

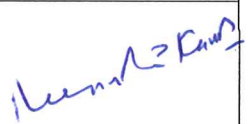
AMR/PHY/BOS/2024-25/MOM/1

Date : 24-09-2024

DEPARTMENT OF PHYSICS

MINUTES OF MEETING - BOARD OF STUDIES (BOS)

The Meeting of the Board of Studies of Physics was held on 24th September 2024 at 03.00 PM through online (Zoom Meeting Platform). The following members were attended the online meeting.

S.No	Name of the Member	Designation/occupation	category	Signature
1	Mr.K.Chandra Sekhar	Head of the Department	Chairman	
2	Dr. G.Padmaja Rani	Professor, Physics Department, UCEK, JNTUK, Kakinada	University Nominee	
3	Dr. T .Madhu Mohan	Professor, Department of Physics, Venkatadri Institute of Technology Guntur	Subject experts outside parent university	
4	Dr. R.V.S.S.N Ravi Kumar	Professor, Acharya Nagarjuna University		
5	Mr. V Bhaskar Reddy	Senior software engineer, Capgemini	Industrialist	
6	Dr. G Bhasakr Reddy	H & S HoD	Faculty Members	
7	Mr. I.Seetharami Reddy	Asst. Professor		

The Meeting began with chairman, Board of studies extending a warm welcome to all the members of participating in the meeting.

The following points were discussed and approved during the meeting

- The following proposed AMR-24 Course Structure and the detailed syllabus of Engineering Physics related subjects of I-I, I-II were presented, discussed and approved.

1. For Group – A (CSE , EEE)

GROUP –A – COURSES (CSE ,EEE)					
I Year – I SEM					
S.No.	Title	Credits	S. No.	Title	Credits
1	Communicative English	2	6	Communicative English Lab	1
2	Chemistry	3	7	Chemistry Lab	1
3	Linear Algebra & Calculus	3	8	Engineering Workshop	1.5
4	Basic Civil & Mechanical Engineering	3	9	Computer Programming Lab	1.5
5	Introduction to Programming	3	10	Health and wellness, Yoga and Sports	0.5
I SEM - TOTAL CREDITS					20.5
I Year – II SEM					
1	Engineering Physics	3	6	IT Workshop	1
2	Differential Equations & Vector Calculus	3	7	Engineering Physics Lab	1
3	Basic Electrical and Electronics Engineering	3	8	Electrical and Electronics Engineering Workshop	1.5
4	Engineering Graphics	3	9	Data Structures Lab / Electrical Circuits Lab	1.5
5	Data Structures / Electrical Circuit Analysis – I (Branch specific)	3	10	NSS/NCC/Scouts & Guides/Community Service	0.5
II SEM - TOTAL CREDIT					19.5

2. For Group –B (ECE, CE, AGE, Cyber Security)

GROUP –B – COURSES (Cyber Security ,ECE,MECH,CE, AGE)					
I Year – I SEM					
S. No.	Title	Credits	S. No.	Title	Credits
1	Engineering Physics	3	6	IT Workshop	1
2	Linear Algebra & Calculus	3	7	Engineering Physics Lab	1
3	Basic Electrical & Electronics Engineering	3	8	Electrical & Electronics Engineering Workshop	1.5
4	Engineering Graphics	3	9	Computer Programming Lab	1.5
5	Introduction to Programming	3	10	NSS/NCC/Scouts & Guides/Community Service	0.5
I SEM - TOTAL CREDITS					20.5
I Year – II SEM					
1	Communicative English	2	6	Communicative English Lab	1
2	Engineering Chemistry / Chemistry	3	7	Engineering Chemistry / Chemistry Lab	1
3	Differential Equations & Vector Calculus	3	8	Engineering Workshop	1.5
4	Basic Civil & Mechanical Engineering	3	9	Engineering Mechanics & Building Practices Lab Engineering Mechanics Lab / Network Analysis and Simulation Lab / Data structures Lab	1.5
5	Engineering Mechanics/ Network Analysis/ Data structures (Branch specific)	3	10	Health and wellness, Yoga and Sports	0.5
II SEM - TOTAL CREDITS					19.5

