COURSE SYLLABUS

Tunxis Community College

Education That Works For a Lifetime

Course Title:	General Physics I	**Date submitted:**	November 2017 (17-61)
Department:	Mathematics and Science		
Curriculum:	Physics		

Course Descriptors: Make certain that the course descriptors are consistent with college and Board of Trustees policies, and the current course numbering system.

Course Code: (eg. ACC 101)	PHY*121
Course Type:	X

A: Clinical B: Lab D: Distance Learning
I: Individual/Independent L: Lecture N: M: Seminar Internship
P: Practicum U: Studio
X: Combined Lecture/Lab Y: Combined Lecture/ Clinical/Lab Z: Combined Lecture/Studio

Elective Type:	G/LAS/S

E: English FA: Fine Arts FL: Foreign Language G: General
HI: History HU: Humanities LAS: Liberal Arts & Sciences
M: Math S: Science SS: Social Science

Credit Hours:	4
Developmental: (yes/no)	No
Contact Hours: Lecture:	3
Clinical:	0
Lab:	3
Studio	0
Other:	0
TOTAL:	6
Class Maximum:	20
Semesters Offered:	F

Prerequisites:

C- or better in Intermediate Algebra (MAT*137) or Elementary and Intermediate Algebra Combined (MAT*139). Intermediate Algebra for Liberal Arts (MAT*137L) is NOT sufficient for entry into this course.

Corequisites:

None

Other Requirements:

Scientific calculator, technology skills

Catalog Course Description:

Introductory physics course covering measurements, Newton's laws of motion, gravity, work and energy, momentum, rotational motion, static equilibria, fluids, oscillations, conservation laws, waves, sound, temperature, heat transfer and thermodynamics. This course is the first of a two-semester sequence.

Topical Outline: List course content in outline format.

Lecture:

1. Science and scientific method
2. Measurement, units, accuracy and significant figures
3. Motion, Galileo, Newton and the Laws of Motion
4. Force, energy, work, momentum and conservation laws
5. Statics and equilibria
6. Fluids: pressure and density, static and flow
7. Thermodynamics, heat and temperature, laws and thermodynamic cycles
8. Wave propagation and sound

Laboratory:

1. Experimental uncertainty and data analysis
2. Measurement instruments
3. Uniformly accelerated motion
4. Addition and resolution of vectors
5. Conservation of momentum
6. Projectile motion
7. Work and energy
8. Centripetal force
9. Friction
10. Torque, center of gravity
11. Simple harmonic motion
12. Buoyancy and density
13. Elasticity; Young's Modulus
14. Thermal coefficient of linear expansion
15. Speed of sound

Outcomes:
Describe measurable skills or knowledge that students should be able to demonstrate as evidence that they have mastered the course content.

Upon successful completion of this course, the student will be able to do the following:

1. resolve a system of forces as they relate to the dynamics of motion
2. given a system of forces applied to an object, solve problems pertaining to the displacement, velocity and acceleration of the motion of the object
3. describe Newton's Laws of Motion and apply them in the analyses of problems involving uniformly accelerated motion
4. apply the principles of motion and conduct controlled experiments involving motion along a straight line, motion in a plane, circular motion and simple harmonic motion
5. given the system of forces applied to an object, calculate the work performed and relate this to the energy of the system
6. distinguish between the major types of energy, i.e., potential and kinetic, and relate to the various forms in which energy may manifest itself
7. solve problems on controlled experiments involving conservation of energy, work and momentum
8. apply Pascal's Law and Archimedes' Principle to the solution of problems involving pressure and density of fluids at rest
9. apply Bernoulli's Law to the solution of problems involving fluid flow
10. explain the concepts of temperature and heat as they relate to the mean-molecular kinetic energy and the total-molecular kinetic energy of a substance
11. solve problems dealing with phase changes, heat transfer and expansion properties of common substances
12. explain the conservation of energy in terms of the First Law of Thermodynamics, and conditions and restrictions imposed by the Second Law of Thermodynamics
13. calculate the efficiency of thermodynamic heat engines in terms of heat input and work output, and to determine the thermodynamic properties of thermodynamic cycles
14. calculate the speed of sound and wave harmonics in tubes

PROGRAM: *(Numbering reflects Program Outcomes as they appear in the college catalog)*

N/A

COMPETENCY FULFILLED:

Scientific Knowledge & Understanding (SCKX) OR Scientific Reasoning (SCRX)

Evaluation: List how the above outcomes will be assessed.	**Assessment will be based on some or all of the following criteria:** Quizzes Examinations Laboratory reports
Instructional Resources: List library (e.g. books, journals, on-line resources), technological (e.g. Smartboard, software), and other resources (e.g. equipment, supplies, facilities) required and desired to teach this course.	**Required:** Scientific calculator, physics software, physics laboratory **Desired:**
Textbook(s)	*Physics*, 6th ed.; Giancoli, Pearson Education *Physics Laboratory Experiments*, 6th ed.; Wilson, Houghton Mifflin