PG OUTCOMES

SEMESTER I

COURSE TITLE: MATHEMATICAL PHYSICS

COURSE CODE: PAE 101

COURSE OUTCOMES On succcessful completion of course student will be able to

1. Solve differential equations like Legendre, Bessel and Hermite that are common in physical sciences.
2. Solve the different partial differential equations encountered in physical problems and draw inferences from solutions.
3. Solve transfer functions in Instrumentation using Laplace transforms.
4. Apply Fourier transforms in Holography.
5. Apply Matrices in the study of electrical circuits, Quantum Mechanics and Optics.
6. Apply the knowledge of Tensors to understand phenomenon like stress and strain.

COURSE TITLE: CLASSICAL MECHANICS

COURSE CODE: PAE 102

COURSE OUTCOMES On succcessful complétion of course student will be able to

:

1. Understand basic mechanical concepts related to discrete and continuous mechanical systems and also Cyclic coordinates and conservation theories
2. Apply Newton's laws of motion and conservation law of energy, linear and angular momentum to solve advanced problems involving the dynamic motion of classical mechanical system.
3. Solve the equations of motion for complicated mechanical systems using the Lagrangian and Hamiltonian formulations of classical mechanics.
4. Explore the application of Hamilton's equations in solving the equation of motion of a particle in a central force field, projectile motion of a body.

COURSE TITLE: QUANTUM MECHANICS

COURSE CODE: PAE 103

COURSE OUTCOMES On succcessful completion of course student will:

1. Understand and explain the differences between classical and quantum mechanics
2. Learn operator formalism for observables and basic commutation relations.
3. Solve Schrödinger equation for simple potentials like linear Harmonic oscillator and Hydrogen atoms.
4. Understand the space, time and displacement symmetries.

5. Evaluate the eigen values of L and J vectors.
6. Evaluate CG coefficients for different values of total angular momentum vector.

COURSE TITLE: SOLID STATE PHYSICS

COURSE CODE: PAE 104

COURSE OUTCOMES On succcessful completion of course student will:

1. Understand different types of crystal structures in terms of the crystal lattice and the basis of constituent atoms.
2. Understand the theory of X-ray diffraction in the reciprocal lattice (k-space) formalism.
3. Apply the theory of lattice vibrations (phonons) to determine thermal properties of solids.
4. Study the problem of electrons in a periodic potential, examine its consequence on the band-structure of the solids.
5. Gain knowledge about the experimental techniques for crystal growth from solution and melt.

SEMESTER II

COURSE TITLE: ELECTROMAGNETIC THEORY

COURSE CODE: 201

COURSE OUTCOMES On succcessful completion of course student will:

1. Acquire knowledge on general wave equation using Maxwell's equations and able to derive Laplace equations for electrostatic potential in Cartesian, spherical and cylindrical coordinates
2. Analyze scalar and vector magnetic potentials and the propagation of EM waves in different media
3. Understand the propagation of EM waves in bounded and unbounded media & Boundary conditions for EDB and H.
4. Understand poynting theorem and its physical significance.
5. Analyze Fresnel relations- Reflection (R) and Transmission (T) coefficients. Brewster's angle.
6. Have an idea on the concept of EM radiation of Inhomogeneous wave equation, harmonically oscillating source.

COURSE TITLE: STATISTICAL MECHANICS

COURSE CODE: 202

COURSE OUTCOMES On succcessful completion of course student will:

1. Gain knowledge about classical and quantum statistical mechanics, including Boltzmann, Fermi-Dirac, and Bose-Einstein statistics.
2. Apply the formalism of statistical mechanics and probability theory to derive relations between thermo dynamical quantities
3. broad understanding of Statistical Mechanics, and show a critical awareness of the significance and importance of the topics, methods and techniques.
4. Understand the physical statistics and its relation to information theory and able to Solve statistical mechanics problems for simple non-interacting systems,
5. Understand the phase transitions and universality in second order phase transitions.

COURSE TITLE: QUANTUM MECHANICS II

COURSE CODE: PAE 203

COURSE OUTCOMES On succcessful completion of course student will:

1. Understand the kinematics of scattering process.
2. Evaluate the partial wave analysis using Born approximation method.
3. Apply time Independent perturbation theory for non degenerate case.
4. Gain knowledge on WKB approximation method to study alpha decay.
5. Remember time dependent perturbation theory
6. Analyze the interaction of an atom with electromagnetic radiation and the relativistic quantum mechanics using Klein Gordon equation
7. Explore the properties of gamma matrices.

COURSE TITLE: ELECTRONICS

COURSE CODE: PAE 204

COURSE OUTCOMES On succcessful completion of course student will:

1. Acquire knowledge of operational amplifier circuits and their applications.

2. Gain knowledge and evaluate the Boolean expressions, combinational logic circuits and simplifications using karnaugh maps.
3. Analyze the operation of decoders, encoders, multiplexers, adders and subtractors.
4. Understand the working of latches, flip-flops, designing registers, counters, a/d and d/a converters.
5. Design and Analyze synchronous and asynchronous sequential circuits.
6. Interpret the architecture, instruction set and also practice the basic programs of 8085 microprocessor.

