



**SWARNANDHRA
COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)**

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC
With "A" Grade – 3.32/4.00 CGPA, Recognized Under 2(f) & 12(B) of UGC Act 1956
Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK., Kakinada
Seetharampuram, W.G.DT., Narsapur – 534280, (Andhra Pradesh)

DEPARTMENT OF BASIC SCIENCES AND HUMANITIES

TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
20BS1T01	ENGINEERING PHYSICS	I	MECH EEE, ECE & ROBOTICS	6	2021-22	29.11.2021

COURSE OUTCOMES

At the end of the course, student will be able to

1	Describe Basic crystal systems and determination of crystal structures [K2]
2	Explain Magnetic and Dielectric Materials properties [K2]
3	Describe Concept of Magnetic Induction and Super Conducting properties [K2]
4	Explain Pure & doped Semiconductor devices for better utility [K2]
5	Describe Optical fibers and Optical properties of materials and their applications[K2]

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
I 1. CRYSTAL STRUCTURE & 2. X-RAY DIFFRACTION	1 / K2	1.1	Introduction, Space lattice, basis	T1	1	Chalk & Talk, PPT
	1 / K2	1.2	Unit cell, and lattice parameters	T1, R1,	1	Chalk & Talk, PPT
	1 / K2	1.3	Crystal Systems	T1, R3,W2	1	PPT, Video presentation
	1 / K2	1.4	Bravais lattices- types of crystals	T1, R3, W4	1	PPT, Video presentation
	1 / K2	1.5	Structures and packing fraction of Simple Cubic	T1, R1	1	Chalk & Talk, PPT
	1 / K2	1.6	Structures and packing fraction of Body Centered Cubic	T1, R1, W3	1	PPT, Video presentation
	1 / K2	1.7	Structures and packing fraction Face Centered Cubic	T1, R2	1	Chalk & Talk, PPT
	1 / K2	2.1	Directions and Planes in crystal	T1, R1	1	Chalk & Talk, PPT
	1 / K2	2.2	Miller Indices and procedure to find Miller Indices	T1, R1	1	PPT, Video presentation
	1 / K2	2.3	Separation between(h , k , l) Planes	T1, R1, W3	1	PPT, Video presentation



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	1 / K2	2.4	Bragg's law- Bragg's Spectrometer	T1, R1	1	PPT, Video presentation
Content beyond Syllabus	1 / K2	2.5	Powder method	T1, R1, W4	1	PPT, Video presentation
Total					12	
II 3.MAGNETIC PROPERTIES & 4.DIELECTRIC PROPERTIES	2 / K2	3.1	Introduction, Basic definitions	T1, R2, W1	1	PPT, Video presentation
	2 / K2	3.2	Origin of magnetic moment	T1, R3	1	Chalk & Talk, PPT
	2 / K2	3.3	Classification of Magnetic materials : Dia, Para and Ferro Magnetism Anti-Ferro and Ferrimagnetism	T1, R1	1	Chalk & Talk, PPT
	2 / K2	3.4	Classification of Magnetic materials: Anti-Ferro and Ferrimagnetism	T1, R1	1	Chalk & Talk, PPT
	2 / K2	3.5	Hysteresis Loop of ferromagnetic material	T1, R1, W5	1	PPT, Video presentation
	2 / K2	3.6	Soft and Hard Magnetic materials Problems	T1, R1, W5	1	PPT, Video presentation
	2 / K2	4.1	Introduction, Dielectric constant	T1, R1	1	Chalk & Talk, PPT
	2 / K2	4.2	Electronic Polarizations	T1, R1	1	Chalk & Talk, PPT
	2 / K2	4.3	Ionic and Orientational (Qualitative) Polarizations	T1, R2, W4	1	PPT, Video presentation
	2 / K2	4.4	Internal fields in Solids,	T1, R3	1	Chalk & Talk, PPT
	2 / K2	4.5	Clausius-Mosotti equation Problems	T1, R1	1	Chalk & Talk, PPT
Content beyond Syllabus	2 / K2	4.6	Weiss Domain theory of ferromagnetism	T1, R1, W10	1	PPT, Video presentation
Total					12	
III 5.ELECTROMAGNETIC WAVES	3 / K2	5.1	Introduction, Electric & Magnetic Flux	T1, R1, W1	1	PPT, Video presentation
	3 / K2	5.2	Gauss's Law in Electrostatics & Magneto statics	T1, R2	1	Chalk & Talk, PPT
	3 / K2	5.3	Ampere's Law- B for a Solenoid	T1, R2	1	Chalk & Talk, PPT
	3 / K2	5.4	Biot-Savart's Law- Magnetic Induction due to current carrying circular loop	T1, R2, W3	1	PPT, Video presentation
	3 / K2	5.5	Faraday's Law of induction	T1, R1	1	Chalk & Talk, PPT
	3 / K2	5.6	Maxwell's Equations- Differential forms and Integral forms	T1, R1	1	Chalk & Talk, PPT
Total					6	
MID I EXAMINATION DURING SEVENTH WEEK						



