SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: PHYS 125 Department: Physics

Course Title: Physical Science Semester: Spring Year: 1997

Objectives/Competencies

Course Objective	Competencies
1. Process Objectives. The process objective of this course is to have students 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 side under "Competencies." These topics are described in detail in standard physics texts. One semester course that satisfies college laboratory requirement.	1. Physics Process Competencies. At the end of this course, students will be able to solve hypothetical problems presented in text form, and to model phenomena measured in laboratory. Models of the physical world are listed below: a. Conditions of static equilibrium b. Vectors to describe force and motion c. Projectile motion d. Circular motion; centripetal acceleration e. Newton's laws of motion f. Definition of work g. Power h. Kinetic energy and gravitational potential energy i. Work - Energy theorem j. Conservation of energy k. Newton's law of gravitation l. Linear momentum m. Angular momentum

Course Objective	Competencies
	n. The conservation of momentum o. Torque p. Temperature, heat, and heat transfer q. Change of state r. Gas laws s. Fluids at rest and in motion t. Simple harmonic motion; harmonic oscillator u. Fundamentals of wave motion v. Sound w. Lenses and ray tracing x. Ohm's law
2. Knowledge Objectives. The knowledge objective of this course is to have students be able to use scientific terminology necessary for solving hypothetical problems presented in text form, and explaining phenomena observed in laboratory. The knowledge required to meet these objectives is listed on the right under "Competencies."	1. Physics Knowledge Competencies. At the end of this course, students will be able to use scientific terminology necessary for solving hypothetical problems presented in text form, and explaining phenomena observed in laboratory. Systems describing phenomena of the physical world are listed below. Standard physics texts explore these ideas in detail. a. A.C. Circuits b. Faraday's law c. Radioactive decay d. Chemical Reactions (equations) e. Bohr Atom f. Radioactive decay, fission g. Composition of nuclei h. Spectra, x-ray, gamma ray, and composite i. Chemical Elements

Course Objective	Competencies
	j. Chemical Bonding k. Atmosphere and climate l. Classification of Minerals m. Geologic structure n. Geologic time o. Solar System (structure and components) p. Universe (structure)
3. 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. No computational skill is required.
4. 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. Arithmetic; decimals and fractions
5. 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	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.

Course Objective	Competencies
emphasizes measurement and mathematical modeling. The topics in physics covered in the laboratory generally support topics emphasized in class.	d. Plot data on linear graph paper. e. Work in teams. f. Prepare a Lab Report. g. Meet deadlines.