



**Course Name: PHY-134 Physics for Engineering Physics II**

Date Updated: 2/2022

Credit Hours/week: Lab 1 hrs./wk. – 1 cr.

BEGINNING: SPRING 2022

Catalog Description: This is the first course of a two-semester laboratory sequence designed for students who are enrolled concurrently in the Engineering Physics lecture sequence. The course emphasizes fundamental physics principles through experimentation, principles of experiment design, instrumentation, techniques of observation, data recording, data analysis and formal communication of experimental results. Experiments study selected mechanical, electrical and magnetic phenomena

Prerequisite: PHY-130, PHY-133

Text: Einstein, Engineering Physics Lab Manual II, CPS

Craven, Computer Techniques for Physics, CPS

Supplementary Material: Scientific Calculator & Quadrille Paper

Specialized equipment, supplies, facilities, for classes limited by enrollment or restricted by accreditation and/or equipment limitations:

Syllabus:

Topics
Graphs, significant figures, and experimental error (Chapter 1)
Conservation of linear momentum (Chapter 5)
Moment of inertia (Chapter 6)
Newton's second law (Chapter 7)
Electrostatic demonstrations
Simple harmonic motion (Chapters 8 & 9)
Standing waves in string (Chapter 10)
Electric fields and equipotential surfaces (Chapter 13)
Elementary electric charge (Chapter 11)
Joule experiment (Chapter 12)
Basics of direct current circuits (Chapter 14)
Voltmeter - ammeter method for measuring resistance (Chapter 15)
Wheatstone bridge (Chapter 16)
Cathode ray oscilloscope (Chapter 18)
Review & problems

*Format for Offering this Course: Traditional*

Students are expected to adhere to the policies of the County College of Morris. These can be accessed at: (insert link here)

## **Statement of Expected Course LEARNING OUTCOMES**

- Derive the parameters that describe simple harmonic oscillation based on experimental data.
- Sketch standing wave modes for a described system and use the patterns to determine corresponding wavelength, frequency, and velocity values from given provided data.
- Compute the electric field as function of position by direct measurements of an electric field in a laboratory environment.
- Properly construct an electrical circuit and use a digital voltmeter (DVM) to measure voltage, current and resistance.
- Write a properly formatted laboratory report that documents the experimental process that was used, tabulates the data collected, graphs the results when applicable and derives a conclusion based on the experiment.
- Use the scientific method to analyze and derive conclusions from collected data and information (Gen Ed)
- Explain the difference between a hypothesis, a theory and a law as they are used in science (Gen Ed)
- Learning Activities to support general education outcomes: Lab experiments, videos and in-class demonstrations. Assessment Methods related to general education outcomes: Laboratory experiments requiring students to draw correct conclusions based on observation and processing of experimental data - documented in a Lab Report

### **Statement of Relation to Curriculum(s):**

Required for Engineering Science major; elective for Mathematics, Chemistry and Biology majors.