I. Course Prefix and Number: PHY 119
   Course Name: College Physics II
   Credit Hours and Contact Hours: 4 Credit Hours - 6 Contact Hours

Catalog Description:
Second semester of a two-course sequence suitable for transfer students seeking a laboratory science elective, life science students and those in the engineering technologies. This course is at the mathematical level of intermediate algebra and trigonometry. Topics include; waves, electromagnetism and optics.
Prerequisites: PHY 118 with a C or better and MAT 145 with a C or better or placement into Math Level 3 or higher.

II. Course Outcomes and Objectives

Student Learning Outcomes:

Upon completion of the course the participant will be able to:
1. Find solutions to applied problems using numerical, graphical, vectors, algebraic, trigonometric techniques.
2. Explain basic physics concepts and how they relate to everyday experiences.
3. Demonstrate proficiency in problem solving methodology and critical thinking skills.
4. Relate mathematics to physical reality and vice versa.
5. Estimate margins of errors in measurements and calculations.
6. Explain and demonstrate how scientists use the scientific method to explore physical phenomena. The scientific method includes: observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of mathematical and interpretive analysis.
7. Apply scientific data, concepts, and models in problem solving to waves, electricity, magnetism and optics.
8. Work effectively with others in teams.
9. Access information for life-long learning. (This includes use of the text books, libraries, and the Internet)
10. Assess limitations of what they know, and know how to seek further knowledge pertinent to the subject matter.
11. Model problems appropriate for the given situation and criteria, and assess their performance.

Relationship to Academic Programs and Curriculum:

This course is a college level course that fulfills elective mathematics/science course requirements for all A.A., AS., and A.A.S. degree programs. Each student should verify the appropriateness of this course for his/her program with his/her advisor.

College Learning Outcomes Addressed by the Course:

☐ writing ☐ ethics/values
III. Instructional Materials and Methods

Types of Course Materials:
- Textbook: Selected by department.
- Scientific Calculator: Specified by instructor.
- Supplementary material: Specified by instructor.

Methods of Instruction
1. Lecture
2. Discussion
3. Demonstration
4. Group activities
5. Laboratories

IV. Assessment Measures

Student Learning Outcomes will be assessed through a variety of activities. The Science/Technology department believes that each instructor should determine the grading system and evaluation methods that will be used in their sections of the course. Any grading system used in the course must be consistent with the College Catalog. These methods must be communicated to students the first week of the semester in writing. Possible evaluation methods include quizzes, tests, laboratory reports, collected assignments, group activities, et. al. Such evaluations and related assignments will develop a student’s ability to read problems carefully, perform mathematics and use problem-solving techniques. Course policies with respect to attendance, late work, plagiarism, etc. must be communicated to the student.

V. General Outline of Topics Covered:
The course is divided into units organized around the following concepts.

I. OSCILLATIONS AND WAVES
   1. Oscillations
   2. Traveling Waves and Sound
   3. Superposition and Standing Waves

II. OPTICS
   1. Wave Optics
   2. Ray Optics
   3. Optical Instruments

III. ELECTRICITY AND MAGNETISM
1. Electric Fields and Forces
2. Electrical Potential
3. Current and Resistance
4. Circuits
5. Magnetic Fields and Forces
6. Electromagnetic Induction and Electromagnetic Waves
7. AC Electricity

IV. Fluids and Thermal Properties of Matter (selective topics)