SEMESTER III

COURSE TITLE: MODERN OPTICS

COURSE CODE: P 301 T

COURSE OUTCOMES On succcessful completion of course student will:

1. Gain knowledge on laser rate équations for Two, Three, Four-level laser systems.
2. Understand Einstein relations for émission and absorption of radiation
3. Gain knowledge on classification of laser systems
4. Gain knowledge on application of various laser systems
5. Understand basic principles of holography and its applications
6. Understand the concept of recording and reconstruction of a hologram
7. Understand the fourier transforming properties of lenses
8. Understand the applications of non-linear optics.

COURSE TITLE: ADVANCED SOLID STATE PHYSICS

COURSE CODE: P 302 T

COURSE OUTCOMES On succcessful completion of course student will:

1. Acquire knowledge about different experimental approaches in the study of Fermi

surfaces in different materials. .
2. Understand piezo, pyro and Ferro electricity, ferroelectric domains and hysteresis.
3. Understand basic theories of magnetic materials like ferromagnetism, ferrimagnetism, anti-ferromagnetism.
4. Acquire basic knowledge on (low temperature) superconductivity in type I and type II super conductors, and also different theoretical approaches to super conductivity (BCS).
5. Understanding of various phenomena related to super conductivity, such as the Meissner effect, flux quantization, Giæver- and Josephson tunneling.

COURSE TITLE: ELECTRONIC INSTUMENTATION

COURSE CODE: P 303 T/EI

COURSE OUTCOMES On succcessful completion of course student will:

1. Measure various electrical parameters with accuracy, precision, resolution.
2. Design different types of amplifiers and filters.
3. Select specific instrument for specific measurement function.
4. Understand principle of operation, working of different electronic instruments like digital multi meter, vector voltmeter, and power factor meter.
5. Analyze the functioning, specification, and applications of signal generators and signal analyzing instruments.
6. Understand working & principle of various signal analyzers like wave analyzer, distortion analyzer & spectrum analyzers
7. Test and troubleshoot electronic circuits using various electronic measuring instruments.

COURSE TITLE: DIGITAL LOGIC CIRCUITS

COURSE CODE: P 304A/T/EI

COURSE OUTCOMES On succcessful completion of course student will:

1. Acquire the basic knowledge of digital logic levels and its application.
2. Gain knowledge on digital arithmetic operations for algebraic simplification.
3. Understand digital IC terminology and characteristics of TTL, MOS,ECL families.
4. Design Decoders, Encoders, Digital multiplexers, Adders and Subtractors, Binary comparators, Latches and Flip-Flops
5. Design registers and Counters, A/D and D/A converters.
6. Understand, analyze and design of programmable logic devices and VHDL
7. Identify basic requirements for a designing a combinational logic circuit
8. Identify and prevent various hazards and timing problems in a digital circuit.

SEMESTER IV

COURSE TITLE: NUCLEAR PHYSICS

COURSE CODE: P 401 T

COURSE OUTCOMES On succcessful completion of course student will:

1. Understand Nuclear Force And Nuclear Models
2. Analyze the semi empirical mass formula and its applications using liquid drop model and shell model
3. Understand the concept of Nuclear Decay Processes
4. Interpret the Classification of nuclear reactions
5. Understand the Classification of elementary Particles and their Quantum Numbers

COURSE TITLE: SPECTROSCOPY

COURSE CODE: P 402 T

COURSE OUTCOMES On succcessful completion of course student will:

1. Understand the basic principles of atomic absorption spectroscopy.
2. Interpret the working principles and outline the atomic absorption spectroscopy device.
3. Understand Micro-wave, IR and RAMAN spectroscopy and interpret the data from these measurements.
4. Understand the basic principles of NMR and ESR spectroscopy and its applications

COURSE TITLE: INTRUMENTATION FOR MEASUREMENT AND DATA TRANSMISSION

COURSE CODE: PEI 403 T/EI

COURSE OUTCOMES On succcessful completion of course student will:

1. Understand the Classification of transducers - Active and Passive transducers, Electrical transducers, Displacement transducers, Digital transducers.
2. Understand the operation of strain gauge, Types of strain gauges, Strain gauge circuits, Calibration of strains gauges. Strain gauge load cell.
3. Cateogorise the different kinds of Temperature, Pressure measurement devices and apply them in various electronic devices.
4. Analyze the different types of flow meters like Head type flow meters-Orifice meter, Venturi Tube, Pitot tube, Rotameter, Anemometer, Electromagnetic flow meter - Ultrasonic flow meter.
5. Understand open loop control & closed loop control systems
6. Gain the knowledge on working of dc and ac servomotors and use them in applications requiring precise position control.

7. Analyze the methods of data transmission.

COURSE TITLE: EMBEDDED SYSTEMS

COURSE CODE: PEI 404A/T/EI

COURSE OUTCOMES On succcessful completion of course student will:

1. Analyze the models of embedded systems using different processor technologies and also various types of peripherals used in embedded system.
2. Analyze a given embedded system design and identify its performance
3. Understand the programming model and Instruction set of 8051 Microcontroller, Addressing mode supported by 8051 instruction set.
4. Practice the assembly language programs.
5. Gain knowledge on Serial data transfer, Interrupts, I/o ports and port expansion, DAC, ADC, Stepper motor,
6. Interpret the interfacing of LCD, key board, A/D & D/A, and stepper motor 8051 Microcontroller.