Module Code:	Phy - 103
Module title:	Physics – II (Waves & Oscillation)
Name of Scheme:	BS Chemistry (4 Years)
Semester :	2nd
Module Type:	General

Module Rating: 2 Credits

1. **Description and Objectives:**

This course provides students an insight of the principles of waves as carriers of energy including sound and optical waves mainly. This course also provides the 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.

2. **Course Contents**

Harmonic Oscillations

|Simple harmonic oscillation (SHM); Application of S H M; SHM and uniform circular motion, combinations of Harmonic motion Damped Harmonic Motion.

Wave Topic:

Mechanical waves; Traveling waves; Waves speed; Waves equation; Power and intensity in wave motion; Principle of superposition. (Basic ideas);

Sound topic:

Beats Phenomenon; Doppler Effect.

Thermodynamics and Kinetic Theory of Gases:

Kinectic theory of the ideal gas, work done on an ideal gas internal energy of ana ideal gas intermolecular forces.

Statistical Mechanics:

Statistical, Distribution and Mean values; Distribution of molecular speeds; Brownian motion.

Heat:

Review of previous concepts; First law of Thermodynamics; Transfer of heat;

Entropy and Second law of Thermodynamics:

Reversible and irreversible process, Second law; Cycle; Carnot engines Thermodynamic temperature scale; Entropy; Joule-Thomson effect.

3. **Teaching-learning Strategies**

1. Lectures
2. Group Discussion
3. Laboratory work
4. Seminar/ Workshop

4. **Learning Outcome:**

After completion of this course, students will

1. Apply, knowledge of fluids, thermodynamics, sound waves, and light waves to explain natural physical processes and related technological advances.
2. Use an understanding of calculus along with physical principles to effectively solve problems encountered in everyday life, further study in science, and in the professional world.
3. Design experiments and acquire data in order to explore physical principles, effectively communicate results, and critically evaluate related scientific studies.
4. Assess the contributions of physics to our evolving understanding of global change and sustainability while placing the development of physics in its historical and cultural context.

6. **Assessment Strategies**:

1. Lecture Based Examination (Objective and Subjective)
2. Assignments
3. Class discussion
4. Quiz
5. Tests

7. **Recommended Readings:**

1. Physics Vol. I & II (extended) by Resnick, Halliday and Karne, 4th and Sons Inc, New York.
2. Fundamentals of Physics by Halliday Resnick and Krane, John Wiley and Sons Inc, New York.
3. University Physics 8th Edition by Sears, Zemansky and Young, Addison – Wesley, Reading (MA), USA

4. Physics by Alonso and Finn; Addison-Wesley, Reading (MA) USA.

Module Code:	Phy - 104
Module title:	Physics – II (Physics Lab)
Name of Scheme:	BS Chemistry (4 Years)
Semester :	2nd
Module Type:	General
Module Rating:	1 Credits

1. Introduction of the Course:

Topics include concepts in fluid mechanics, waves, thermodynamics and optics.

2. Course Objectives

This is a calculus-based physics course required for students majoring in engineering, physics and chemistry. The course is transferable to other baccalaureate engineering programs. Students should be aware of the program requirements of the institutions to which they wish to transfer. This course conforms with the Oregon Block Transfer program.

3. Course Contents

1. Thermo-couple, Thermal e.m.f. and temperature diagram.
2. Determination of 'J' Electrical Method (Calendar and Barnes Method) with compensation for heat loss.
3. Velocity of Sound by Kundt's tube.
4. Frequency & A.C. mains by Sonometer.
5. Frequency & A.C. mains by Melde's Approvals.
6. Use of sextant and measurement of altitude with it.
7. Wavelengths of sodium D lines by Newton's biprism.
8. Wavelengths of light by Fresnel's biprism
9. Wavelength of light by diffraction gratting.
10. Measurement of the Rotation of the Plane of Polarization.
11. Resolving Power of diffraction gratting.
12. Determination of the radius of Lycopodium Particles.

1. Lectures
2. Group Discussion
3. Laboratory work
4. Seminar/ Workshop

5. Learning Outcome:

1. Apply knowledge of fluids, thermodynamics, sound waves, and light waves to explain natural physical processes and related technological advances.
2. Use an understanding of calculus along with physical principles to effectively solve problems encountered in everyday life, further study in science, and in the professional world.
3. Design experiments and acquire data in order to explore physical principles, effectively communicate results, and critically evaluate related scientific studies.
4. Assess the contributions of physics to our evolving understanding of global change and sustainability while placing the development of physics in its historical and cultural context

6. **Assessment Strategies**:

1. Lecture Based Examination (Objective and Subjective)
2. Assignments
3. Class discussion
4. Quiz
5. Tests

7. <u>Recommended Readings</u>:

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