

I Year - II Semester	ENGINEERING PHYSICS	L	T	P	C
		4	0	0	3

(ME, CE, PE, PCE, MET.E, MINING, AUTOMOBILE, CHEMICAL, AERONAUTICAL, BIO.TECH)

OBJECTIVES: *Physics curriculum which is re-oriented to the needs of Circuital branches of graduate engineering courses offered by JNTUniv.Kkd. that serves as a transit to understand the branch specific advanced topics. The courses are designed to:*

- *Impart concepts of Optical Interference, Diffraction and Polarization required to design instruments with higher resolution - Concepts of coherent sources, its realization and utility optical instrumentation.*
- *Study the Structure-property relationship exhibited by solid crystal materials for their utility.*
- *Tap the Simple harmonic motion and its adaptability for improved acoustic quality of concert halls.*
- *To explore the Nuclear Power as a reliable source required to run industries*
- *To impart the knowledge of materials with characteristic utility in appliances.*

UNIT-I

INTERFERENCE: Principle of Superposition – Coherent Sources – Interference in thin films (reflection geometry) – Newton’s rings – construction and basic principle of Interferometers.

UNIT-II

DIFFRACTION: Fraunhofer diffraction at single slit cases of double slit, N-slits & Circular Aperture (Qualitative treatment only)-Grating equation - Resolving power of a grating, Telescope and Microscopes.

UNIT-III

POLARIZATION: Types of Polarization-production - Nicol Prism -Quarter wave plate and Half Wave plate – Working principle of Polarimeter (Sacharimeter)

LASERS: Characteristics– Stimulated emission – Einstein’s Transition Probabilities-Pumping schemes - Ruby laser – Helium Neon laser.

UNIT-IV

ACOUSTICS: Reverberation time - Sabine’s formula – Acoustics of concert-hall.

ULTRASONICS: Production - Ultrasonic transducers- Non-Destructive Testing – Applications.

UNIT-V

CRYSTALLOGRAPHY & X-RAY DIFFRACTION: Basis and lattice – Bravais systems-Symmetry elements- Unit cell- packing fraction – coordination number- Miller indices – Separation between successive (h k l) planes – Bragg’s law.

NUCLEAR ENERGY – SOURCE OF POWER: Mass defect & Binding Energy – Fusion and Fission as sources – Fast breeder Reactors.

UNIT-VI

MAGNETISM: Classification based on Field, Temperature and order/disorder –atomic origin – Ferromagnetism- Hysteresis- applications of magnetic materials (Para &Ferro)..

DIELECTRICS: Electric Polarization – Dielectrics in DC and AC fields – Internal field – Clausius Mossoti Equation - Loss, Breakdown and strength of dielectric materials – Ferroelectric Hysteresis and applications.

Outcome: Construction and working details of instruments, ie., Interferometer, Diffractometer and Polarimeter are learnt. Study Acoustics, crystallography magnetic and dielectric materials enhances the utility aspects of materials.

Text Books:

1. A Text book of Engineering Physics – by Dr. M.N.Avadhanulu and Dr.P.G.Kshirasagar, S.Chand & Company Ltd., (2014)
2. Physics for Engineers by M.R.Srinasan, New Age international publishers (2009)
3. Engineering Physics by D.K.Bhattacharya and Poonam Tandon , Oxford press (2015)

Reference books:

1. Applied Physics by P.K.Palanisamy , Scitech publications (2014)
2. Lasers and Non-Linear optics by B.B.Laud , Newage international publishers (2008)