quantum numbers and to study, ZeemanEffect, Stark effect experiments.</li> <li>4. To understand the study of molecular spectra, and electronic and vibrational spectra of the diatomic molecules.</li> <li>5. To understand the production techniques of laser, types of laser and its applications, and holography and study of Raman Effect.</li> </ol>
<b>PHYL5.1</b> (Physics Practicals 5.1)	<ol style="list-style-type: none"> <li>1. To understand the study of the input, output characteristics of PN diode, Zener diode and LED.</li> <li>2. To understand the study of half wave and full wave rectifier circuits, with and without filters.</li> <li>3. To understand the determination energy gap of the semiconductors, ad Zener diode as a voltage regulator.</li> <li>4. To understand the determination of characteristics of solar cell and fill factor.</li> <li>5. To understand the determination of Rydberg constant by spectrometer dispersion method.</li> <li>6. To understand the determination of characteristics of transistor CB configuration.</li> </ol>
<b>PHY 502</b> (Statistical Mechanics, Quantum mechanics & Electronics-I)	<ol style="list-style-type: none"> <li>1. To understand the study of statistical physics, and applications of MB, BE &amp; FD statistics and Gibb's paradox and its results.</li> <li>2. To understand the origin of quantum mechanics, matter waves, and Heisenberg uncertainty principles and experimental results.</li> <li>3. To understand the study of wave mechanics, derivation of Schrödinger's time independent equation and its applications.</li> <li>4. To become familiar about the classification of solids based on energy bands, electrical conductivity and semiconductors and Hall effect phenomenon.</li> <li>5. To become familiar with the study of PN junction, Zener diodes, LED, as rectifiers, voltage regulator and seven segment display using LED.</li> <li>6. To get the theoretical ideas of transistors, and their configurations, amplifying action, and biasing. The field effect transistors and their applications.</li> </ol>

<p align="center"><b>PHYL5.2</b> (Physics Practicals 5.2)</p>	<ol style="list-style-type: none"> <li>1. To become familiar with the determination Charge of an electron by dispersion method.</li> <li>2. To become familiar with the determination of specific charge of an electron by Thomson’s method.</li> <li>3. To understand the R.I of prism, and determination of wavelength of laser by using laser.</li> <li>4. To understand the verification of Child’s law.</li> <li>5. To understand the study of characteristics of transistor in CE configuration.</li> <li>6. To understand the determination of quantum charge ratio by using photo cell.</li> </ol>
<p><b>Course Outcomes B.Sc. Physics</b> <b><u>Semester-VI</u></b></p>	
<p align="center"><b>Course</b></p>	<p align="center"><b>Course outcomes (CO)</b> After completion of the course the students will become familiar as follows</p>
<p align="center"><b>PHY 601</b> (Nuclear Physics, Solid State Physics &amp; Astrophysics)</p>	<ol style="list-style-type: none"> <li>1. To understand the composition nucleus, nuclear forces, nuclear binding energy, and nuclear models.</li> <li>2. To understand the theory of radioactivity, radioactive decay theory, half-life and mean life of radioactive substance. And theory and working of the nuclear instruments.</li> <li>3. To understand the theory of nonconventional energy sources, such as wind energy, tidal energy, solar energy etc.</li> <li>4. To understand the crystal structure, X ray diffraction through crystal, Bragg’s law, Miller indices.</li> <li>5. To understand the theory of electrical and thermal conductivity of solids, specific heat, Einstein &amp; Debye’s theory of specific heats.</li> <li>6. To understand the theory of superconductivity, Meisner effect, type I &amp; type II superconductors. BCS theory and London’s penetration depth.</li> <li>7. To understand the theory of astrophysics, luminosity of stars, brightness, magnitude of stars and plotting of H_R diagram.</li> </ol>
<p align="center"><b>PHYL6.1</b> (Physics Practical- 6.1)</p>	<ol style="list-style-type: none"> <li>1. To understand the Poisson distribution nuclear counting statistics, inverse square law using G.M. counter.</li> <li>2. To understand the determination of the characteristic curves of field effect transistor, amplification factor transconductance, etc.</li> <li>3. To understand the construction and working of phase shift oscillator.</li> <li>4. To understand the determination of frequency response and band width of common emitter amplifier and emitter follower.</li> <li>5. To understand the construction and working of Hartley oscillator.</li> <li>6. To understand the seven segment display by using LED s.</li> </ol>

<p style="text-align: center;"><b>PHY602</b> (Materials Science &amp; Electronics-II)</p>	<ol style="list-style-type: none"> <li>1. To study the scope of materials science and their classification, applications.</li> <li>2. To study the bonding in materials, covalent bonding, metallic bonding and ionic bonding in solids.</li> <li>3. To study the theory on mechanical properties of materials, such as elasticity, hardness, fatigue, strength and hardness of the solids.</li> <li>4. To study thin films, methods of coating of the thin films and their applications</li> <li>5. To understand the theory of nanomaterials, their origin and properties such as strength, color, size effect and the applications of the nanomaterials.</li> <li>6. To understand the theory of basic logic gates, flip-flops, counters, their circuit diagram working and their applications.</li> <li>7. To understand the theory of radio wave propagation, modulation and demodulation of the radio waves and their propagation through the space and super heterodyne receiver.</li> </ol>
<p style="text-align: center;"><b>PHYL6.2</b> (Physics Practical- 6.2)</p>	<ol style="list-style-type: none"> <li>1. To understand the determination of characteristics of the Geiger –Muller counter, and its operating voltage.</li> <li>2. To understand the determination of inductance of the coil by Anderson's and Maxwell bridges.</li> <li>3. To determine the inter-planar spacing, lattice constant and parameter, by using X-ray diffraction pattern.</li> <li>4. To understand the study of basic logic gates, by constructing and verification of truth tables.</li> <li>5. To understand the construction and verification of truth tables of half and full adders</li> <li>6. To become student familiar with the construction and verification of truth tables for De-Morgan's theorem.</li> </ol>