DEPARTMENT OF PHYSICS

Programme: B Sc. (Physics)

Statement of Programme Specific Outcomes (PSOs)

By the end of this course, the students will be able to:

1. Demonstrate, solve and an understanding of major concepts in all disciplines of physics.
2. Solve the problem and also think methodically, independently anddraw a logical conclusion.
3. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of Physics experiments.
4. Create an awareness of the impact of Physics on the society, and development outside the scientific community.
5. To inculcate the scientific temperament in the students and outside the scientific community.
6. Use modern techniques, decent equipments and Phonics software"s

Statement of Course Outcomes (COs)

B.Sc.Course: SEM-I Paper -1(Properties of Matter and Mechanics)

By the end of this course, the students will be able to:

1. Know Elastic and Plastic properties of material
2. To study relationship between Y, η and K
3. To determine Young's Modulus of Cantilever
4. To study Torsional Pendulum and Maxwell Needle
5. To streamline and turbulent flow of liquid
6. To know coefficient of viscosity
7. To study Bernoulli's theorem and its applications
8. To know Poiseuilli's formula
9. To know about surface tension property of water
10. To know surface energy by Jaeger's method
11. To understand Newton's Laws of motion
12. To gain the knowledge of motion in central force field
13. To know the center of mass system

B.Sc.Course: SEM-I Paper -2(Electrostatics, Time Varying fields and Electric Current)

By the end of this course, the students will be able to:

1. To study Coulombs law in vacuum in vector form,
2. To understand terms electric field intensity, electric potential, electric field intensity

3. To study electric dipole and its property
4. To understand conservative nature of electric field
5. To know what is dielectric material
6. To know difference between polar and non-polar molecule
7. To study Claussius-Mossitti equation
8. To study capacitance property of capacitor
9. To study working and application of transformer
10. To use complex number in studying a. c. current
11. To study LR, CR, LCR circuit using j-opertator method

B.Sc. Course: SEM-II Paper -1(Oscillations, Kinetic theory of gases and Thermodynamics)

By the end of this course, the students will be able to:

1. To get acquainted with linear and angular S.H.M.
2. They study forced oscillation with one degree of freedom
3. Study differential equation of forced oscillation
4. They know how transportation takes place in gases
5. Understand Van der wall's equation
6. Study Carnot's cycle
7. Study laws of thermodynamics
8. Know Maxwell's equation and its application

B.Sc. Course: SEM-II Paper -2(Gravitation, Astrophysics, Magnetism, Magneto statics)

By the end of this course, the students will be able to:

1. Know Kepler's law of Planetary motion
2. Study Gravitational field and Gravitational potential
3. They know about gravitational self energy
4. To measure distance of planet
5. Measure mass of sun and planet
6. Know concepts of cosmological theories
7. Study diamagnetic, paramagnetic and ferromagnetic properties
8. Study concept of magnetic field, Lorentz force equation,
9. They know magnetic dipole moment, angular momentum and gyro magnetic ratio,

B.Sc. Course: SEM-III Paper -1(Sound Waves, Applied Acoustics, Ultrasonic and Power Supply)

By the end of this course, the students will be able to:

1. They understand waves, group velocity, phase velocity, their relation, standing waves, harmonics, quality of sound,
2. Know about human ear construction and its response, limit of human audibility, intensity and loudness of sound, musical instruments and musical scale
3. Understand transducers and their characteristics, recording and reproduction of sound.

4. Understand acoustic of building, reverberation Sabine's formula, factors affecting acoustics of building and requirement of good acoustics.
5. Understand ultrasonic waves, production and their properties, piezoelectric effect and generator.
6. Understand magnetostriction effect and oscillators, applications of ultrasonic waves.
7. Understand half wave and full wave bridge rectifiers, filters
8. Understand difference between regulated and unregulated power supply, line and load regulation, voltage stabilization, working of zener diode as voltage regulator, IC regulator and voltage regulation.

B.Sc. Course: SEM-III Paper -2(Physical Optics and Electromagnetic Waves)

By the end of this course, the students will be able to:

1. Understand phenomenon of interference of light, Newton's ring arrangement and its applications.
2. Understand Michelson's interferometer, Fabry- Parrot interferometer and its applications.
3. Understand phenomenon of diffraction of light, Fresnel and Fraunhoffer diffraction.
4. Understand Rayleigh's criteria of resolution and resolving power of grating
5. Introduction to polarization phenomenon, to understand Brewster's law, scattering of light and blue colour of sky.
6. Understand uniaxial and biaxial crystals, positive and negative crystals, ordinary and extra ordinary rays.
7. Understand Nicol prism, its construction and application.
8. Understand double refraction, construction of half and quarter wave plate
9. Introduction to electromagnetic spectrum,

B.Sc. Course: SEM-IV Paper -1 (Solid State Physics, X-ray and Laser)

