

MODULE SPECIFICATION

Module Title	College Physics
Module Code	PHYS 101
Credits	4
Pre-requisites (including Year 1)	College Algebra or Precalculus

Description

Course Overview
This course introduces the fundamental principles of physics, emphasizing conceptual understanding, mathematical reasoning, and problem-solving techniques. Students will explore mechanics, energy, waves, thermodynamics, electricity, magnetism, and modern physics concepts, focusing on how physical laws describe and predict natural phenomena. This non-lab version focuses on theoretical and analytical applications without hands-on experiments.
Method of Teaching and Learning
This module will be taught using a combination of lectures, tutorials and consultation hours. Learning will also be reinforced by appropriate readings from the course text.
Syllabus
<p>Modules</p> <p>Module 1 - Introduction & Motion</p> <ul style="list-style-type: none"> Units, dimensions, and measurement Vectors and scalars Motion in one and two dimensions Graphical analysis of motion <p>Module 2 - Forces and Newton's Laws</p> <ul style="list-style-type: none"> Newton's three laws of motion Free-body diagrams and equilibrium Friction and circular motion <p>Module 3 - Work, Energy, and Power</p>

- Work-energy theorem
- Conservation of mechanical energy
- Power and efficiency

Module 4 - Momentum and Collisions

- Linear momentum and impulse
- Conservation of momentum
- Elastic and inelastic collisions

Module 5 - Rotational Motion

- Torque, angular acceleration, and moment of inertia
- Rotational kinetic energy
- Conservation of angular momentum

Midterm 1

Module 6 - Gravitation and Planetary Motion

- Newton's law of gravitation
- Kepler's laws of planetary motion
- Gravitational potential energy

Module 7 - Fluid Mechanics

- Density and pressure
- Pascal's principle and buoyancy
- Bernoulli's equation and fluid flow

Module 8 - Oscillations and Waves

- Simple harmonic motion
- Wave properties and interference
- Sound waves and the Doppler effect

Module 9 - Thermodynamics

- Temperature and heat
- Heat transfer and calorimetry
- Laws of thermodynamics and engines

Midterm 2

Module 10 - Electricity

- Electric charge, fields, and potential
- Capacitance and energy storage
- Direct current circuits and Ohm's law

Module 11 - Magnetism

- Magnetic fields and forces
- Motion of charged particles in magnetic fields
- Electromagnetic induction and Faraday's law

Module 12 - Optics

- Reflection and refraction
- Lenses, mirrors, and optical instruments
- Interference and diffraction

Module 13 - Modern Physics

- Special relativity and time dilation
- Photoelectric effect and atomic models
- Quantum mechanics and nuclear physics overview

Final Exam

Assessment

Assessment Type	% of Final Mark
Midterm 1	25%
Midterm 2	25%
Final Exam	30%
Homework & Quizzes	10%
Course Participation	10%

<i>Range</i>	<i>Letter Grade</i>
90% - 100%	A
80% – 89%	B
70% - 79%	C
60% - 69%	D
< 60%	U

Textbooks

Mandatory Textbooks

Title	Editor/Author	ISBN/Publisher
<i>College Physics: A Strategic Approach</i> , 5th Edition	Randall D. Knight, Brian Jones, and Stuart Field	9780137571544

Optional Textbooks

Title	Author	ISBN/Publisher
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Reference Textbooks

Title	Author	ISBN/Publisher
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