1. Department, Course Number, and Course Title:

DEPARTMENT OF PHYSICS AND ASTRONOMY

PHYSICS 201 GENERAL PHYSICS (4)

2. Designation:

Required	☑	Elective	☐
Lower Division	☑	Upper Division	☐

3. Course Description: Vectors, mechanics of particles and rigid bodies, basic conservation laws of mechanic

4. Prerequisites: High school physics or permission of department; MATH 206 (may be taken concurrently).

5. Text and Materials: Physics for Scientist and Engineers, 6th Ed. Serway R., Thomson, 2004
Phys 100/200 Supplement & Notes, Carr
Phys 201 Lab Manual

6. Course Objectives: Students will be exposed to a first course in Newtonian Mechanics using differential calculus. They will see how the application of Newton's Laws of Motion and the Conservation of Momentum and Mechanical Momentum can yield solutions to complex 1, 2, and 3 dimensional motion, including rotations and problems in elementary Static Equilibrium and Elasticity.

Course Outcomes

- Students will come to appreciate the scalar and vector nature of physical quantities.
- Students will learn to identify and quantify forces which govern dynamics of particle motion.
- Students will learn how to use the concepts of work, kinetic energy, and potential energy in quantitative descriptions of dynamics.
- Students will learn how to employ conservation laws to simplify and to understand motion.
- Students will learn how to use rotational kinematics and dynamics for complex rigid body motion.

7. Topics Covered: (in Order of Presentation)

- Units, dimensional analysis (Ch. 1)
- Kinematics in one dimension (Ch. 2)
- Vector and scalar quantities (Ch. 3)
- Motion in two dimensions (Ch. 4)
- Newton's Laws of Motion (Ch. 5)
- Rotational kinematics (Ch. 6)
- Kinetic energy and work (Ch. 7)
- Potential energy and conservation of energy (Ch. 8)
- Linear momentum, conservation of linear momentum, center of mass motion (Ch. 9)
- Rotational dynamics, rotational energy, torque (Ch. 10)
- Angular momentum, conservation of angular momentum, rolling motion (Ch. 11)
- Equilibrium of rigid bodies, center of gravity, elastic properties of solids (Ch. 12)

8. Class Schedule:

Number of Sessions per week:	2 lectures; 1 recitation; 1 laboratory	
Duration of each session:	Lecture	1 hr, 15 min
	Recitation	50 minutes
	Laboratory	2 hours, 30 min

9. Contribution of course to meeting the professional component:

This course is part of the one year (48 quarter units) of Basic Mathematics and Science.

Science	4 units

10. Relationship of course to program objectives:

This course relates to the program objectives by contributing to the following measurable outcomes at the level indicated for all engineering graduates:

Knowledge outcomes:

- an ability to apply knowledge of mathematics, science, and engineering (abet a)
- knowledge of current events and societal contemporary issues -- non-engineering related. (abet j)
- knowledge of measurement techniques

Skill outcomes:

- an ability to design and conduct experiments as well as to analyze and interpret data (abet b)
- an ability to communicate effectively (abet g)
- an ability to think in a logical sequential process

Attitudes Outcome:

- a desire to be a flexible and adaptable team player (collaborative attitude)

11. Prepared by:	Konrad A. Aniol	01/2000
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