I/IV B. Tech – First Semester

**CE/ChE/CS/IT/EC/EE/ME -112**

**Engineering Physics - I**

Lectures : **3 Periods/Week** Internal Assessment : **40Marks**

Tutorials : **1 Period/Week** Semester End Examination : **60Marks**

Semester Exam: **3hrs** Credits : **3**

**Unit –I (10periods)**

**Ultrasonics:** production of ultrasonics by magnetostriction, piezo electric oscillator methods, detection by acoustic grating method, ultrasonic pulse echo testing method, General applications of ultrasonics in engineering and medicine.

**Interference:** superposition principle, young’s double slit experiment (qualitative treatment),stoke’s principle (change of phase on reflection), interference in thin films due to reflected light (Cosine law), theory of air wedge (fringes produced by a wedge shaped thin film) and theory of newton’s rings(reflected system), non-reflecting films.

# Unit-II (11 Periods)

**Diffraction:** Fraunhofer diffraction due to a single slit(quantitative), theory of plane transmission diffraction grating, Rayleigh’s criterion, resolving power & dispersive powers of a grating.

**Polarization:** introduction, double refraction, construction and working of a nicol prism, nicol prism as a polarizer and analyser, quarter wave plate, production and detection of circular and elliptical polarizations(qualitative), optical activity, specific rotation, Kerr and Faraday effects.

**Unit-III** **(11 Periods)**

**Lasers**: Laser characteristics, spontaneous and stimulated emissions, population inversion, pumping, active system, gas (He-Ne) laser, Nd: YAG laser and semiconductor (GaAs) laser, applications of lasers.

**Holography**: basic principle, recording, reproduction and applications.

**Fiber optics:** structure of optical fiber, light propagation through optical fiber-numerical aperture, acceptance angle and acceptance cone, types of optical fibers, fiber optics in communication system and applications of optical fibres.

# Unit-IV (10 Periods)

# Electromagnetism: induced electric fields, displacement current and conduction current, Maxwell’s equation – qualitative (differential & integral forms)-significance, LC oscillations (quantitative), velocity of electromagnetic wave equation in free space , poynting vector.

**Statistical Physics :** phase space, Differences between MB-FD-BE statistics (qualitative), Brief explanation of photon gas & electron gas.

**Text Books**

1. Engineering Physics – R .K. Gaur & S. L. Gupta Danpati Rai Publications, Delhi.
2. Engineering Physics – Hitendra K. Malik & A.K.Singh, Tata MacGraw Hill, New Delhi

**Reference Books**

1. Fundamentals of Physics – Resnick & Halliday, John Wiley sons.
2. Engineering Physics – M.N. Avadhanulu & P.G. Kshirasagar, S.Chand & Co.Ltd.
3. Engineering Physics – M.Arumugam, Anuradha Publications, Chennai.
4. Engineering Physics – B. K. Pandey & S. Chaturvedi, Cengage Learning India Pvt. Ltd., Delhi.

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