

JEFFERSON COLLEGE

COURSE SYLLABUS

PHY224

GENERAL PHYSICS II

5 Credit Hours

Prepared by:
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Revised by: Dr. Bob Brazzle
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Minor Revision or Update by: Fran Moore
Per Curriculum Committee Process Change: April 25, 2018

Ms. Linda Abernathy, Division Chair, Math, Science, & Business
Ms. Shirley Davenport, Dean, Arts & Science Education

PHY224 General Physics II

I. CATALOG DESCRIPTION

- A. Pre-requisite and/or Co-requisites:
- PHY223 and MTH185 with a grade of C or better. MTH185 may be taken concurrently if student took MTH180 while enrolled in PHY223, and if both courses were passed with a grade of C or better.
 - Reading proficiency
- B. 5 semester hours credit
- C. General Physics II is the second course in the physics sequence for all physics, chemistry, mathematics, and pre-engineering majors and is an in-depth study of electricity and magnetism, light, and waves. Laboratory time is required. This course is required for the Associate of Science degree. (S)
- D. Curricular alignment:
- Elective course applies toward AA or AAT degree.
 - Fulfills AS degree requirement.

II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

Expected Learning Outcomes	Assessment Measures
Gain experience using an authentic scientific inquiry process	Classroom discussions, homework, labs, exams
Understand the basic laws and principles of physics	Classroom discussions, homework, labs, exams
Interpret and analyze physical problems	Classroom discussions, homework, labs, exams
Use experimental techniques and technology to analyze physical problems	Laboratories and lab write-ups
Learn the various mathematical methods used in the solution of problems	Classroom discussions, homework, labs, exams

III. OUTLINE OF TOPICS

- A. Electrical interactions.
1. Coulomb's Law will be understood as the basic law for electrostatic forces
 2. Understand the philosophical underpinnings of the electric field
 3. Analyze Gauss' Law
- B. Electric potential
1. Extend the concept of energy to electrical potential energy
 2. Discuss electromotive force
 3. Differentiate between electric potential difference and energy.

- C. Capacitance
 - 1. Define capacitance
 - 2. Give examples of the uses of capacitors
 - 3. Solve for combinations of capacitors.

- D. Resistance and direct current circuits
 - 1. Understand that Ohm's Law is the basic relationship between current and voltage.
 - 2. Solve for combinations of resistors
 - 3. Analyze Kirchoff's Laws
 - 4. Model the flow of electrical energy in the data acquisition devices

- E. Magnetism
 - 1. Define magnetism
 - 2. Repeat Oersted's discovery
 - 3. Analyze Ampere's Law
 - 4. Compare Ampere's Law to the Biot-Savart Law

- F. Alternating current circuits
 - 1. Evaluate the relationship between DC, AC and digital circuits
 - 2. Describe power in AC circuits
 - 3. Compare Self and mutual inductance
 - 4. State Faraday's Law

- G. Wave and resonance phenomena
 - 1. Modeling resonance and harmonics with sound waves
 - 2. Electromagnetic waves
 - 3. Geometric and wave optics
 - 4. Resonant behavior in atomic and quantum systems

IV. METHODS OF INSTRUCTION

- A. Lecture
- B. Classroom discussion
- C. Homework
- D. Laboratories

V. REQUIRED TEXTBOOK

Sears and Zemansky/Young and Freedman; *University Physics* (current edition).
Boston: Pearson.

VI. REQUIRED MATERIALS

Calculator and a flash drive

VII. SUPPLEMENTAL REFERENCES

None

VIII. METHODS OF EVALUATION

A. Examinations

B. Required homework; some homework may be evaluated using the online service *Mastering Physics* linked through Blackboard

C. Lab write-ups. Students are also graded on spelling and grammar.

IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (TC 101; phone 636-481-3169).

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, <http://www.jeffco.edu>).

XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.