

**Prasad V. Potluri Siddhartha Institute of Technology, Kanuru, Vijayawada**  
**Department of Freshman Engineering**  
**I B.Tech Syllabus**  
**Engineering Physics**

<b>Course Category</b>	Basic Sciences	<b>Course Type</b>	Theory	<b>Regulation</b>	PVP20
<b>Credits</b>	3	<b>L-T-P</b>	3-0-0	<b>Pre-requisites</b>	Nil
<b>Continuous Internal Evaluation:</b>	30	<b>Semester End Evaluation:</b>	70	<b>Total Marks:</b>	100

Unit No.	CONTENTS
I	<b>Fiber Optics:</b> Introduction, advantages of optical fibers, principle and structure, acceptance angle, numerical aperture, modes of propagation, classification of fibers, fiber optic communication, fiber optic sensors (Temperature, displacement and force), applications.
II	<b>Dielectric and Magnetic materials</b> <b>Dielectric materials:</b> Introduction, electric polarization, dielectric polarizability, susceptibility and dielectric constant, types of polarizations (qualitative treatment only), frequency dependence of polarization, Lorentz (internal) field (quantitative), Clausius-Mossotti equation. <b>Magnetic materials:</b> Introduction, magnetic dipole moment, magnetization, magnetic susceptibility and permeability, origin of permanent magnetic moment, classification of magnetic materials, domain theory, hysteresis, soft and hard magnetic materials.
III	<b>Electromagnetics:</b> <b>Electrostatic field:</b> Electric potential, Coulombs law and Gauss law, derivation of Coulombs law from Gauss law, applications of Gauss law (line charge, thin sheet of charge and solid charged sphere), Gauss law of Electrostatics in dielectric medium, Poisson's and Laplace equations. <b>Magnetostatic field:</b> Bio-Savart law, Faraday's and Ampere's laws in integral and differential form, displacement current, continuity equation and Maxwell's equations (qualitatively).
IV	<b>Semiconductor Physics</b> Introduction, origin of energy band, intrinsic and extrinsic semiconductors, generation and recombination, carrier concentration in intrinsic semiconductors, variation of Fermi level with temperature in intrinsic semiconductor, n-type and p-type semiconductors, carrier concentration in n type and p type semiconductors, variation of Fermi level with temperature in extrinsic semiconductors.
V	<b>Semiconductor Devices</b> Drift and diffusion currents in semiconductors, Hall effect and its applications, p-n junction diode formation and V-I characteristics, direct and indirect band gap semiconductors, construction and working of photodiode, LED, solar cell

## Learning Resources

### Text Books

1. Engineering Physics, R.K.Gaur & S.L.Gupta, Dhanpatrai Publications.
2. Solid State Physics, S.O.Pillai, New Age International.

### Reference Books

1. A Text Book Of Engineering Physics, M.N.Avadhanulu & P.G.Kshrisagar, S.Chand Publications
2. Semiconductor Devices & Physics, S.M.Sze, Wiley, 2008.
3. Applied Physics, P.K. Palanai Swamy, Scitech Publications.
4. Engineering Physics, Dr.M.Arumugam, Anuradha Publications.
5. Introduction To Electrodynamics, David.J.Griffths, Pearson Education.

### e- Resources & other digital material

<http://physicsforidiots.com/physics/electromagnetism/>  
<https://www.arcelect.com/fibercable.htm>  
<http://freevideolectures.com/Course/3048/Physics-of-Materials/36>  
<https://www.iitk.ac.in/mse/electronic-materials-and-devices>  
[https://link.springer.com/chapter/10.1007/978-3-319-48933-9\\_35](https://link.springer.com/chapter/10.1007/978-3-319-48933-9_35)