SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: PHYS 230 Department: Physics

Course Title: College Physics 2 Semester: Spring Year: 1997

Objectives/Competencies

Course Objective	Competencies
1. Process Objectives. The process objective of this course is to have students be able to use the mathematics of physics to solve hypothetical problems presented in text form, and to model phenomena measured in laboratory. The topics and competencies required to meet this objective are listed on the right under "Competencies." These topics are described in detail in standard physics texts. Second course in series of two semesters. Follows MP 130: College Physics 1.	1. Physics Process Competencies. At the end of this course, students will be able to use the mathematics of physics to solve hypothetical problems presented in text form, and to model phenomena measured in laboratory. Mathematical models of the physical world are listed below: a. Wave (physical) optics b. Lenses and ray tracing c. Ohm's law d. Kirchhoff's laws e. A.C. Circuits f. Elements of solid-state physics g. Coulomb's law h. Gauss's law i. Magnetism j. Ampere's law k. Biot-Savart law l. Faraday's law

Course Objective	Competencies
	m. Maxwell's Equations n. Planck quantization, photoelectric effect o. Bohr Atom
2. Computational Tools for meeting Objectives. Physics students usually need some skill using computational tools like calculators and computers. This course assumes that students can use computational tools effectively when they ENTER the course so they can meet the physics course objectives outlined here.	1. Computational Tools. This course assumes that students can use the following tools effectively when they ENTER this physics course. a. Scientific Calculator, trigonometric functions
3. Mathematics. Physics courses often teach similar subject matter at different levels of sophistication. These levels are most clearly identified by the levels of mathematics used in particular courses. There are two important considerations concerning mathematics; the level of mathematical competency upon entering a physics course, and the mathematical competency added during the course.	1. Mathematics Competencies on Entry. In this physics course, students are presumed to be fluent in mathematics at the level of: a. Can use scientific calculator b. Algebra; equations, linear graphing c. Trigonometry; sine, cosine and tangent
Mathematics Objectives. An objective of this course is to have students be able to apply several standard mathematical techniques in the solution of physics problems. These competencies are listed on the right under "Competencies."	Mathematics Competencies. At the end of this course students will be able to use several standard mathematical techniques. These topics are described in detail in standard mathematics texts. a. Evaluate an equation by replacing the variables with numbers. b. Solve equations in one unknown by applying the rules of algebra.

Course Objective	Competencies
	c. Use the equation for a straight line. d. Solve quadratic equations. e. Solve simultaneous equations. f. Use the trigonometry of right triangles appropriately.
4. Laboratory Objectives. The objective of the laboratory is to give students hands-on experience with laws of nature and conventions of physics. The laboratory experience emphasizes measurement and mathematical modeling. The topics in physics covered in the laboratory generally support topics emphasized in class.	1. Laboratory Competencies. At the end of the laboratory portion of this course, students will be able to: a. Follow instructions for laboratory procedures. b. Make measurements and collect data. c. Organize and present data as tables and graphs. d. Interpret graphs and statistical data. e. Evaluate decay (or growth) curves. f. Plot data on linear graph paper. g. Mark error bars on graphs of measured data. h. Relate experimental data to mathematical models. i. Work in teams. j. Prepare a Lab Report. k. Meet deadlines.