

# Physics 115: General Physics (2 of 3)

## Overview

Phys 115 is the second 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 thermodynamics, fluids, electricity and magnetism, 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 2.9, 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, 3<sup>rd</sup> edition technology update, 2017)

## Lecture Topics (Textbook chapters)

- **Ch. 11 (3 lectures):** First and second laws of thermodynamics
- **Ch. 12 (5 lectures)** Ideal gas law, thermal expansion, calorimetry, and heat transfer
- **Ch. 13 (4 lectures):** Pressure, buoyancy, fluid dynamics, and viscosity
- **Ch. 20 (3 lectures):** Electric fields and forces
- **Ch. 21 (4 lectures):** Electrical potential and capacitors
- **Ch. 22 (1 lecture):** Current and resistance, Ohm's law
- **Ch. 23 (3 lectures):** Parallel and series circuits, Kirchhoff's laws, RC circuits
- **Ch. 24 (2 lectures):** Magnetic fields and forces
- **Ch. 25 (2 lectures):** Electromagnetic induction

### **Tutorial Topics (7 or 8 of the following)**

- First law of thermodynamics
- Ideal gas law
- Pressure
- Buoyancy
- Charge
- Electric potential difference
- Capacitance
- Magnets and magnetic forces
- Magnetic interactions
- Lenz' law