DEPARTMENT OF PHYSICS

S.No.	Course Code	Course Title	Course Outcomes (CO)
1.	PS120	Paper I Mechanics and Ocillations	On completion of this course, the students will be able to: **CO1:** Develop understanding on the concept of scalar, vector fields, Gradient, Divergence and curl of vector fields. **CO2:** Able to apply the Gauss, stokes and Greens theorems in related problems. **CO3:** Identify and apply the laws of mechanics along with the necessary mathematics for solving numerically. **CO4:** Describe Newton's laws of motion and conservation principles. **CO5 :** Able to articulate and describe relative motion, Inertial and non-inertial reference frames. **CO4:** Understand the Mechanics of rigid bodies, concept of Gyroscope and establish the rotational Kinematic relations. **CO5:** Explain the Gravitational potentials and fields, central forces and Kepler's laws. **CO6:** Differentiate between Galilean and Lorentz transformations. **CO7:** Describe the Michelson-Morley Experiment, Postulates of special theory of relativity. **CO8:** Understand and derive the Kepler's laws. **CO9:** Understand physical characteristics of SHM and obtaining solution of the oscillator using differential equations and Lissajous figures **CO10:** Calculate logarithmic decrement, relaxation factor and quality factor of a harmonic oscillator.

2.	**PS220**	**Paper-II Thermal Physics**	On completion of this course, the students will be able to: **CO1:** Recall the laws of gasses and Kinetic theory of gasses. **CO2**: Analyse the different transport Phenomena **CO3:** Understand the thermodynamic laws and entropy **CO4:** Derive the equations of thermodynamic potentials and establishes the relation among them. **CO5**: Explain the Joule-Kelvin effect and methods of production of low temperature. **CO6:** Distinguish between adiabatic and Joule- Kelvin effect. **CO7:** Understand the Planks law, Wein's law and Reyleigh' Jeans Law and Stefans law and establishes relation among them. **CO8**: Describe the experimental setups of optical pyrometers. **CO9:** Understand the concepts of phase space, Ensembles and postulates of statistical mechanics. **CO10:** Differentiate among Maxwell's-Boltzmann, Bose-Einstein, Fermi-Dirac distribution laws
3.	**PS320**	**Paper – III Electromagnetic Theory**	At the end of the course the students will be able to **CO1:** Recall the concepts of basics laws of electro statics and Magneto statics. **CO2:** Derive the Gauss laws and applies the Gauss law in Physics problems. **CO3:** Able to apply the Ampere's law in Straight, circular and solenoidal currents. **CO4:** Understand the working principle of Ballistic Galvanometer. **CO5:** Explain the Faraday's, Lenz's laws and concept of self, mutual Inductions and continuity Equation. **CO6:** Derive the Maxwell's equations in Vacuum and dielectric medium. **CO7:** Draws the current and voltage response of charging and discharging of LR, CR, RC and LCR Circuit.

			CO8: Understand the concepts of passive, active elements, power series and network models. **CO9:** Explain the different network theorems and importance.
4.	**PS420**	**Paper – IV – Waves and Optics**	On the completion of this course, the students will be able to; **CO1:** Understand the fundamental of waves and transverse and longitudinal vibrations of bars **CO2:** Understand the properties and applications of light like reflection, refraction, interference, diffraction etc **CO3**: Apply the principles of wave motion and superposition to explain the Physics of polarization, interference and diffraction. **CO4:** Understand the applications of interference in design and working of interferometers. **CO5:** In the laboratory course, student will gain hands-on experience of using various optical instruments and making finer measurements of wavelength of light using Newton Rings experiment, Fresnel Biprism etc. Resolving power of optical equipment can be learnt firsthand. **CO6:** Distinguish between Fresnel and Fraunhofer diffraction. **CO7**:Explain the different methods of polarization. **CO8:**Describe the experimental setup and working principle of Babinet's compensator.
5.	**PS520**	**DSE-VA Modern Physics**	The students will be able to **CO1:** Recall the limitations of Bohr's atomic model and understand the Concepts of Atomic spectra, types of molecular spectra, Vector atom model Stern-Gerlach Experiment and quantum numbers associated with coupling schemes.

			CO2: Distinguish among Zeeman, Paschen-Back and stark effect and understand experimental arrangement of Raman Spectra and its applications. **CO3:** Understand the central concepts of quantum mechanics: wave functions, momentum and energy operator, the Schrodinger equation, time dependent and time independent cases, probability density and the normalization techniques, basic postulates of quantum mechanics. **CO4:** Understand the De-Broglie Hypothesis and Heisenberg Uncertainty Principle. **CO5:** Understanding the properties of nuclei like density, size, binding energy, nuclear forces and structure of atomic nucleus, liquid drop model and nuclear shell model and mass formula. **CO6:** Ability to calculate the decay rates and lifetime of radioactive decays like alpha, beta, gamma decay, Neutrinos and its properties and role in theory of beta decay. **CO7:** Explain different types of particle detectors. **CO8:** Differentiate between Crystalline and amorphous substances, structures and understand the concepts of lattice, unit cell, miller indices, and diffraction of X-rays by crystalline materials. **CO9**: Analyze the simple crystal structures. **CO10**: Explain the characteristics of crystals with different bondings**.**
6.	**PS 521**	**DSE-VB: Computational Physics**	On completion of this course, the students will be able to: **CO1:** Understand the different concepts of Programming in 'C'. **CO2:** Analyse the different numerical methods. **CO3:** Able to give numerical solutions of ordinary differential equations. **CO4:** Explain the different Algorithms and Monte Carlo simulations.

7.	**PS620**	**DSE-VIA Electronics**	After completion of the course, the students will be able to; **CO1:** Understand the energy bands in solids and type of diodes. **CO2:** Understand different types of transistors, amplifier and oscillators. **CO3:** Explain special devises i.e FET, UJT, SCR, etc… **CO4:** Applies the logic gates in simple electronic circuits. **CO5:** Understand the binary number system, hexa decimal and their conversion.
8.	**PS621**	**DSE-VIB Applied optics**	After the completion of this course, the learner will be able to: **CO1:** Classifies the different types of laser systems. **CO2:** Understand the basic principles and applications of holography. **CO3:** Explain the Fourier and non-linear optics **CO4:** Understand the different types of optical fibres and their structures.
9.	**PS321**	**SEC1: Experimental methods and error analysis**	On completion of this course, the students will be able to: **CO1:** Understand the different measurement methods, least count, accuracy and types of errors. **CO2:** Understand the errors of computation and minimising methods. **CO3:** Understand the mean, mode and standard deviation. **CO4:** Explain the Binomial, passion, normal distributions and chi square test.
10.	**PS421**	**SEC2: Digital Electronics**	After completion of the course, the students will be able to; **CO1:** Distinguish between intrinsic and extrinsic semi-conductors, P-type and N-type semiconductors. **CO2:** Able to apply rectifiers with and without filters in electronic circuits. **CO3:** Analyses different types amplifiers. **CO4:** Explain the construction and characteristics of photo diode, Photo transistors, LED, LCD, SCR and UJT. **CO5**: Understand the concept of feedback oscillators and digital systems.