Physics 114: General Physics (1 of 3)

Overview

Phys 114 is the first of a three-quarter sequence of introductory physics courses targeted for students in life sciences. Upon successful completion of this course, a student will be able to develop algebra-based models to describe the physical world pertaining to motion, dynamics, momentum, and energy, and apply them to other fields of science and everyday phenomena.

The course consists of lecture (3 per week) and tutorial (Tuesday from 5pm to 6pm) components.

Evaluation

The final course grade is based on one of the following grade weightings. The exams are curved, but all other aspects of the course are graded on an absolute scale. The average grade in the course will be set to around 2.8, with top 5 to 10 % of students getting a grade point of 3.9 or 4.0.

- **60 %:** Closed-book exams: two midterms and one final exam. A better option is chosen from the two below.
    1. 40 % midterms and 20 % final
    2. 20 % midterm (better of 2) and 40 % final
- **25 %:** Pre-lecture quizzes before each lecture
- **10 %:** In-class quizzes during lectures
- **5 %:** Tutorial pre-tests before tutorials
- Practice problems are assigned but not graded.

Texts

- **Required:** *College Physics a strategic approach*, Knight Field Jones (Pearson, *3rd edition technology update*, 2017)

Lecture Topics (Textbook chapters)

- **Handouts:** Scaling
- **Ch. 1 (1 lecture):** Representation of motion
- **Ch. 2 (3 lectures)** One dimensional kinematics
- **Ch. 3 (2 lectures)**: Vectors and two dimensional motion
- **Ch. 4 (2 lectures):** Forces and Newton's laws of motion
- **Ch. 5 (4 lectures):** Applications of Newton's laws
- **Ch. 6 (1 lecture):** Circular motion
- **Ch. 7 (4 lectures):** Torque, rotational dynamics, and center of gravity
- **Ch. 8 (3 lectures):** Static equilibrium and elasticity
- **Ch. 9 (2 lectures):** Impulse and momentum

- **Ch. 10 (5 lectures):** Energy, work, and power
- **Ch. 11.1 & 11.2 (1 lecture):** Energy in the body

Tutorial Topics (7 or 8 of the following)

- Scaling
- Representation of motion
- Acceleration in one-dimension
- Newton's second and third laws
- Rotational motion
- Biomechanical torque
- Equilibrium of rigid bodies
- Conservation of momentum
- Work and changes in kinetic energy
- Conservation of energy