

# Physics 106 – Everyday Physics

Ideas are tested by experiment. That is the core of science. Everything else is just bookkeeping.

— Zombified Richard Feynman (according to xkcd).

This course is an introduction to physics using examples drawn from everyday life. The world runs on physics and we will teach you how to see it, appreciate it, and work with it.

The emphasis is on learning by experiment, not by listening to lectures (which will be kept to a minimum). The intended audience is students in the liberal arts who are interested in natural phenomena in the world around us and in the workings of technology.

No prior training in mathematics or the physical science is required, only curiosity and a desire to learn. Using experiments, we will try to understand the physical concepts behind them both qualitatively (what concepts are at work) and, insofar as possible, quantitatively (how they work).

## Instructors

- Markus Wallerberger  
Office: 3240 Randall Lab (office hours by appointment)  
Email: [mwallerb@umich.edu](mailto:mwallerb@umich.edu)
- Chris Dessert (Graduate Student Instructor)  
Email: [dessert@umich.edu](mailto:dessert@umich.edu)

## Requirements

- **Participation** (10% of the grade): this is hands-on class only works if you read the pre-lab part, actually attend each class, actively work together with your peers, and clean up the experiments after the class.
- **Lab handouts** (30% of the grade): for each class, you will be provided a handout that consists of directions for performing the experiment and questions to be answered. Each student is required to provide observations for the experiment and answer questions on their own handout. You are required to hand in your own handout.
- **Homework** (20% of the grade): every Thursday, there will be a short homework, either a general question about experimental science or a extension of the experiment you performed in class.

- **Midterm exam** and **final exam** (each 20% of the grade): There will be one midterm exam and one final exam that covers the experiments performed in class: physics concepts and experimental methods.

## Attendance

Attendance and participation in all classes is **mandatory**. Exceptions will be made for important reasons only (such as official university business, medical contingencies, or a family emergency). Please talk to us as soon as something comes up. Makeup work for excused absences will be arranged on a case-by-case basis.

## Submissions

Homeworks and lab exercises are due at the beginning of the lab one week after they were set. For late submissions, 20% of the points of the assignment are taken away per day of it being overdue.

## Lab etiquette

Please no eating, drinking, or smoking inside of the lab. Please reserve some time at the end of the lab to put back the items you took and clean up after you.

## Tentative schedule

A tentative schedule can be found on the right.

| Date    | Topic                   |
|---------|-------------------------|
| Sep. 06 | Measurements            |
| Sep. 11 | Time                    |
| Sep. 13 | Mass and Weight         |
| Sep. 18 | Bouyancy                |
| Sep. 20 | Fluids                  |
| Sep. 25 | Solids                  |
| Sep. 27 | Phases of Matter        |
| Oct. 02 | Electricity             |
| Oct. 04 | Batteries               |
| Oct. 09 | Circuits I              |
| Oct. 11 | Circuits II             |
| Oct. 16 | No class -- Study break |
| Oct. 18 | Ohm's Law               |
| Oct. 23 | Work and Energy         |
| Oct. 25 | Exam Review             |
| Oct. 30 | Midterm exam (in class) |
| Nov. 01 | Capacitors              |
| Nov. 06 | Energy and Lighting     |
| Nov. 08 | Home Wiring I           |
| Nov. 13 | Home Wiring II          |
| Nov. 15 | Magnets and Magnetism   |
| Nov. 20 | Motors/Generators       |
| Nov. 22 | No class - Thanksgiving |
| Nov. 27 | Rock Band I:            |
| Nov. 29 | Rock Band II:           |
| Dec. 04 | Light and Optics        |
| Dec. 06 | Atoms and Nuclei I      |
| Dec. 11 | Atoms and Nuclei II     |