<19BS1104 > - <ENGINEERING PHYSICS>

Course Category:	BASIC SCIENCES	**Credits:**	3
Branch	IT		
Course Type:	Theory	**Lecture-Tutorial-Practical:**	3
Prerequisites:	- NIL -	**Continuous Evaluation:**	30
		Semester End Evaluation:	70
		Total Marks:	100

Upon successful completion of the course, the student will be able to:

Course Outcomes

CO1	Apply the fundamental laws of electricity and magnetism to currents and propagation of EM waves.
CO2	Identify the propagation of light and demonstrate the loss mechanisms in optical fibers.
CO3	Explain the principles of physics in dielectrics, magnetic materials and identify the mechanisms of polarization for useful engineering applications.
CO4	Classify solids and calculate carrier concentration and conductivity in semiconductors.
CO5	Demonstrate the functioning of solar cell, photodiode, and semiconductors devices for engineering applications.

Contribution of Course Outcomes towards achievement of Program Outcomes&Strengths of correlations

	PO1	PO2	PO3	P04	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	H	H												
CO2	H	H												
CO3	H	H											L	
CO4	H	H												
CO5	H	H											L	

L- Low **M-Medium** **H-High**

Course Content

UNIT-1	**Basics of Electromagnetics** (9 L) Electrostatic field: 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, divergence and curl of electric fields, electric potential, relation between potential and force, Poisson's and Laplace equations. Magnetostaticfield:Biot–Savart law, divergence and curl of magnetic fields, Faraday's and Ampere's laws in integral and differential form, displacement current, continuity equation, Maxwell's equations	CO1
UNIT-2	**Fiber Optics** Introduction, advantages of optical fibers, principle and structure, acceptance angle, numerical aperture, modes of propagation, classification of fibers, fiber optic communication, importance of V- number, fiber optic sensors (Temperature, displacement and force), applications.	CO2
UNIT-3	**Dielectric and Magnetic materials** Dielectric materials: Introduction, electric polarization, dielectric polarizability, susceptibility and dielectric constant, types of polarizations (qualitative treatment only),	CO3

	frequency dependence of polarization, Lorentz (internal) field (quantitative), Clausius-Mossotti equation. Magnetic materials: Introduction, magnetic dipole moment, magnetization, magnetic susceptibility and permeability, origin of permanent magnetic moment, classification of magnetic materials, Weiss theory of ferromagnetism (qualitative), domain theory, hysteresis, soft and hard magnetic materials.	
UNIT-4	**Semiconductor physics** Introduction, origin of energy band, intrinsic and extrinsic semiconductors, mechanism of conduction in intrinsic semiconductors, generation and recombination, carrier concentration in intrinsic semiconductors, variation of intrinsic carrier concentration with temperature, n-type and p-type semiconductors, carrier concentration in ntype and ptype semiconductors.	CO4
UNIT-5	**Semiconductor devices** Drift and diffusion currents in semiconductors, Hall effect and its applications, magnetoresistance, p-n junctionlayerformation and V-I characteristics, direct and indirect band gap semiconductors, construction and working of photodiode, LED, solar cell	CO5
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 MODULE ,PVPSIT	

<19BS1153 > - <ENGINEERING PHYSICS LAB>

Course Category:	BASIC SCIENCES	**Credits:**	1.5
Branch	IT		
Course Type:	Lab	**Practical:**	3
Prerequisites:	- NIL -	**Continuous Evaluation:**	25
		Semester End Evaluation:	50
		Total Marks:	75

Upon successful completion of the course, the student will be able to:

Course Outcomes	
CO1	Assess the intensity of the magnetic field of circular coil carrying current with varying distance and utilize four probe set up to measure resistance.
CO2	Evaluate the acceptance angle of an optical fiber and numerical aperture and loss.
CO3	Demonstrate the importance of dielectric materialand measure magneticparameters.
CO4	Identify the type of semiconductor using hall effect and determine the band gap of a semiconductor.
CO5	understandthe characteristics of photodiode, p-n junction diode and solar cell.Type equation here.

Contribution of Course Outcomes towards achievement of Program Outcomes&Strengths of correlations

	PO1	PO2	PO3	P04	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	H		H											
CO2	H		H											
CO3	H		H											
CO4	H		H											
CO5	H		H											

L- Low **M-Medium** **H-High**

Course Content

EXP-1 &EXP-2	1. TO DETERMINE THE MAGNETIC FIELD ALONG THE AXIS OF A CIRCULAR COIL CARRYING CURRENT. 2.TO DETERMINE THE MAGNETIC SUSCEPTIBILITY BY GOUY'S METHOD	CO1
EXP.3	3. TO DETERMINE THE NUMERICAL APERTURE OF A GIVEN OPTICAL FIBRE AND HENCE TO FIND ITS ACCEPTANCE ANGLE.	CO2
EXP.4	4.TO DETERMINE THE DIELECTRIC CONSTANT OF A SUBSTANCE BY RESONANCE METHOD	CO3
EXP.5,EXP.6 & EXP.7	5. TO DETERMINE THE RESISTIVITY OF SEMICONDUCTOR BY FOUR PROBE METHOD 6. TO DETERMINE THE HALL COEFFICIENT USING HALL EFFECT EXPERIMENT. 7. TO DETERMINE THE ENERGY GAP OF A SEMICONDUCTOR	CO4
EXP.8, EXP.9 & EXP.10	8. TO STUDY THE CHARACTERISTICS OF PHOTO DIODE 9. TO STUDY THE CHARACTERISTICS OF PN DIODE 10. TO STUDY THE CHARACTERISTICS OF SOLAR CELL.	CO5

Learning Resources

Text Books	1)RamaraoSri,ChoudaryNityanand and Prasad Daruka, "Lab Manual of Engineering Physics"., Vth ed., Excell Books, 2010
Reference Books	SEMICONDUCTOR DEVICES & PHYSICS,S.M.SZE,WILEY,2008.
e- Resources & other digital material	https://www.niser.ac.in/sps/teaching-laboratories