









**Syllabus**  
**PHYS 1420**  
**Elementary General Physics II**  
**2025**

**Committee Members:**

N/A, Central Community College  
Joe Sherwin, Metropolitan Community College  
Jared Daily, Mid-Plains Community College  
David Heidt, Northeast Community College  
Paul Haar, Michael Harrison, & Kent Reinhard, Southeast Community College  
Erandi Gunapala & Lorin King, Western Nebraska Community College  
N/A, Little Priest Tribal College  
N/A, Nebraska Indian Community College

**Facilitator: Paul Haar**

**The Institution agrees to the contents in this syllabus including course prefix, number, course description and other contents of this syllabus.**

 Chief Academic Officer, Central Community College	11/26/2024	Adopt
 Chief Academic Officer, Little Priest Tribal College	11/13/2024	Not Offered
 Chief Academic Officer, Metropolitan Community College	11/13/2024	Decline
 Chief Academic Officer, Mid-Plains Community College	11/12/2024	Adopt
 Chief Academic Officer, Nebraska Indian Community College	11/26/2024	Adopt
 Chief Academic Officer, Northeast Community College	11/15/2024	Adopt
 Chief Academic Officer, Southeast Community College	11/13/2024	Adopt
 Chief Academic Officer, Western Nebraska Community College	11/12/2024	Adopt



## **I. CATALOG DESCRIPTION**

PHYS1420

Elementary General Physics II with algebra and trigonometry

Prerequisite: PHYS 1410 Elementary General Physics I or equivalent

Credit Hours: 5 (Semester) 7.5 (Quarter)

Contact Hours: Lecture 60 Lab 30

**Course Description:** Detailed algebra and trigonometry continuation of Elementary General Physics I. Topics covered will include electricity, magnetism, and optics. Additional topics from the areas of oscillations and waves, fluids, thermal physics, and modern physics may also be covered.

## **II. COURSE OBJECTIVES/COMPETENCIES**

Course will:

1. Introduce the concepts and applications of electrostatics.
2. Provide methods of analyzing the electric fields, forces, and potential.
3. Introduce basic information on capacitance including concepts and calculations.
4. Define concepts and techniques for direct-current circuit analysis.
5. Introduce the concepts of magnetism.
6. Provide methods of analyzing magnetic fields and forces.
7. Present concepts and applications of electromagnetic induction.
8. Implement concepts and techniques to analyze alternating current circuits.
9. Employ the basic principles of wave motion and wave interaction, including how they apply to electromagnetic waves.
10. Present concepts and applications of geometric optics.
11. Present techniques for analysis of experimental data.
12. Provide experience communicating experimental results.

## **III. STUDENT LEARNING OUTCOMES**

Students will be able to:

1. Apply the concepts of electrostatics.
2. Analyze electric fields, forces, and potential.
3. Explain the basic concepts and applications of capacitance.
4. Perform analysis of direct-current circuits.
5. Apply the concepts of magnetism.
6. Perform calculations involving magnetic fields and forces.
7. Explain the concepts of electromagnetic induction.
8. Implement concepts and techniques to analyze alternating current circuits.
9. Employ the basic principles of wave motion and wave interaction, including how they apply to electromagnetic waves.
10. Demonstrate the concepts and applications of geometric optics.
11. Use various techniques to collect and analyze experimental data.
12. Communicate experimental results.
13. Employ the basic principles of wave motion and wave interaction as they apply to electromagnetic radiation (light) in various media.

#### **IV. COURSE CONTENT/TOPICAL OUTLINE**

(Sequence may vary)

1. Electric Charges and Fields
2. Electric Potential
3. Capacitance
4. Current and Resistance
5. Direct-Current Circuits
6. Magnetic Forces and Fields
7. Sources of Magnetic Fields
8. Electromagnetic Induction
9. Electromagnetic Waves
10. The Nature of Light
11. Geometric Optics and Image Formation
12. Interference
13. Diffraction

#### **V. INSTRUCTIONAL MATERIALS**

##### **SUGGESTED TEXTBOOKS AND/OR MATERIALS**

OpenStax College Physics or other appropriate Open Educational Resource

College Physics – Knight, Jones, and Field

Physics – Giancoli

College Physics – Young

#### **VI. METHODS OF PRESENTATION**

Methods of presentation may include lecture, small group activities, videos, lab activities, worksheets, quizzes, online exploration, and student presentations.

#### **VII. METHODS OF EVALUATION**

1. Unit Tests
2. Comprehensive Final Exam
3. Quizzes
4. Assignments
5. Lab Activities

#### **VIII. INSTITUTIONAL DEFINED SECTION**

*To be used at the discretion of each community college as deemed necessary.*