

Course Name: PHY-127 General Physics II - Lecture

Date Updated: 2/2022

Credit Hours/week: 3 hrs./wk. – 3 cr.

BEGINNING: SPRING 2022

Catalog Description: This is the second course of a two-semester sequence in general physics. Topics include vibratory and wave motion, electricity, magnetism, optics and essentials of modern physics.

Prerequisite: PHY-125, PHY-126, PHY-128

Text: Curtell & Johnson, Physics, Volume I, Wiley

Curtell & Johnson, Physics, Volume II, Wiley

Curtell & Johnson, Physics Student Solutions Manual, Wiley

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

Syllabus:

Topics
Springs and Hooke's law; restorative forces in spring-mass systems
Simple harmonic motion
Natural frequency of spring-mass system and pendulum
Nature of waves; speed of propagation; periodic waves
Sound intensity; the Doppler effect
Superposition, interference; transverse standing waves
Charged particles; charged objects; attraction/repulsion of charged particles; conductors/insulators; charging by contact and induction
Coulomb's law; electric field at a point
Electric field lines; field inside a conductor
Electric potential; potential difference
Equipotential surfaces; potential gradient
EMF and current; Ohm's law; Kirchhoff's rules
Parallel and series equivalences for resistors; internal resistance
Electric power; alternating current
Magnetism; magnetic force on moving charge
Motion of charge in magnetic field; mass spectrometer
Magnetic force on current-carrying wire; torque on current-carrying loop
Examples: galvanometer, dc motor; magnetic field caused by current carrying wire
Magnetic field caused by loops, coils
Induction of EMF in straight conductor by magnetic field; mechanical force required to induce EMF; conservation of energy
Light rays; reflection of light; formation of images by plane mirrors; spherical mirror parameters
Images formed by spherical mirrors; the mirror and magnification equations

Refraction of light; Snell's law; total internal reflection
Lenses; formation of images by lenses, thin-lens and magnification equations
Blackbody radiation; Planck's constant; planetary model of the atom; line spectrum of hydrogen; Bohr model of the atom; Bohr radii
Energy levels in the Bohr model; Bohr model explanation of line spectrum of hydrogen; x-rays

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

- Describe simple Harmonic motion
- Describe the Doppler effect
- Apply concepts learned in class to solve problems involving spring-mass systems
- Apply concepts learned in class to solve problems involving electricity, magnetism and fields
- Organize, analyze, synthesize and evaluate experimental data
- Evaluate and draw conclusions from numerical data and graphical information
- 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 for Gen Ed: Lectures, demonstrations and in-class activities Assessment Methods for Gen Ed: Exam questions that test a student's understanding of the presented material.

Statement of Relation to Curriculum(s);

A General Education Science Required by no program of study; elective for students in the science and mathematics programs (chemistry, biology, mathematics, and mathematics/science options)