VIKRAMA SIMHAPURI UNIVERSITY::NELLORE
I YEAR OF FOUR YEAR B.TECH DEGREE COURSE
(COMMON TO ALL BRANCHES)

(With effect from the Academic Year 2010-2011)

10PY101- Engineering Physics

Hours /week	: 4 Hrs	Sessional Marks	: 40
Credits	: 4	End Examination Marks	: 60

UNIT – I

Wave Mechanics : Wave- particle duality, De Broglie concepts of Matter waves, Properties of Matter waves. Davisson and Germer's experiment , G P Thomson experiment, Heisenberg's uncertainty principle, Schorodinger's time independent and dependent wave equation, Kronig – penny model, Acceleration of electron moving in periodic lattice and effective mass of electrons, Distinction between metals, insulators and semi conductors.

UNIT – II

Crystallography: Unit cell , Bravais lattice , crystal packing, closed packed structures- HCP, Diamong Zns and Nacl structures, Miller indices, Bragg's law- Bragg's spectrometer and Crystal structure determination, defects in crystal structure- point, line and plane defects.

UNIT – III

Thermodynamics: Heat and work – first law of thermodynamics and its application, reversible and irreversible processes, carnot's cycle and efficiency, second law of thermodynamics, carnot's theorem.

Diffusion: Fick's law of diffusion, atomic model of diffusion, Kirkendall effect .

UNIT-1V

Lasers: Introduction, spontaneous and stimulated emissions, population inversion, pumping, types of lasers: He-ne laser, Ruby laser and semiconductor laser, applications of lasers.

Ultrasonics: Introduction, production of ultrasonics by magnetostriction and piezo electric effect, detection and applications of ultrasonics.

UNIT-V

Semiconductors: Direct and Indirect semiconductors, intrinsic and extrinsic semiconductors, electron and hole densities, equilibrium and non equilibrium conditions in semiconductors, continuity equations, carrier scattering and mobility, drift current and conductivity – Hall effect.

Text Books:

1. Engineering Physics : P K Palaniswamy
2. Engineering physics: RK Garu & G L Gupta
3. Solid State Physics : Puri R K & Babbar VK

Reference Books:

1. Solid State Physics: Singhal SL
2. Applied Physics: Ramachandra B & Subramanyam SV