BPHS0003: MODERN ENGINEERING PHYSICS
W.E.F. ACADEMIC YEAR 2020-21

OBJECTIVE: The Syllabus is designed and styled especially to give B.Tech I year students a sound base in fundamental physics as well as to give their exposure to a wide range of its utility in engineering and technology.

L–T–P: 3–1-2

Credits: 04 **Semester I &II**

Module No.	Content	Teaching Hours (Approx.)
I	**1. Wave Optics:** Principle of superposition, Coherent Sources, Interference in uniform and wedge shaped thin film, Fresnel's biprism and Newton's Ring experiments, Diffraction: Fresnel and Fraunhofer diffraction, diffraction due to Single-slit, Qualitative description of N slits diffraction, Phenomenon of double refraction, Superposition of ordinary and extra ordinary rays, Optical activity, Specific rotation. **2. Solid State Physics:** Classification of solids, Temperature dependence & temperature independence of conductivity of intrinsic semiconductors, Hall effect, Superconductivity, Meissner Effect, Type I and Type II superconductors.	**23**
II	**1. Electromagnetic Theory:** Displacement current, Continuity equation, Maxwell's equations, Propagation of E M waves in vacuum and in conducting medium, Skin depth, Poynting vector and Poynting theorem, Plane electromagnetic wave in vacuum and their transverse nature. **2. Introduction to Quantum Mechanics:** Wave - particle duality, de-Broglie hypothesis, wave packet, Heisenberg's uncertainty principle and its applications;(Non-existence of electrons in nucleus and Bohr's first orbit radius), Wave function and its normalization, Schrödinger's wave equation: time dependent and time independent, Particle in one dimensional, Compton Effects.	**25**

Text Books:

*Engineering Physics by S.K. Gupta/ S.L. Gupta Vol. I & II

***Engineering Physics by B.K. Singh and R.K. Dubey**

Reference Books:

*Concept of Modern Physics - by Beiser (Tata Mc-Graw Hill)

*Materials Science and Engineering - by V. Raghavan (Prentice- Hall India)

* Quantum Mechanics By Satya Prakash.

OUTCOME:

After completing the course, the B.Tech. I year students would be able to apply the subject knowledge in engineering science and technology.

- Teaching-learning methodology of the course is such that the elementary knowledge of a student raises gradually to its complex aspects during the completion of the course program.
- A student of average caliber can comprehend the theoretical aspects easily without strain.