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III 6.SUPER CONDUCTIVITY	3 / K2	6.1	Introduction-, T_c , H_c , I_c	T1, T2	1	Chalk & Talk, PPT
	3 / K2		General properties			
	3 / K2	6.2	Meissner Effect- Type I and Type II Superconductors	T1, R1	1	Chalk & Talk, PPT
	3 / K2	6.3	Flux quantization ,BCS Theory of Superconductivity	T1,T2	1	Chalk & Talk, PPT
	3 / K2	6.4	Josephson effects	T1, R3, W4	1	PPT, Video presentation
	3 / K2	6.5	Applications of Superconductivity	T1,R2	1	Chalk & Talk, PPT
Content beyond Syllabus	3 / K2	6.6	Penetration Depth	T1, R1, W4	1	PPT, Video presentation
Total					6	
IV SEMICONDUCTOR PHYSICS	4 / K2	7.1	Introduction	T1, R1	1	Chalk & Talk, PPT
	4 / K2	7.2	Intrinsic Semiconductor Carries concentration of electrons	T1, R3	1	Chalk & Talk, PPT
	4 / K2	7.3	Carries concentration of holes	T1, R3	1	Chalk & Talk, PPT
	4 / K2	7.4	Equation for conductivity	T1, R1	1	Chalk & Talk, PPT
	4 / K2	7.5	Extrinsic semiconductor n-type Carries concentration	T1, R2, W4	1	PPT, Video presentation
	4 / K2	7.6	p-type Carries concentration	T1, R2	1	Chalk & Talk, PPT
	4 / K2	7.7	Drift and Diffusion coefficients- Einstein's equation	T1, R1, W4	1	PPT, Video presentation
	4 / K2	7.8	Hall effect and its applications	T1, R1, W5	1	PPT, Video presentation
	4 / K2	7.9	Problems	T1, R3,	1	PPT, Video presentation
Content beyond Syllabus	4 / K2	7.10	p-n diode , zener diode	T2, R2, W1	1	PPT, Video presentation
Total					10	
V 8. LASERS & 9.OPTICAL FIBERS	5 / K2	8.1	Introduction, characteristics of lasers,	T1,T2	1	Chalk & Talk, PPT
	5 / K2	8.2	Stimulated absorption, Spontaneous emission, and Stimulated emission	T1, R1	1	Chalk & Talk, PPT
	5 / K2	8.3	Einstein Coefficients and their relation	T1, R2, W4	1	PPT, Video presentation
	5 / K2	8.4	Population Inversion and Different types of Pumping schemes	T1, R2	1	Chalk & Talk, PPT
	5 / K2	8.5	Important components of Laser, Three and Four level pumping schemes	T1,R3, W4	1	PPT, Video presentation
	5 / K2	8.6	Ruby Laser	T1,R2, W2	1	PPT, Video presentation
	5 / K2	8.7	He-Ne Laser, Applications of Lasers	T1,R2,	1	PPT, Video presentation



