

## Physics 1 Fall/Spring Syllabus

Instructor: Dr. Johnson

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### Textbook: OpenStax College Physics

This textbook can be obtained free online from [openstax.org](https://openstax.org). The physics is algebra-based and the book is relatively straightforward and accessible to high school and middle school students.

### Material Covered

This course covers one-dimensional kinematics, two-dimensional kinematics, and forces, as well as the necessary trigonometry skills.

### Class Structure

The first part of the class is spent reviewing the previous day's homework, and quiz or exam. Next, new material is covered. And finally, a comprehensive quiz is given. On exam days, we will review the course material up to that point, and discuss an interesting modern physics topic before the exam.

### Schedule

**Wk 1: Introduction, Displacement, Velocity, Acceleration, Vectors**

Lecture, in-class problems, quiz

HW: Read Ch. 1 (quickly), Ch. 2.1-2.4 (carefully), Handout

**Wk 2: One-Dimensional Kinematic Equations**

Lecture, in-class problems, comprehensive quiz

HW: Ch. 2.5, 2.6, 2.7, Handout

**Wk 3: Gravity, Graphs of Motion**

Lecture, in-class problems, comprehensive quiz

HW: Ch. 2.8, 2.9, Handout

**Wk 4: Two Dimensional Kinematic Equations**

Lecture, in-class problems, comprehensive quiz

HW: Ch. 3.1, 3.2, 3.3, Handout

**Wk 5: Projectile Motion, Relative Motion, Review**

Lecture, in-class problems, comprehensive quiz

HW: Ch. 3.4, 3.5, Handout

**Wk 6: Review, Modern Physics Topic, Exam**

Review, Interesting physics topic, Exam

**Wk 7: Newton's First and Second Laws, Free-body Diagrams**

Lecture, in-class problems, comprehensive quiz

HW: 4.1, 4.2, 4.3, Handout

**Wk 8: Newton's Third Law, Normal Forces, Tension**

Lecture, in-class problems, comprehensive quiz

HW: 4.4, 4.5, 4.6, Handout

**Wk 9: The Fundamental Forces, Friction**

Lecture, in-class problems, comprehensive quiz

HW: 4.7, 4.8, 5.1, Handout

**Wk 10: Drag, Elasticity**

Lecture, in-class problems, comprehensive quiz

HW: 5.2, 5.3, Handout

**Wk 11: Uniform Circular Motion, Centripetal Acceleration and Force**

Lecture, in-class problems, review, comprehensive quiz

HW 6.1, 6.2, 6.3, Review Handout

**wk 12: Review, Modern Physics Topic, Final Exam**

Review, Interesting physics topic, Exam

- Do the reading and the homework. I will go over the material in class beforehand. Physics, like mathematics, is comprehensive. If you don't understand an important concept, you won't be able to learn future material that builds on it.
- Do all examples in the reading. Try to work them out without looking at the answer. This is a good way to judge whether you truly understand the concepts.
- Do the homework and make note of particularly difficult or confusing problems. I can spend extra time going over those problems.
- Solve problems carefully. You might be tempted to skip steps or plug in numbers early to save time. Resist these urges. Solve the problem to the end before plugging in any numbers, that way you can find mistakes without having to solve the entire problem again from scratch.
- In this course, I will teach you how to solve all the problems using systematic methods. But, often physics problems can be solved in clever, faster ways. Physics III focuses on teaching quick and clever solutions to problems, but you are encouraged to watch for them now.