2. Detailed Syllabus of Physics (T) (Annexure -1) , Physics Lab (L) I Year – I Sem (Annexure -2) , Engineering Physics (T) (Annexure -3), Engineering Physics Lab (L) (Annexure -4)

The following points were suggested for future possible implementations:

1. Suggested to Change the Subject name Physics as it is Engineering Physics.
2. Suggested to Change the Cos reduce from Co6 to Co5.
3. Suggested to keep the unit wise teaching hours.
4. Suggested to remove the topic from the unit-4 (Frequency depends curve)
5. Suggested to mention the virtual lab site


Chairman

BoS – Dept. of Physics

Copy to:

1. Principal

2. IQAC

ANNEXURE – 1

AMR- 24

Engineering Physics

(Common to All branches of Engineering)

L	T	P	C
3	0	0	3

Course Objectives:

To bridge the gap between the Physics in school at 10+2 level and UG level engineering courses by identifying the importance of the optical phenomenon like interference, diffraction etc, enlightening the periodic arrangement of atoms in crystalline solids and concepts of quantum mechanics, introduce novel concepts of dielectric and magnetic materials, physics of semiconductors

Course Outcomes:

CO1:Analyze the intensity variation of light due to polarization, interference and diffraction.

CO2:Familiarize with the basics of crystals and their structures.

CO3:Explain fundamentals of quantum mechanics and apply it to one dimensional motion of particles.

CO4:Summarize various types of polarization of dielectrics and classify the magnetic materials.

CO5: Identify the type of semiconductor using Hall Effect.

UNIT I

12 Hrs

Wave Optics

Interference: Introduction - Principle of superposition –Interference of light - Interference in thin films (Reflection Geometry) & applications - Colours in thin films- Newton's Rings, Determination of wavelength and refractive index.

Diffraction: Introduction - Fresnel and Fraunhofer diffractions - Fraunhofer diffraction due to single slit(Qualitative), double slit & N-slits (Qualitative) – Diffraction Grating - Dispersive power and resolving power of Grating (Qualitative).

Polarization: Introduction -Types of polarization - Polarization by reflection, refraction and Double refraction - Nicol's Prism -Half wave and Quarter wave plates.

UNIT II

8 Hrs

Crystallography and X-ray diffraction

Crystallography: Space lattice, Basis, Unit Cell and lattice parameters – Bravais Lattices – crystal systems (3D) – coordination number - packing fraction of SC, BCC & FCC - Miller indices – separation between successive (hkl) planes.

X-ray diffraction: Bragg's law - X-ray Diffractometer – crystal structure determination by Laue's and powder methods

UNIT III

12 Hrs

Dielectric and Magnetic Materials

Dielectric Materials: Introduction - Dielectric polarization - Dielectric polarizability, Susceptibility, Dielectric constant and Displacement Vector – Relation between the electric vectors - Types of polarizations- Electronic (Quantitative), Ionic (Quantitative) and

polarizations (Qualitative) - Lorentz internal field - Clausius- Mossotti equation - dielectric loss

Magnetic Materials: Introduction - Magnetic dipole moment - Magnetization-Magnetic susceptibility and permeability – Atomic origin of magnetism - Classification of magnetic materials: Dia, para, Ferro, anti-ferro & Ferri magnetic materials - Domain concept for Ferromagnetism & Domain walls (Qualitative) - Hysteresis - soft and hard magnetic materials.

UNIT IV

8 Hrs

Quantum Mechanics and Free electron Theory

Quantum Mechanics: Dual nature of matter – Heisenberg's Uncertainty Principle – Significance and properties of wave function – Schrodinger's time independent and dependent wave equations– Particle in a one-dimensional infinite potential well.

