Catalog Description: Three hours lecture, three hours lab per week. Prerequisites: Completion of MAC 1140 and MAC 1114, MAC 2147, or MTB 132, MAC 1105, and PHY 2053C with a grade of “C” or better. This course meets Area V requirements for the A.A./A.A.S./A.S. general education requirements. This course is a comprehensive non-calculus study of fundamental concepts of natural laws, especially as they apply to optics, electricity, magnetism and modern physics. Additional special fees are required. Students already with credit for PHY 2049C cannot subsequently get credit for PHY 2054C.

Performance Standards:

At the successful completion of this course, the student should be able to:

1. Calculate electric forces, fields and potentials of point charges.
2. Solve the equations of basic DC circuits which include resistors, voltage sources, capacitors, and inductors, and determine unknown currents in any of the circuit components through the use of linear algebra.
3. Set up simple DC circuits in the laboratory and use measuring devices in order to find voltages and currents in circuit elements.
4. Write the mathematical expression of a periodic wave traveling in one dimension, and apply it to examples involving sound and light.
5. Describe constructive and destructive interference, and explain its applications in optics.
6. Apply reflection Law to concave, convex and plane mirrors. Calculate the image position and size if the object position and size are given.
7. Apply the refraction Law to calculate the light travel in mediums.
8. Apply the lens equation and ray-diagram method to find image position and size in a thin-lens system.
9. Find focal lengths and images in the laboratory setting of thin-lens system.
10. Describe the structure of the atom.
11. Apply the radiation theory and its equations in calculation of nuclear material of radioactivity.
12. Explain the scientific method and the importance of verifying theoretical principles in the laboratory.
13. Acquire data in the laboratory, including the use of measuring equipment, the rounding of numbers and the calculation of errors and standard deviations.