By the end of this course, the students will be able to:

1. Introduction to crystal structure, periodicity, lattices, and its types and basis lattice planes
2. Understand Bravais lattices, packing fraction, coordination number, inter planar distances.
3. Introduction to X-rays, students understand discrete and continuous X-ray spectra and its main features, characteristics of X-ray spectra
4. Understand Duane- Hunt law, X-ray emission spectra, Mosley law and its importance and applications.
5. Understand Lau's theory of X-ray diffraction, Bragg's law and Bragg's diffraction conditions for direct and reciprocal lattice, Laue's pattern
6. Students understand Bragg's spectrometer and it's applications
7. Students are introduced to Laser, Einstein's relation, absorption, spontaneous and stimulated emission
8. They understand population inversion, optical pumping, characteristics of laser beam, three level, four level laser system.

B.Sc. Course: SEM-IV Paper -2(Solid State Electronics and Molecular Physics)

By the end of this course, the students will be able to:

1. Students are introduced to light emitting diode, solar cell, photovoltaic cell
2. Understand graphical analysis in CE mode, hybrid parameters, equivalent circuit at low frequency in CE mode, thermal runaway, stabilization, heat sink, stability factor and bias stabilizing circuits.
3. Students understand construction and working principle of JFET, difference between BJT and JFET, characteristics of JFET, it's parameters, and use of JFET as an amplifier and advantages of JFET over BJT.
4. Students are introduced to MOSFET, it's types, construction and working. Characteristics of MOSFET and special features of MOSFET.
5. Students understand quantization of vibrational and rotational energies, types of molecules based on inertia, rigid diatomic molecules, intensity distribution in rotational levels.
6. Understand diatomic molecules as harmonic oscillator, rotational- vibrational spectraand Born-Oppenheimer approximation.
7. Students are introduced to Raman effect, classical and quantum explanation , its experimental set-up.
8. Understand Raman spectra and molecular structure, applications of Raman effect, electronic spectra, dissociation energy, Frank- Condon principle.

B.Sc. Course: SEM-V Paper -1(Atomic Physics, Free Electron Theory)

By the end of this course, the students will be able to:

1. Revise Bohr's model, Somerfield model and Chadwick model to study structure of atom
2. Understand Vector atom model
3. Understand and Differentiate between Normal and Anomalous Zeeman Effect
4. Understand Stark effect
5. Understand electrical and thermal conductivity
6. Understand Fermi energy and Fermi temperature
7. Understand band theory of solids
8. Differentiate between conductor, semiconductor and insulator
9. Understand Boltzmann's entropy relation
10. Differentiate between accessible and inaccessible estates
11. Differentiate between macro and micro states
12. Distinct between mean, r.m.s. and most probable values
13. Understand and apply Bose-Einstein statistics to black body radiation
14. Understand and apply Fermi- Dirac Distribution to free electrons in metal

B.Sc. Course: SEM-V Paper -2(Quantum Mechanics, Nanomaterials, Nanotechnology)

By the end of this course, the students will be able to:

1. Explain failure of Classical Mechanics
2. Understand development of Quantum Mechanics
3. Understand and explain particle duality
4. Understand concept of wave packet and uncertainty principle
5. Understand difference between bulk material and nonmaterial
6. Understand 0D, 1D, 2D and 3D dimensions of nanomaterial
7. Understand bottom up and top down approaches of synthesis of nonmaterial
8. Understand and apply methods of synthesis of nanomaterial
9. Determine size of nanoparticles
10. Understand to characterize nonmaterial by SEM and TEM

B.Sc. Course: SEM-VI Paper -1(Relativity, Nuclear Physics and Biophysics)

By the end of this course, the students will be able to:

1. Understand frame of reference
2. Understand Galilean and Lorentz transformation
3. Explain postulates of special theory of relativity
4. Study Velocity addition theorem
5. Understand Mass –Energy relation
6. Explain Liquid drop model
7. Understand chain reaction and Nuclear reactors
8. Understand and differentiate between α, β and γ decay
9. Understand principles of ECG, EEG, ERG, EMG and Sonography and their application
10. Understand basic principles of colorimeters, spectrophotometer, pH meter and their application

B.Sc. Course: SEM-VI Paper -2(Electronics, Fiber Optics, Communication and Digital Electronics)

By the end of this course, the students will be able to:

1. Understand and classify amplifiers
2. Understand Oscillators, its types and applications
3. Understand principle of optical fiber
4. Differentiate between types of optical fibe
5. Understand applications of Optical fiber
6. Understand communication and modulation
7. Understand and differentiate between amplitude and frequency modulation
8. Understand advantages and disadvantages of amplitude and frequency modulation
9. Understand Unitary system
10. Apply logic gates
11. Verify De-Morgan's Theorem