Free Electron Theory: Classical free electron theory (Qualitative with discussion of merits and demerits) – Quantum free electron theory – electrical conductivity based on quantum free electron theory - Fermi-Dirac distribution - Density of states - Fermi energy

UNIT V

8 Hrs

Semiconductors: Formation of energy bands – classification of crystalline solids - Intrinsic semiconductors: Density of charge carriers (Qualitative) – Electrical conductivity – Fermi level – Extrinsic semiconductors: density of charge carriers – dependence of Fermi energy on carrier concentration and temperature - Drift and diffusion currents – Einstein's equation – Hall effect and its applications

Textbooks:

- 1.A Text book of Engineering Physics, M. N. Avadhanulu, P.G.Kshirsagar & TVS Arun Murthy, S. Chand Publications, 11th Edition 2019.
- 2.Engineering Physics - D.K.Bhattacharya and Poonam Tandon, Oxford press (2015)

Reference Books:

- 1.Engineering Physics - B.K. Pandey and S. Chaturvedi, Cengage Learning 2021.
- 2.Engineering Physics - Shatendra Sharma, Jyotsna Sharma, Pearson Education, 2018.
- 3.Engineering Physics” - Sanjay D. Jain, D. Sahasrabudhe and Girish, University Press. 2010

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ANNEXURE -2

AMR- 24

Engineering Physics Lab Syllabus (Common to All branches of Engineering)

L	T	P	C
0	0	2	1

Course Objectives:

To study the concepts of optical phenomenon like interference, diffraction etc., recognize the importance of energy gap in the study of conductivity and Hall effect in semiconductors and study the parameters and applications of dielectric and magnetic materials by conducting experiments.

Course Outcomes:

CO1: Operate optical instruments like travelling microscope and spectrometer.

CO2: Estimate the wavelengths of different colours using diffraction grating.

CO3: Plot the intensity of the magnetic field of circular coil carrying current with distance.

CO4: Evaluate dielectric constant and magnetic susceptibility for dielectric and magnetic materials respectively.

CO5: Calculate the band gap of a given semiconductor.

List of Experiments:

1. Determination of wavelengths of different spectral lines in mercury spectrum using diffraction grating in normal incidence configuration.
2. Verification of Brewster's law
3. Determination of dielectric constant using charging and discharging method.
4. Study the variation of B versus H by magnetizing the magnetic material (B-H curve).
5. Determination of wavelength of Laser light using diffraction grating.
6. Determination of energy gap of a semiconductor using p-n junction diode.
7. Magnetic field along the axis of a current carrying circular coil by Stewart Gee's Method.
8. Determination of temperature coefficients of a thermistor.
10. Determination of acceleration due to gravity and radius of Gyration by using a compound pendulum.
11. Determination of rigidity modulus of the material of the given wire using Torsional pendulum.

30/9/24

T. Radhadevi

Principal

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12.Sonometer: Verification of laws of stretched string. .

Note: Any TEN of the listed experiments are to be conducted. Out of which any TWO Experiments may be conducted in virtual mode.

Virtual lab: vlab.co.in

Reference Books:

A Textbook of Practical Physics - S. Balasubramanian, M.N. Srinivasan, S. Chand Publishers, 2017

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Amrith Kumar
T. Radhika
98/
Gay

SYLLABUS

UNIT II

Crystallography and X-ray diffraction

Crystallography: Space lattice, Basis, Unit Cell and lattice parameters – Bravais Lattices – crystal systems (3D) – coordination number - packing fraction of SC, BCC & FCC - Miller indices – separation between successive (hkl) planes.

X-ray diffraction: Bragg's law - X-ray Diffractometer – crystal structure determination by Laue's and powder methods



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Welcome

To

The BoS Meeting

by

Department of Physics

(Humanities and Sciences)



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