Date: Spring 2011

I. Course Prefix and Number: PHY 151
   Course Name: General Physics I
   Credit Hours and Contact Hours: 4 Credit Hours - 6 Contact Hours

Catalog Description:
First semester of a two-course sequence suitable for transfer students pursuing degrees in engineering, computer science, professional programs which require calculus based physics. Topics include motion in one and two dimensions, force laws, energy, momentum, conservation principles, gravity, and rotational motion. PHY 101 or high school Physics with a C or better is strongly recommended. Prerequisites: MAT 271 with a C or better.

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, and calculus.
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.
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:
The primary audience for this course is students pursuing A.S. degree in Engineering Science and other transfer programs which require calculus-based physics course. It also fulfills elective mathematics/science course requirements for all A.A. A.S., and A.A.S. degree programs. A student should verify the appropriateness of this course for her / his program with her / his advisor.

College Learning Outcomes Addressed by the Course:
- [ ] writing
- [ ] ethics/values
- [ ] oral communications
- [x] reading
- [ ] citizenship
- [ ] global concerns
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 Newton's Laws
1. Concepts of Motion
2. Kinematics in One Dimension
3. Vectors and Coordinate Systems
4. Kinematics in Two Dimensions
5. Force and Motion
6. Dynamics I: Motion Along a Line
7. Newton's Third Law
8. Dynamics II: Motion in a Plane

II Conservation Laws
1. Impulse and Momentum
2. Energy
3. Work

III Applications of Newtonian Mechanics
   1. Rotation of a Rigid Body
   2. Newton's Theory of Gravity
   3. Oscillations
   4. Fluids and Elasticity