

College of San Mateo
Official Course Outline

1. **COURSE ID:** PHYS 221 **TITLE:** General Physics II-Calculus Supplement

Units: 1.0 units **Hours/Semester:** 16.0-18.0 Lecture hours; and 32.0-36.0 Homework hours

Method of Grading: Letter Grade Only

Prerequisite: Completion of or concurrent enrollment in MATH 242 or MATH 252 and completion of or concurrent enrollment in PHYS 220.

2. **COURSE DESIGNATION:**

Degree Credit

Transfer credit: CSU; UC

3. **COURSE DESCRIPTIONS:**

Catalog Description:

Application of calculus to topics in Physics 220. Primarily intended for majors requiring one year of calculus-based physics.

4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**

Upon successful completion of this course, a student will meet the following outcomes:

1. Identify problems involving electricity and magnetism, optics, and modern physics which should be solved using differential calculus and correctly solve them.
2. Identify problems involving electricity and magnetism, optics, and modern physics problems which should be solved using integral calculus and correctly solve them.

5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**

Upon successful completion of this course, a student will be able to:

1. Identify problems involving electricity, magnetism, optics, and modern physics which should be solved using differential calculus and correctly solve them.
2. Identify problems involving electricity, magnetism, optics, and modern physics which should be solved using integral calculus and correctly solve them.

6. **COURSE CONTENT:**

Lecture Content:

Coulomb's Law

Gauss's Law

Electrostatic Potential and It's Gradient

The Biot-Savart Law

Ampere's Law

Faraday's Law

The Principle of Least-Time

Wavefunctions and Quantum Mechanics

Nuclear Decay

7. **REPRESENTATIVE METHODS OF INSTRUCTION:**

Typical methods of instruction may include:

- A. Lecture
- B. Discussion
- C. Other (Specify): Lecture with Examples. Guided problem solving. Out of class assignments are homework problems that illustrate and elaborate on the topics covered in lecture.

8. REPRESENTATIVE ASSIGNMENTS

Representative assignments in this course may include, but are not limited to the following:

Writing Assignments:

Solve written homework problems requiring set-up and step-by-step solution using standard mathematical notation.

Reading Assignments:

Reading supplementary handouts.

Other Outside Assignments:

9. REPRESENTATIVE METHODS OF EVALUATION

Representative methods of evaluation may include:

- A. Exams/Tests
- B. Homework
- C. Graded homework assignments and exams.

10. REPRESENTATIVE TEXT(S):

Possible textbooks include:

- A. Young, Adams, and Chastain. *College Physics*, 11th ed. Pearson, 2019

Other:

- A. Physics 221 Worksheets written by CSM Physics faculty, continually revised.

Origination Date: November 2020

Curriculum Committee Approval Date: December 2020

Effective Term: Fall 2021

Course Originator: David Locke