

M.Sc. (Physics) (Semester-III and IV)

(Syllabus w.e.f. 2019-20)

Paper title: Nuclear and Particle Physics

Course Outcomes:

CO-1) Acquire basic knowledge about Nucleon-Nucleon interaction, deuteron problem, n-p, p-p and N-N scattering, nuclear forces etc.

CO-2) Understand the Elementary ideas of alpha, beta and gamma decays, nuclear fission and fusion reactions mechanism.

CO-3) Develop the understanding of cosmic rays and elementary particles and their properties.

CO-4) Learn about the concept of particle physics classification like charge, spin, parity, isospin, strangeness etc.

Paper title: Thin film deposition and other techniques

Course Outcomes:

CO-1) Gain basic knowledge of deposition techniques like Chemical Vapor, Spray and other like, electro spray, electroplating, Spin coating, SILAR.

CO-2) clarify the concepts of Solid solutions like substitutional, disordered, ordered, interstitial hardening, Age hardening, dispersion hardening, phase transformation hardening principles of hot and cold working of metals and their effects on mechanical properties.

CO-3) impart knowledge of Raman Scattering rotational and vibrational spectra, Raman Electron Spin Resonance (ESR Hyperfine structure, ESR of Transition metals

CO-4) develop the understanding of Heat treatment furnaces like Oil and Gas fired furnaces, Electric furnaces, Batch furnace and their types, Semi continuous and continuous furnace, Air convection furnace, salt bath furnace


Paper title: Solid State Physics- I

(Thin film deposition techniques- Magnetic and Electric properties)

Course Outcomes:

CO-1) Provide a critical and systematic understanding on advanced Physical methods of




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deposition like Chemical bath deposition, electro deposition, Spray pyrolysis, (SILAR), Sol-gel, hydrothermal deposition techniques etc.

CO-3) Learn the basics of the Magnetic behavior of various materials and their types

CO-4) Understanding of electrical properties in solids, Wiedermann-Franz law, Hall Effect, magneto resistance, thermionic emission.

Paper title: SOLID STATE PHYSICS- II (Semiconductor Physics)

Course Outcomes:

CO-1) get critical and systematic understanding of energy bands and charge carriers in Semiconductors.

CO-2) Learn the basics of excess carriers in semiconductors, Optical absorption, Luminescence, diffusion and drift of carriers.

CO-3) Provide a broad view of fabrication of p-n junctions and current flow through at a junction, Capacitance of p-n junctions, heterojunction.

CO-4) Provide a broad view of current flow mechanism across p-n junction.

Paper title: EXPERIMENTAL TECHNIQUES

Course Outcomes:

CO-1) Provide a critical and systematic understanding on vacuum techniques like rotary, diffusion, and sputter ion pumps

CO-2) Provide a critical and systematic understanding on measurement of low pressure and simple methods of LD, palladium barrier and halogen leak detectors.

CO-3) Learn the basics of the Atomic Absorption Spectrometry and Low Temperature and Microscopy Techniques like Optical microscopy, scanning electron microscopy, electron microprobe analysis, low energy electron diffraction.

CO-4) Impart the knowledge about X-Ray Fluorescence Spectrometry and Mössbauer Spectroscopy.

Paper title: Electronic Devices and applications


Course Outcomes:

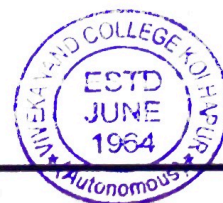
CO-1) Understand the working, structure and operation and functions of (BJT), (JFET), MOSFET, MESFET, and diodes.

CO-2) Identify the problems and applications of Magneto-optic and acousto-optic, Piezoelectric, Electrostrictive and magnetostrictive effects.

CO-3) Acquire basic knowledge about Light emitting Diodes, OLED, Infrared LED, Photodetector, Photoconductor, Photodiode, p-n junction Solar cells, Semiconductor Lasers.

CO-4) Learn the techniques of Thermistor, and sensors.


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Photodetector, Photoconductor, Photodiode, p-n junction Solar cells, Semiconductor Lasers.

CO-4) Learn the techniques of Thermistor, and sensors.

Paper title: SOLID STATE PHYSICS- III (Physical properties of solid)

Course Outcomes:

CO-1) Understand the matter interaction Electronic Structure of Crystals

CO-2] Identify the problems and applications of Transport Properties of Metals.

CO-3] Acquire basic knowledge about Phonons, Plasmons, Polaritons, and Polarons

CO-4] Impart the knowledge about the Defects in crystals.

Paper title: SOLID STATE PHYSICS-IV (Energy Conversion and Storage Devices)

Course Outcomes:


CO-1) Understand the concept and applications of Solar Photovoltaics

CO-2) Identify the problems and applications of Dye and Quantum Dot Sensitized Solar Cell.

CO-3) Acquire basic knowledge of Perovskite and Organic Solar cell.

CO-4) Impart the knowledge and provide a broad view about the Supercapacitors and Batteries.




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