Physics II Syllabus
Grade 12

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Course Overview

Welcome to Physics II! This year we will lay the foundation for you to understand more deeply the structure of matter from solids, liquids, and gases down to atoms and atomic nuclei. You will also learn how electric and magnetic fields behave and are used to operate electric circuits and to generate electric power. And then there is optics, how light can be controlled by mirrors and lenses to create images. An understanding of the material in this course will benefit you in college and beyond. Even better, the physics you learn this year will spark your imagination to envision things in the natural world that might not have entered your mind until now. While the journey requires the hard work of reasoning, I hope you will enjoy the adventure as we explore some beautiful and powerful ideas in physics.

Course Objectives

- Continue to develop a sense of wonder about the natural world.
- Become proficient in the methods of scientific inquiry and develop laboratory skills.
- Conceive and understand basic models in physics.
- Develop the ability to describe and explain physical systems and processes with mathematics.
- Develop problem-solving skills.
- Develop the ability to communicate with others using the terminology of physics.

Class Materials

- Access to computer and printer
- Spreadsheet software (e.g. Excel, Numbers, Google Sheets)
- Scientific calculator

Course Materials

- **College Physics: Principles and Applications**, 6th Edition, Douglas Giancoli (provided by SPA)

Course Expectations

- **Homework:** Homework is assigned nearly every class period. It most often consists of reading a few sections from the textbook and doing a few problems. Homework should be done neatly and thoughtfully. It is to be completed by the beginning of the class period of the assigned date.

- **Class Participation:** Students have many ways to participate effectively. Here are some of them: asking questions to clarify an idea or discussion, answering the questions of other students, recording insights and ideas related to our work, designing an experiment, operating lab equipment, collecting and analyzing data, reporting one's own questions and science experiences outside of class, proposing ideas that can enhance Physics II

Tutoring Hours

Lyceum (8:40 am – 9:00 am) on Mondays and Thursdays or by appointment in Room 201

Assignments and Assessments

- **Participation**
  Some of the ways to participate are listed above. Your active participation contributes to your grade.

- **Quizzes: Two kinds for two purposes**
  Quizzes can be *formative* and weighted as Homework for grading purposes, and they can be *summative* and weighted as Quizzes and Tests. Formative quizzes are designed to provide you feedback about how your learning is going during a course of instruction. They may be given without notice. Likely points of difficulty are probed to see if specific, basic ideas have been understood. Summative quizzes, on the other hand, are like short tests; they are designed to test your understanding *after* a course of instruction has been completed and will be advertised in advance.

- **Tests**
  Each unit of instruction ends with a test. Usually the units of instruction are the chapters in the book. The tests usually include multiple-choice items and free response questions that provide an opportunity for you to use the ideas you have learned. There are also often test questions related to the experiments that we have done.

- **Projects/Labs**
  We will learn to write simple computer programs for physics. Some programming will be done in class, and some will be done outside of class. These programs will emphasize computer modeling of physical systems and are designed to help you understand how computer models can be made and used. Computer modeling is an important skill that is playing an increasingly critical role in all sciences. We will teach you the techniques you will need; no previous programming experience is assumed. Your programs will be graded as homework.

  Laboratory experiments will be a regular feature in our work. We will often use student laptop computers to collect data. We will provide the data collection software at no cost to students with laptops.

Turning in Assignments

Assignments are collected at the beginning of class. Computer programs are turned in by emailing me a link to your work, which will be on the web.

Late Assignment Policy

Assignments turned in one-day late receive half credit. Assignments are not accepted if they are more than one day late.

Course Grading

Course Work	Percentage
Participation	10%
Tests and Quizzes	50%
Lab Work	25%
Homework	15%
TOTAL	**100%**

Academic Policies and Institutional Resources

All student work (tests, quizzes, homework, projects) will be returned within one week of submission, with minor exceptions. Essays will be returned within two weeks of submission. Please refer to Scottsdale Prep's Family Handbook pp. 26-38 for more information on the academy's policies.

Science Safety Rules & Parent/Student Safety Contract

Science class is an enjoyable and exciting place to learn. You are responsible for your safety and the safety of your classmates. The following are safety rules to help guide you in protecting yourself and others from injury.

1. Read all instructions before you begin.
2. Take note of every verbal or written caution given for an experiment and be fully prepared to comply with each one.
3. Do not attempt any unauthorized experiment.
4. Never engage in horseplay or practical jokes of any kind during an experiment.
5. Know the location & use of the extinguisher, eyewash, and other safety equipment.
6. Report any accident, injury, spill or incorrect procedure to your instructor at once.
7. Use safety equipment provided for you. (goggles, aprons, gloves)
8. Long hair should be tied back. Avoid hanging necklaces or bulky jewelry.
9. Only teacher approved materials are permitted in the working area.
10. Never eat or drink during the experiment. Never inhale chemicals. Do not taste any substance or draw any material into a tube with your mouth.
11. Handle lab equipment properly. Get help if you do not know how to use something.
12. Do not use chipped, cracked or dirty glassware.
13. After the experiment, clean equipment and return all materials and supplies to their proper places. Clean your area with water. Wash your hands.

STUDENT CONTRACT:

I,_____, have read the above safety rules and have had the rules explained to me. I understand these guidelines are for my own safety. I will follow these rules when participating in lab activities. I understand that my failure to follow these rules and procedures could result in a hazardous situation for me or for other class members. I realize that my failure to follow these rules and procedures will result in some or all of the following actions:

a. a verbal warning from my teacher
b. a zero on the lab activity
c. notification of my parents/guardian
e. suspension from future labs
d. removal from the lab activity
f. further disciplinary action

_____ _____

Student signature Date

PARENT CONTRACT:

I, _____am the parent/guardian of_____.

I have read the above safety items and understand them. I recognize the need for safe behavior by my child in the science lab, and support these policies. I have read the consequences for failure to comply with proper procedures/rules, and I agree that a safe environment is necessary to conduct science activities.

_____ _____

Parent signature

<u>Students</u>: please return this page to Mr. Swackhamer by Friday, August 9.

I have read and understood all the contents of the Physics II syllabus and I agree to abide by the policies and procedures described within.

_____
Student's name (print)

_____ _____
Student's signature Date

_____ _____
Parent's name (print) Parent's e-mail

_____ _____
Parent's signature Date