

**I Year II Semester
17PH201**

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ENGINEERING PHYSICS

OBJECTIVES:

Physics curriculum which is reoriented to the needs of circuital branches of graduate engineering courses is designed to:

1. Impart knowledge of physical optics phenomenon like interference, diffraction and polarization involving required to design instruments with higher resolution.
2. Teach concepts of coherent sources, its realization and utility optical instrumentation.
3. Tap the simple harmonic motion and its adaptability for improved acoustic quality of concert hall.
4. To impart the knowledge of materials with characteristic utility in appliances.

UNIT-I

INTERFERENCE: Introduction- Principle of superposition- Coherent sources- Interference in thin films by reflection- Newton rings – Principle and working of Michelson Interferometers.

UNIT-II

DIFFRACTION: Introduction- Fraunhofer diffraction at single slit- Diffraction at Circular aperture- Grating equation- Resolving power of Grating, Telescope and microscopes.

POLARIZATION: Introduction- Methods for production of polarized light- Nicol's prism- Quarter wave plate- Half wave plate-Polarimeter.

UNIT-III

LASERS: Introduction- Characteristics of LASER- Basic principle of LASERs- Einstein theory of LASERs- Population inversion- He-Ne Lasers

FIBER OPTICS: Introduction- Construction and working principle of optical fibre- Acceptance angle- Numerical aperture.

UNIT-IV

ACOUSTICS: Introduction- Reverberation, Reverberation time- Sabine's formula- Acoustics of concert hall.

ULTRASONICS: Introduction- Production of Ultrasonics by Magnetostriction and piezoelectric method- Applications of Ultrasonics.

UNIT-V

CRYSTALLOGRAPHY: Introduction- Basis and lattices- Crystal systems- Bravais lattices- Crystal structures of simple cubic crystal (SCC), Body centered cubic crystal (BCC) and Face centered cubic crystal (FCC).

X-RAY DIFFRACTION: Crystal planes- Miller Indices- Separation between successive (hkl) planes- Bragg's law.

UNIT-VI

MAGNETIC MATERIALS: Basic definition-Origin of magnetic momentum- Classification of magnetic materials- Hysteresis loop- Soft & Hard magnetic materials.

NUCLEAR PHYSICS: Introduction- Stability of Nuclei, Mass defect- Nuclear Fission, Nuclear Fusion, Nuclear reactor.

OUTCOME: Construction and working principles of LASER and Optical fiber are learnt. Study of acoustics crystallography, magnetic and superconducting materials enhances the utility aspects of the materials

Text Books

1. A text book of engineering physics by Dr. M. N. Avadhanulu and Dr. P.G. KshiraSagar, S. Chand and company Ltd.
2. Solid state physics by A.J. Dekker, McMillan Publishers Engineering Physics by D.K. Battacharya and PoonamTandon, Oxford press.

Reference Books

1. Applied Physics by P.K. Palanisamy, Scitech Publishers.
2. Engineering Physics by Armugham, Anuradha Publication.