

INTRODUCTION TO GENERAL PHYSICS II

Course Number: **1022**

Section: **001-006**

1. Instructor Information

Name: Dr. Ergin H. Ahmed

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E-mail: erahmed@temple.edu

Phone: 215-204-1398

Office Hours: Tuesday 14:00 – 16:00, Thursday 14:00 – 16:00

2. Textbook

Title: *Essential College Physics, with MasteringPhysics, Volume 2* (2010).

Authors: Andrew Rex and Richard Wolfson

Publisher: Pearson/Addison-Wesley

ISBN: 978-0321611192

3. Teaching support coordinator

Name: Dr. Elena Borovitskaya

Office: SERC 468

<https://phys.cst.temple.edu/physics-help.html>

4. Examination

There will be two in-class closed-book midterm exams and a final exam.

Midterm Exam 1: Tuesday, February 10

Midterm Exam 2: Tuesday, March 17

Final Exam: Thursday, April 30, 10:30 – 12:30, SERC110.

The final exam will cover all topics studied in the course. Make-up exams may be permitted only under extraordinary circumstances (illness, family emergency etc.). If you anticipate a scheduling conflict, you may arrange to take the exam ahead of time.

In addition to the midterm and the final exams there will be online homework assignments using MasteringPhysics (course ID: MPAHMED85725) as well as few quizzes during the semester. The quizzes will be administered at the end of the lecture

and will have duration of 30 min. The date and the material included in each quiz will be announced a week before.

5. Grading

- Labs 15%
- Quizzes and homework assignments 20 %
- Midterm 1 exam 15 %
- Midterm 2 exam 20 %
- Final Exam 30 %

Approximate letter grade assignment:

A	100% to 90%
A-	90% to 85%
B+	85% to 80%
B	80% to 75%
B-	75% to 70%
C+	70% to 67%
C	67% to 60%
C-	60% to 55%
D	55% to 45%
F	45% to 0%

6. Syllabus

15. Electric Charges, Forces, and Fields

- 15.1. Electric Charges
- 15.2. Coulomb's Law
- 15.3. Coulomb's Law for Multiple Charges
- 15.4. Electric Fields
- 15.5. Charged Particles in Electric Fields

16. Electric Energy, Potential, and Capacitors

- 16.1. Electric Potential Energy
- 16.2. Electric Potential
- 16.3. Electric Potential and Electric Field
- 16.4. Capacitors
- 16.5. Dielectrics

17. Electric Current, Resistance, and Circuits

- 17.1. Current and Resistance
- 17.2. Batteries: Real and Ideal

- 17.3. Combining Resistors
- 17.4. Electric Energy and Power
- 17.5. RC Circuits
- 17.6. Semiconductors and Superconductors

18. Magnetic Fields and Forces

- 18.1. Magnets, Poles, and Dipoles
- 18.2. Magnetic Forces on a Moving Charge
- 18.3. Application of Magnetic Forces
- 18.4. Magnetic forces on Conducting Wires
- 18.5. The Origins of Magnetism
- 18.6. Magnetic Materials

19. Electromagnetic Induction and Alternating Currents

- 19.1. Induction and Faraday's Law
- 19.2. Motional emf
- 19.3. Generators and Transformers
- 19.4. Inductance
- 19.5. AC Circuits

20. Electromagnetic Waves and Special Relativity

- 20.1. Electromagnetic Waves
- 20.2. The Electromagnetic Spectrum
- 20.3. The Fundamental Speed c
- 20.4. Relativity of Time and Space
- 20.5. Relativistic Velocity and Doppler Effect

21. Geometrical Optics

- 21.1. Reflection and Plane Mirrors
- 21.2. Spherical Mirrors
- 21.3. Refraction and Dispersion
- 21.4. Thin Lenses
- 21.5. Microscopes and Telescopes
- 21.6. The Eye and Vision

22. Wave Optics

- 22.1. Interference
- 22.2. Double-Slit Interference
- 22.3. Diffraction
- 22.4. Polarization and Scattering

23. Modern Physics

- 23.1. Quantization
- 23.2. Black Body Radiation and Plank's Constant
- 23.3. Photons
- 23.4. Wave Particle Duality

24. Atomic Physics

- 24.1. The Nuclear Atom
- 24.2. The Bohr Atom

- 24.3. Quantum Numbers and Atomic Spectra
- 24.4. Multi-Electron Atoms and the Periodic Spectra
- 24.5. Radiation from Atoms

25. Nuclear Physics

- 25.1. Nuclear Structure
- 25.2. The Strong Force and Nuclear Stability
- 25.3. Radioactivity
- 25.4. Activity and Half-Life
- 25.5. Nuclear Fission
- 25.6. Fusion

26. A Universe of Particles

- 26.1. Particles and Antiparticles
- 26.2. Particles and Fundamental Forces
- 26.3. Classifying Particles
- 26.4. Quarks
- 26.5. Particle Accelerators
- 26.6. Particles and the Universe