



Course Outline of PHY109

Course Code : PHY 109
Pre-requisite : None
Credit Hours : 4 (Theory+Lab)
Course Title : Engineering Physics- I (Introductory Classical Physics)

Course Instructor : **Dr. Md. Nure Alam Abdullah (DMNAA)**
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&
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Class Time :

Section	Day	Time	Room
10	ST	11:50-1:20	FUB-403

Objectives of the course:

Physics is the subject that deals with the principles of laws of matter and energy. To build up a career in engineering discipline it is very important to have knowledge of Physics. Physics is the basic/fundamental subject in science and engineering. Physics plays always an important role in developing new technology. The course Engineering Physics-I has been designed to give a clear concept in the area of mechanics, fluid dynamics, SHM, waves (mechanical and electromagnetic), thermal processes and optics. All these areas are basic/fundamental in Physics. The concepts in these areas can help the students studying different engineering and communication courses.

Course Learning Outcomes:

After completing this PHY109 course students will be able to

1. apply the concept of force in their higher courses.
2. understand the fluid flow and concepts of Continuity and Bernoulli's equations
3. know the different types of waves and how waves convey energy.
4. know thermodynamic laws and entropy and ideal heat engine.
5. know about light and interference of light, diffraction of light and polarization of light.
6. know about the concept of electric and magnetic fields and different laws related to electromagnetism.

Course Contents /Descriptions:

1. Mechanics: Newton's law of motion; Momentum, impulse, Collisions; Kinetic energy, potential energy and work; Rotation of rigid body; Rotational dynamics; Equilibrium of rigid bodies.

2. Fluid Mechanics: Concept of fluids; Pressure and density; Measurement of pressure; General concept of fluid flow; The equation of continuity; Bernoulli's equation; Applications.

3. Oscillations and Waves: Simple harmonic oscillation, energy in SHM, damped harmonic motion; Different types of waves; The superposition principle; Wave speed; Energy and Power of traveling wave along string; Interference of waves; standing waves and resonance.

4. Thermal Physics: Concept of temperature and heat; isothermal and adiabatic changes; Reversible and irreversible processes; Three laws of thermodynamics; Thermodynamics and the concept of entropy, Heat engine.

5. Electricity and Magnetism: Concept of electric charge, the electric field, dipole in an electric field, electric flux, Gauss' law, electric potential, calculation of capacitance, capacitors with dielectric, energy storage in an electric field. The magnetic field, Biot-Savart law, Ampere's law, magnetic force on a current, magnetic lines of induction, Faraday's law, Lenz's Law.

6. Physical Optics: Light as electromagnetic wave; interference, diffraction of light, polarization of light; Young's double slit experiment; Michelson interferometer, Poynting vector.

Text Book:

1. Fundamentals of Physics; Halliday, Resnick and Krane, 10th Edition, Wiley & Sons.

Reference book:

1. University Physics; Sears and Zemansky, Hugh D. Young, Roger A. Freedman, Pearson Education, Inc. London, UK.
2. Mechanics, Wave Motion & Heat; Sears, F.W.; Addison Wesley Publishing Company
3. Electricity and Magnetism, Dakworth, H. E.
4. Introduction to Optics, By Frank L. Pedrotti, Leno M. Pedrotti, Leno S. Pedrotti

Examination Schedule:

Section	Last Class Date & Day		Mid Term Date & Day		Final Exam Date & Day	
10	26 December 2023	Tuesday	14 November 2023	Tuesday	31 December 2023	Sunday

Score Distribution:

Quiz	Lab	Mid-Semester	Presentation	Attend	Final
10	25	20	10	5	30

Grading Policy:

Marks (%)	Letter Grade	Grade Point
80% and above	A+	4.00
75% to less than 80%	A	3.75
70% to less than 75%	A-	3.50
65% to less than 70%	B+	3.25
60% to less than 65%	B	3.00
55% to less than 60%	B-	2.75
50% to less than 55%	C+	2.50
45% to less than 50%	C	2.25
40% to less than 45%	D	2.00
below 40%	F	0.00

Important Dates:

October 09, 2023	Last day to clear Incomplete grades ("I" grade)
October 10, 2023	Last day to drop the course(s)/ Semester with 100% refund
October 26, 2023	Last day to drop the course(s)/ Semester with 85% refund
November 27, 2023	Last day to drop the course(s)/ Semester with 50% refund
December 14, 2023	Last day of withdrawal of course(s) with ("W" grade)

Special Instructions:

- There will be no make-up quizzes
- Make-up exams for Mid-Semester may be taken in case of a valid reason. The student has to apply for a make-up exam with proper documents.
- Regular class attendance will be taken. The students are advised to attend classes regularly and keep regular contact with the instructor for academic problems.
- There is zero tolerance for cheating at EWU. Students caught with cheat sheet in their possession, whether used or not used, &/ or copying from cheat sheets, writings on the palm of hand, back of calculator, chairs or nearby walls, etc. would be treated as cheating in the exam hall. The only penalty for cheating is expulsion.



Date: September 30, 2023

(Dr. Md. Nure Alam Abdullah)