Dr. V.S.KRISHNA GOVERNMENT DEGREE AND PG COLLEGE
(An Autonomous Institution Affiliated to Andhra University
Reaccredited by NAAC with A Grade (3rd Cycle)
District Resource Centre and Centre for Research Studies
Maddilapalem, Visakhapatnam 530013, Andhra Pradesh

Programme: B.Sc. Honours in Physics (Major/Minor)
w.e.f. AY 2023-24 **COURSE CODE 23PHYM21**
SEMESTER-II COURSE 3: MECHANICS AND PROPERTIES OF MATTER
Theory Credits: 3 3 hrs/week

Course Objective:

The course on Mechanics and Properties of Matter aims to provide students with a fundamental understanding of the behaviour of physical systems, both in terms of mechanical motion and in terms of the properties of matter

Learning outcomes:

On Completion of the course, the students will be able to		Knowledge level (Bloom's Taxonomy)
CO 1	Understand and apply the concepts of scalar and vector fields, calculate the gradient of a scalar field, determine the divergence and curl of a vector field	Level 2 (Understanding)
CO 2	Apply the laws of motion, solve equations of motion for variable mass systems	Level 3 (Applying)
CO 3	Define a rigid body and comprehend rotational kinematic relations, derive equations of motion for rotating bodies, analyse the precession of a top and gyroscope, understand the precession of the equinoxes	Level 2 (Understanding) Level 4 (Analysing)
CO 4	Define central forces and provide examples, understand the characteristics and conservative nature of central forces, derive equations of motion under central forces.	Level 2 (Understanding) Level 4 (Analysing)
CO 5	Differentiate between Galilean relativity and the concept of absolute frames, comprehend the postulates of the special theory of relativity, apply Lorentz transformations, understand, and solve problems	Level 2 (Understanding) Level 3 (Applying) Level 4 (Analysing)

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Programme: B.Sc. Honours in Physics (Major/Minor)
w.e.f. AY 2023-24 **COURSE CODE 23PHYM21P**

SEMESTER II COURSE 3: MECHANICS AND PROPERTIES OF MATTER

Practical Credits: 1
2hrs/week

COURSE OBJECTIVE:

To develop practical skills in the use of laboratory equipment and experimental techniques for measuring properties of matter and analysing mechanical systems.

Learning outcomes:

On Completion of the course, the students will be able to		Knowledge level (Bloom's Taxonomy)
CO 1	Mastery of experimental techniques: Students should become proficient in using laboratory equipment and experimental techniques to measure properties of matter and analyze mechanical systems	Level 2 (Understanding) Level 3 (Applying) Level 4 (Analysing)
CO 2	Application of theory to practice: Students should be able to apply theoretical concepts learned in lectures to real-world situations, and understand the limitations of theoretical models.	Level 3 (Applying)
CO 3	Accurate recording and analysis of data: Students should be able to accurately record and analyse experimental data, including understanding the significance of error analysis and statistical methods.	Level 2 (Understanding) Level 3 (Applying) Level 4 (Analysing)
CO 4	Critical thinking and problem solving: Students should be able to identify sources of error, troubleshoot experimental problems, and develop critical thinking skills in experimental design and analysis	Level 2 (Understanding) Level 4 (Analysing) Level 5 (Evaluating)

CO 5	Understanding of physical principles: Students should develop an understanding of the physical principles governing mechanical systems and the properties of matter, including elasticity, viscosity, and thermal expansion.	Level 2 (Understanding) Level 3 (Applying) Level 4 (Analysing)

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Programme: B.Sc. Honours in Physics (Major)

w.e.f. AY 2023-24 **COURSE CODE 23PHYM22**

SEMESTER-II COURSE 4: WAVES AND OSCILLATIONS

Theory Credits: 3 3

Course Objective:

This course provides students with a broad understanding of the physical principles of the oscillations, to help them develop critical thinking and quantitative reasoning skills, to empower them to think creatively and critically about scientific problems and experiments

Learning outcomes:

On completion of the course, the students will be able to		Knowledge level (Bloom's Taxonomy)
CO 1	To describe the basic characteristics of waves such as frequency, wavelength, amplitude, period, and speed.	Level 2
CO 2	To utilize mathematical relationships related to wave characteristics.	Level 3
CO 3	To compare particle motion and wave motion in different types of waves	Level 4
CO 4	To distinguish between Longitudinal and Transverse waves	Level 4
CO 5	To get the knowledge about how to construct and analysis the square waves, saw tooth waves, etc. from Fourier analysis	Level 2

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Programme: B.Sc. Honours in Physics (Major)
w.e.f. AY 2023-24 **COURSE CODE 23PHYM22P**

SEMESTER II COURSE 4 Lab: WAVES AND OSCILLATIONS

Practical Credits: 1
2hrs/week

COURSE OBJECTIVE:

To develop practical skills in the use of laboratory equipment and experimental techniques for measuring properties of matter and analysing mechanical systems.

Learning outcomes:

On Completion of the course, the students will be able to		Knowledge level (Bloom's Taxonomy)
CO 1	Students are made to determine the unknown frequency of tuning fork by volume resonator experiment	Level 4
CO 2	Students are made to determine 'g' by compound/bar pendulum	Level 4
CO 3	Students are made to determine the force constant of a spring by static and dynamic method	Level 4
CO 4	Students are made to determine the elastic constants of the material of a flat spiral spring	Level 4
CO 5	Students are made to verify the laws of vibrations of stretched string–sonometer	Level 2
CO 6	Students are made to determine the frequency of a bar –Melde's experiment.	Level 2
CO 7	Students are made to study the damped oscillation using the torsional pendulum immersed in liquid-decay constant and damping correction of the amplitude.	Level 4
CO 8	Students are made to form Lissajous figures using CRO.	Level 2