



RISE Krishna Sai Gandhi Group of Institutions::Ongole (AUTONOMOUS)

(Approved by AICTE-New Delhi, Affiliated to JNTUK, Kakinada)

Accredited by NAAC & Recognized under UGC 2(f)

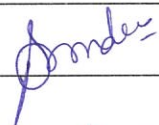
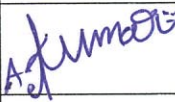
NH-16, Valluru-523272, Ongole, Prakasam District, A.P

DEPARTMENT OF SCIENCE & HUMANITIES

Minutes of Board of Studies Meeting

Date: 31-12-2024

The Second External Board of Studies Meeting of the Department of Science and Humanities was held online on 31.12.2024 at 10:00am via Zoom platform to finalize the syllabus for second semester. The following members were present:

S.N	Name of the Member	Designation	Position	Signature
1	Mrs.P.Sridevi	Head of The Department	Chairman	
2	Dr.G. Padmarajani	Professor in Physics & DE, UCEK, JNTUK, Kakinada.	University Nominee, External BoS Member	
3	Dr.Swapna Koneru	HOD& Associate professor, Department of physics, KL-University	Subject expert, External BoS Member	Approved via E-mail
4	Dr.N.V.Srihari	HOD& Department of Physics, T.R.R. Government Degree College, Kandukur	Subject expert, External BoS Member	Approved via E-mail
5	Mr.A.Venkata Rao	Asst.Professor, Physics	Faculty Member	
6	Mr.A.Anil Kumar	Asst.Professor, Physics	Faculty Member	
7	Dr.K.Jayachandra	Regional Director of Center for Environment and Development, Hyderabad.	Industry	Approved via E-mail
8	Miss.Y.Divya	Software Employee	Alumni	Approved via E-mail

At the onset of the meeting, the Chairman of BoS, P.Sridevi, welcomed all the members. The meeting began with the presentation of the syllabus of **Engineering Physics and Engineering Physics Lab** of I-II semester under RG24 regulations prepared by the internal BOS members.



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Resolutions in Meeting

Agenda: To discuss and finalize the syllabus of **Engineering Physics and Engineering Physics Lab** Under RG24 (Autonomous) regulations for Ist year II semester.

Resolutions: The syllabus of **Engineering Physics and Engineering Physics Lab** under RG24 (Autonomous) regulations is approved by the Board of Studies Committee.

Encl: Annexure-I

General Comments

The University Nominee Dr. G. Padmajarani suggested to

- To remove the complex dielectric constant and Frequency dependence of polarization topics, to ensure proper time management and syllabus coverage. (Topics removed)
- To follow the syllabus which is approved in I semester.

Subject expert comments

1.Dr. Swapna Koneru Madam suggested to

- To follow the syllabus which is approved in I semester.

2) Dr.N.V. Srihari sir suggested to

- To follow the syllabus which is approved in I semester.

3) Dr.K. Jayachandra sir -Industry person Suggested to

- Add a topic for Fundamentals of Space physics. Which all members has given their thoughts and decided to think of this in the next year.
- To follow the syllabus which is approved in I semester.



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ENGINEERING PHYSICS

(Common for all branches of Engineering)

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: Explain the basic concepts of Quantum Mechanics and the band theory of solids.

CO5: Identify the type of semiconductor using Hall effect.

UNIT I Wave Optics

12hrs

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, 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 Crystallography and X-ray diffraction

8hrs

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 Dielectric and Magnetic Materials

8hrs

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 Orientation



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polarizations (Qualitative) - Lorentz internal field - Clausius- Mossotti equation - complex dielectric constant – Frequency dependence of polarization .

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 Quantum Mechanics and Free electron Theory

10hrs

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 Semiconductors

10hrs

Semiconductors: Formation of energy bands – classification of crystalline solids - Intrinsic semiconductors: Density of charge carriers – 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
4. Engineering Physics - M.R. Srinivasan, New Age international publishers (2009).