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				W5		
	5 / K2	9.1	Introduction to Optical fibers	T1,R2	1	Chalk & Talk, PPT
	5 / K2	9.2	Critical angle of propagation Total internal reflection	T1,R3	1	Chalk & Talk, PPT
	5 / K2	9.3	Acceptance angle, acceptance cone and Numerical aperture	T1,R3	1	Chalk & Talk, PPT
	5 / K2	9.4	Classification of optical fibers based on refractive index profile	T1, R1, W4	1	PPT, Video presentation
	5 / K2	9.5	Classification of optical fibers based on modes	T1, R2	1	Chalk & Talk, PPT
	5 / K2	9.6	Attenuation in optical fibers and Applications of optical fibers	T1, R3, W4	1	PPT, Video presentation
Content beyond Syllabus	5 / K2	9.7	Semiconductor Laser	T1, R3, W5	1	PPT, Video presentation
Total					14	
CUMULATIVE PROPOSED PERIODS					60	
MID II EXAMINATION DURING FOURTEENTH WEEK						
END EXAMINATIONS						
Text Books:						
S. No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION					
1.	M. N. Avadhanulu, P. G. Kshirasagar & TVS Arun Murthy, A Text Book of Engineering Physics, 11th Edition, S. Chand publications, 2019.					
Reference Books:						
S. No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION					
1.	Charles Kittel; Introduction to solid state physics, 8 th Edition, John Wiley & Sons, Inc,					
2.	S.O. Pillai; Solid state physics, New Age International, 2010					
3.	Shatendra Sharma and Jyotsna Sharma; Engineering Physics, Pearson Education, 2018					
4.	P. K. Palanisamy; Engineering Physics, SciTech Publishers, 2018					
5.	D. Thirupathi Naidu and M. Veeranjanyulu; Engineering Physics, VGS Publishers, 2013					
Web Source References:						
1.	www.nptel.edu.in					
2.	www.ocw.mit.edu					
3.	www.vlab.co.in					
4.	NPTEL videos					
5.	Booksc.org					



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	Name	Signature with Date
i. Faculty I (for common Course)	Dr. N.G. Praveena	
ii. Faculty II (for common Course)	Mr. K. Koteswara rao	
iii. Faculty III (for common Course)	Mr. A. Satish	
iv. Course Coordinator	Dr. V. Swaminadham	
v. Module Coordinator	Not Applicable	
vi. Programme Coordinator	Dr. V. Swaminadham	

Principal



DEPARTMENT OF BASIC SCIENCES AND HUMANITIES

LAB LESSON PLAN

Course Code	Course Name	Regulation	Academic year	Year / Semester	Branches	Contact Periods/Week	Sections
20BS1L01	Engineering Physics Lab	R-20	2021- 2022	I B.Tech / I Sem	Common to EEE, ECE, MECH & ROBOTICS	3	

COURSE OUTCOMES

At the end of the course, student will be able to

CO1: Demonstrate the basic knowledge to know the frequency of a vibrator, hall coefficient. (K3)

CO2: Attain knowledge to verify some of the properties of physical optics. (K4)

CO3: Develop skills to plot various characteristic curves and to calculate the physical Properties of given materials. (K4)

CO4: Calculate some of the properties of semiconducting materials. (K2)

WEEK	COURSE OUTCOMES	EXPT NO	DESCRIPTION	NO. OF SESSIONS
1,2	CO1: Demonstrate basic knowledge to know the frequency of a vibrator, hall coefficient	1	Determine frequency of A.C. supply by using Sonometer	1
		2	Determine Frequency of given electrically driven tuning fork in Transverse and Longitudinal modes by using Melde's apparatus	1
3,4,5	CO2: Attain knowledge to verify some of the properties of physical optics	3	Determine Planck's constant by using photo cell	1
		4	Determine the wavelength of Laser using diffraction grating	1

		5	Determination of Numerical Aperture and Acceptance angle of an Optical Fiber	1
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WEEK	COURSE OUTCOMES	EXPT NO	DESCRIPTION	NO. OF SESSIONS
6,7,8,9	CO3. Develop skills to plot various characteristic curves and to calculate the physical properties of given materials	6	Determine temperature coefficient of a given Thermistor by using its characteristic curves	1
		7	Study the variation of Intensity of Magnetic Field along the axis of a circular coil carrying current by using Stewart-Gee's Apparatus	1
		8	Determine Time constant of a C-R circuit	1
		9	Draw V-I characteristics of a Zener diode in forward and reverse bias. And also find its breakdown voltage	1
10	CO4. Calculate some of the properties of semiconducting materials	10	Determine the energy band gap of a given semiconducting material by using p-n junction diode	1

V. Iwamiryan
Course Coordinator

NA
Module Coordinator

V. Iwamiryan
HOD

[Signature]
Principal