

JAMESTOWN COMMUNITY COLLEGE
State University of New York

INSTITUTIONAL COURSE SYLLABUS

Course Title: Analytical Physics II

Course Abbreviation and Number: PHY 2710

Credit Hours: 4

Course Type: Lecture/Lab

Course Description: Students continue their investigation into physical phenomenon by focusing on electric and magnetic interactions and the structure of matter. Students will develop an understanding of Maxwell's equations from a detailed treatment of the laws of Coulomb, Ampere, and Faraday. They will use an investigative approach to get an intuitive understanding of electric and magnetic fields and their interactions with charged matter. Students will use vector calculus concepts such as line and surface integrals and will become familiar with the operation of meters and computer based data acquisition devices. Students will also study geometric and physical optics. The course will end with perplexing problems of noncovariance of the electromagnetic theory of Maxwell. The answers to these questions lead to the study of modern physics topics.

Prerequisite: PHY 1710; Prerequisite/Corequisite: MAT 2650.

General Education Requirements Met

SUNY

Natural Sciences

JCC

Scientific Reasoning

Student Learning Outcomes:

Students who demonstrate understanding can:

1. Write laboratory reports using proper grammar in which they:
 - a. describe a purpose
 - b. propose a hypothesis
 - c. summarize and analyze observations
 - d. draw a conclusion
2. Design and interpret graphs or tables of data.
3. Demonstrate an understanding of conceptual physics.
 - a. Electric Fields and Forces
 - b. Magnetic Fields and Forces
 - c. Maxwell's Equations
 - d. Electric and Magnetic Potential Energy /Potential
 - e. E&M waves
 - f. Simple Circuits
 - g. Geometric Optics
 - h. Kirchoff's Rules
 - i. Physical Optics
 - j. RC and RLC circuits
 - k. Energy conservation
4. Choose effective problem solving techniques in the area of:
 - a. Coulomb's Law
 - b. Gauss's Law
 - c. Kirchoff's Rules
 - d. Electric fields and forces
 - e. RC circuits; RLC circuits
 - f. Magnetic fields and forces
 - g. AC devices
 - h. Simple circuits
 - i. E&M waves
 - j. Geometric and Physical Optics
5. Employ a computer to either collect information or data. Students will also employ a computer for data analysis.
6. Demonstrate successful collaboration in the laboratory and/or classroom.
7. Demonstrate competency with standard laboratory equipment.

A pre-requisite for this course is approved for the SUNY General Education category listed. This course will reinforce the student learning outcomes for this category.

Topics Covered:

- Electric Charges and Forces
 - The Electric Field
 - Gauss's Law
 - The Electric Potential
 - Potential and Field
 - Current and Resistance
 - Fundamentals of Circuits
 - The Magnetic Field
 - Electromagnetic Induction
 - Electromagnetic Fields and Waves
 - AC Circuits
 - Traveling Waves and Superposition
 - Wave Optics
 - Oscillations and SHM systems (if time permits)
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Information for Students

- Expectations of Students
 - [Civility Statement](#)
 - [Student Responsibility Statement](#)
 - [Academic Integrity Statement](#)
 - [Accessibility Services](#)

Students who require accommodations to complete the requirements and expectations of this course because of a disability must make their accommodation requests to the Accessibility Services Coordinator.
 - [Get Help: JCC & Community Resources](#)
 - [Emergency Closing Procedures](#)
 - Course grade is determined by the instructor based on a combination of factors, including but not limited to, homework, quizzes, exams, projects, and participation. Final course grade can be translated into a grade point value according to the following:

A=4.0	B+=3.5	B=3	C+=2.5	C=2	D+=1.5	D=1	F=0
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 - Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, VA appointments) are welcome and encouraged to communicate these to the instructor.
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Effective Date: Fall 2021