Web Resources: <https://www.loc.gov/rr/scitech/selected-internet/physics.html>



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ENGINEERING PHYSICS LAB (Common to All Branches of Engineering)

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: The students will be able to

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 radius of curvature of a given Plano-convex lens by Newton's rings.
2. Determination of wavelengths of different spectral lines in mercury spectrum using diffraction grating in normal incidence configuration.
3. Verification of Brewster's law
4. Determination of dielectric constant using charging and discharging method.
5. Study the variation of B versus H by magnetizing the magnetic material (B-H curve).
6. Determination of wavelength of Laser light using diffraction grating.
7. Estimation of Planck's constant using photoelectric effect.
8. Determination of the resistivity of semiconductors by four probe methods.
9. Determination of energy gap of a semiconductor using p-n junction diode.
10. Magnetic field along the axis of a current carrying circular coil by Stewart Gee's Method.
11. Determination of Hall voltage and Hall coefficient of a given semiconductor using Hall effect.
12. Determination of temperature coefficients of a thermistor.
13. Determination of acceleration due to gravity and radius of Gyration by using a compound pendulum.
14. Determination of magnetic susceptibility by Kundt's tube method.
15. Determination of rigidity modulus of the material of the given wire using Torsional pendulum.
16. Sonometer: Verification of laws of stretched string.
17. Determination of young's modulus for the given material of wooden scale by non-uniform bending (or double cantilever) method.
18. Determination of Frequency of electrically maintained tuning fork by Melde's experiment.



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

References:

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

Web Resources

- www.vlab.co.in

<https://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html.prototype>



SH HOD <shhod@risekrishnasaigandhi.edu.in>

Minutes of Meeting for Board of Studies of I Year -II sem

Koneru Swapna <kswapna80@gmail.com>
To: SH HOD <shhod@risekrishnasaigandhi.edu.in>
Cc: Divya <ydivya392@gmail.com>

Tue, Jan 7, 2025 at 12:54 PM

Approved.
withh Regards
Dr K Swapna
Principal Investigator (DST-SERB/ECRA/2015/000335)
Associate Professor & HOD
Department of Physics
(DST-FIST Sponsored Department)
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SH HOD <shhod@risekrishnasaigandhi.edu.in>

Minutes of Meeting for Board of Studies of I Year -II Sem

Nv Srihari <nvsrihariphysics@gmail.com>

Tue, Jan 7, 2025 at 6:46 PM

To: shhod@risekrishnasaigandhi.edu.in

Madam ,
Srihari

I am willing to approve the syllabus,

regards, Dr N V

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**Modified syllabus.pdf**

347K



SH HOD <shhod@risekrishnasaigandhi.edu.in>

Minutes of Meeting for Board of Studies of I Year -II Sem

Jayachandra Kannemadugu <dr.jc.git@gmail.com>
To: SH HOD <shhod@risekrishnasaigandhi.edu.in>

Tue, Jan 7, 2025 at 1:56 PM

Dear sir/madam

The minutes & modified syllabus is approved by me.

Regards.
Dr. K.Jayachandra

On Tue, Jan 7, 2025 at 12:52 PM SH HOD <shhod@risekrishnasaigandhi.edu.in> wrote:

Respected Sir,

I hope you are doing well.

Please find attached the minutes from the recent Board of Studies (BoS) meeting held on 31/12/2024. I kindly request your approval of these minutes via email. If there are any corrections or suggestions, please share them.

Your prompt response will be appreciated. If you approve the minutes as they are, a simple reply stating your approval will suffice.

Thank you for your time and attention

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Mrs P.Sridevi
Head of the Department
Department of Science & Humanities
RISE Krishna Sai Gandhi Group of Institutions
Ongole

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GIS development | Training | Consultancy



SH HOD <shhod@risekrishnasaigandhi.edu.in>

Minutes Of Meeting for Board of Studies of I Year -_II Semister

Divya <ydivya392@gmail.com>

Thu, Jan 9, 2025 at 10:33 AM

To: SH HOD <shhod@risekrishnasaigandhi.edu.in>

HI,

Approved.

Regards,

Y.Divyasree

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