

- **Course Outcomes (Cos):** Acquire knowledge and understanding of fundamental principles of modern physics relevant to problems of physics. Acquire knowledge of basic principles of Quantum Physics and Relativity. Acquire knowledge of the basic physics of a collection of particles and the emergent macroscopic properties. Apply principles of quantum and statistical physics to understand properties of semiconducting and magnetic materials Acquire knowledge of new emerging areas of Science and Technology like nanomaterials Analyze the intensity variation of light due to Polarization, interference and diffraction
- To aware of limits of classical physics & to apply the ideas in solving the problems in their parent streams
- Formulate general mechanics parameters and distinguish between central and no central forces
- Explain types of waves and interference of light
- Derive thermodynamic parameters and apply fundamental laws to solve thermodynamic problems

T.Y.B.sc.		
Subject Code	Subject Name	Subject Outcome
91213	Mathematical Methods in Physics I	<ul style="list-style-type: none"> • Determine gradient, divergence and curl of scalar and vector fields, and its physical significance
91223	Solid State Physics	<ul style="list-style-type: none"> • Classify solids on the basis of band theory and to calculate conductivity of semiconductors • To analyze the structural properties of elemental solids
91233	Classical Mechanics	<p>Understand basics laws of motion of Physics.</p> <p>The students will introduce about the forces, angular momentum and knowledge about the Constraint. The course will give knowledge about the general parameter like velocity, acceleration</p>
91243	Atomic and Molecular Physics	<p>.Describe the atomic spectra of one and two valance electron atoms. Explain the change in behavior of atoms in external applied electric and magnetic field. Explain rotational, vibration, electronic and Raman spectra of molecules. Describe electron spin and nuclear magnetic resonance spectroscopy and their applications.</p>

91253	Computational Physics	. Develop a greater understanding of the issues involved in programming language design and implementation. Develop an in-depth understanding of functional, logic, array etc.
Elective Code	Renewable Energy Sources	Describe the environmental aspects of non-conventional energy resources. In Comparison with various conventional energy systems, their prospects and limitations. Know the need of renewable energy resources, historical and latest developments. Describe the use of solar energy and the various components used in the energy production with respect to applications like - heating, cooling, desalination, power generation, drying, cooking etc. Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications. Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications 6. Compare Solar, Wind and bio energy systems, their prospects, Advantages and limitations. Acquire the knowledge of fuel cells, wave power, tidal power and geothermal principles.
91214	Classical Electrodynamics	Convenient description of reality is in terms of fields. These fields have a physical reality of their own, e.g., they carry energy and momentum. The fields evolve according to certain partial differential equations with appropriate initial conditions/boundary conditions. • The microscopic forces except gravity are all described in fact by a pair of electric and magnetic fields acting between charges and currents. The charges produce fields and the fields in turn affect charges. • Often, fields leave the charges to travel far in terms of waves. These waves can undergo reflection, refraction, interference and diffraction in various media. • In vacuum, these waves can travel very fast (in fact, with the maximum possible speed) and are thus relativistic. • In media, the collective behaviour of charges leads to an effective/averaged description whereby the forces are screened/enhanced/modified into something entirely new. The waves disperse in a frequency dependent way and their effective speed of propagation also becomes frequency dependent. • At temperatures much below their frequencies, these waves start behaving like particles thus leading to quantum behaviour. • When the

		reverse effect of particles behaving like waves is taken into account, one then forms stable bound states/novel phases (like atoms, molecules, solids, liquids etc.)
91224	Quantum Mechanics	<ul style="list-style-type: none"> • Explain fundamentals of quantum mechanics and apply to one dimensional motion of particle presentations. To solve the classical and wave mechanics problems • To formulate and solve the engineering problems on Electromagnetism Deduce Schrodinger's equations and apply it to one quantum mechanical problem.
91234	Thermodynamics and Statistical Physics	. This course in statistical mechanics provides the basic idea of probability to the students. There are ways of calculating probability for various statistical systems of particles. Students will study basic ideology of phase space, microstate, macrostate. The objective is to apply the principles of probability in distribution of particles in various systems and to calculate thermodynamic probability. The course gives the insight of postulates of statistical physics. Students will learn the different types of statistics distribution and particles. They will learn which particles follow which statistics and why. The aim is to apply these statistical distribution in real life problems and understand their problems. .
91244 91254 91254	Nuclear Physics Electronics/Advanced Electronics Physics of Nanomaterials	Acquire knowledge in the content areas of nuclear and particle physics, focusing on concepts that are commonly assessed on the physics subject GRE. Develop and communicate analytical skills in subatomic physics. Develop familiarity with nuclear and particle physics, facilitating informed decisions as students pursue research projects, internships, careers, and graduate study. Learn about topics of interest independently, and subsequently organize and present information to each other and to a group, at an appropriate level for their target audience. To understand the operation of the various bias circuits of MOSFET and Analyze and design MOSFET bias circuits. To understand the operation and design of multistage To understand the operation and design of transformer coupled various types of power amplifier circuits. To understand the effects of negative feedback on. amplifier circuits. To analyze the different RC and LC oscillator circuits to determine the frequency of

		oscillation emphasize the importance of nanotechnology in healthcare To appreciate the role of nanotechnology in electronics Describe few methods of synthesis of nanoparticles. And Applications characterization techniques. Use and
S.Y.B. Sc.		
Subject Code	Subject Name	Subject Outcome
81211	Mathematical Methods in physics	<ul style="list-style-type: none"> Determine gradient, divergence and curl of scalar and vector fields, and its physical significance
812A1	Electronics	<ul style="list-style-type: none"> To understand operation of semiconductor devices. 2. To understand DC analysis and AC models of semiconductor devices. To apply concepts for the design of Regulators and Amplifiers To verify the theoretical concepts through laboratory and simulation experiments. To implement mini projects based on concept of electronics circuit concepts. To understand number representation and conversion between different representation in digital electronic circuits. 2. To analyze logic processes and implement logical operations using combinational logic circuits. 3. To understand characteristics of memory and their classification.
: 81212	Oscillations, Waves and Sound	<p>Properties of waves: Energy: Like moving objects, moving waves carry energy from one place to another Energy is not transmitted by the media that support waves, but by the waves themselves. EM waves from sun to earth have power of $1\text{KW}/\text{m}^2$. Plants are supported on this energy and we are supported by plants.</p> <ul style="list-style-type: none">
81222	Optics	The main objective of this subject is to aware the students about various phenomenon of waves and optics. First unit of deals with the Fourier analysis and Fourier transformation. The second deals with the matrix method in order to explain various phenomenons. The third unit describe the Phenomenon like interference phenomenon

F.Y.B. Sc.		
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Paper I	Mechanics , Heat and Thermodynamics	<ul style="list-style-type: none"> The students will introduce about the forces, angular momentum and knowledge about the Constraint. The course will give knowledge about the general parameter like velocity, acceleration. The course provides the students about the knowledge of M.I.
Paper II	Physics Principles and Applications Electromagnetic	<ul style="list-style-type: none"> To apply the knowledge of mathematics, science and engineering fundamentals to model the energy conversion phenomenon. To identify and formulate power production based on the fundamentals laws of thermal engineering. To instill upon to envisage appropriate experiments related to heat engines. To investigate the effectiveness of energy conversion process in mechanical power generation for the benefit of mankind. To appreciate concepts learnt in fundamentals laws of thermodynamics from which learning ideas how to sustain in energy crisis and think beyond curriculum in the field of alternative and renewable sources of energy. To communicate effectively the concepts of internal combustion engines and try to think beyond curriculum in alternative sources of energy To understand operation of semiconductor devices.