

Classical High School

Physics

Syllabus

Instructor: Mr. Butler

Text: Physics Author: Raymond A. Serway

Prerequisite: Completion of Algebra II

Required Materials: Scientific Calculator, Slot Folder, Problem Notebook, Pencils.

Website: **Physica.cloud** The student should visit the website daily to view updates and to access and utilize required topic resource materials!

Course Description: General Physics in an introductory, non-calculus based course designed to introduce students to fundamental physics concepts. Algebra, analytic geometry, and trigonometry are widely used and provide the mathematical foundation for the application of the physics principles.

Major topics include:

- The Science of Physics
- One-dimensional and two-dimensional kinematics
- Forces and Newton's laws of motion
- Work and energy
- Circular motion, gravitation and Kepler's laws of planetary motion
- Impulse and momentum
- Wave phenomena
- Electrostatics
- Nuclear physics

In addition to classroom lectures and presentations, instructor demonstrations, films, internet applets, and student hands-on and virtual laboratory experiences are incorporated and serve to support and enhance the physics principles that are being studied.

Major goals of the general physics course include developing analytical skills and a conceptual framework of physical principles through problem solving and the analysis of a wide variety of physical phenomena. Students learn to classify, interpret, and describe natural phenomena by investigating and relating the physical laws, theories, and principles that have been developed which describe them. An emphasis is placed on the study of basic principles and the unity of these principles within the field of physics.

Evaluation

Quarter:

Tests	60 %
Laboratory	20 %
Mastering Physics	20 %

Midterm:

1 st Quarter	40 %
2 nd Quarter	40 %
Midterm Exam	20 %

Final:

Final Exam	20 %
Midterm Exam	10 %
Quarter Grades	70 %

Homework/Assignments: The student should expect to devote approximately one hour per day working on physics assignments. More time may be necessary when preparing for tests, lab reports or midterm/final exams. Assignments are in the form of textbook readings, questions, problems, worksheets, internet/classroom laboratories and lab reports. Mastering Physics is an online problem-based program that incorporates the application of physics principles by the derivation of problem solutions.

!Late assignments will be subject to grade reduction!

Tests: At least one assessment test will be given for each major unit covered. The tests will focus on assessing student knowledge and understanding of underlying and foundational principles and the application of those principles. Tests typically consist of questions of a conceptual nature given in a multiple choice format and those involving problems solving.

Test retakes are provided as an incentive for students to revisit and re-learn concepts and principles for which their understanding is weak.

Mastering Physics: The Mastering Physics online program will be used to integrate the application of concepts. This provides extensive opportunities for students to deepen understanding of conceptual material being presented in class through the application of principles and techniques by deriving solutions to a variety of problem solving examples of realistic physical phenomena.

Problems and Questions: Physics problems and questions are an important and essential component of the learning experience in physics and provide the student with valuable opportunities to apply the principles covered in class. Successful understanding and application of the physics principles depends to a large extent on the student devoting adequate time solving the assigned problems. A problem set will be assigned for each major topic. Students will work out solutions to each problem or question either through paper/pencil or through the Mastering Physics online program.

Formative Assessments

Formative assessments include focus questions and concept apps. These are integrated into the physics curriculum to monitor student progress and to provide students with the opportunity to check for understanding and to self-assess.

Focus Questions: At the beginning of each class a question will be posed to check for understanding and activate prior knowledge and critical thinking. These focus questions involve material related to current concepts or upcoming topics and serve as quiz-type formative assessments to help students gauge their own level of understanding.

Concept Apps: To deepen understanding, each topic covered will include resources that supplement the textbook readings and provide additional opportunities for the student to apply the physical principles they are learning. Class time is often made available for students to work on these activities in cooperative learning groups. Solutions to the concept apps are provided for students to self-assess and gauge their level of understanding.

Labs/Lab Reports: Typically one laboratory experiment will be conducted for each major topic covered. Lab experiences include both hands-on and virtual. Pre-lab sessions will highlight the purpose, objectives, procedure, apparatus, and specific measurements to be made provide an overview of the principles being investigated. It is the student's responsibility to read the lab and become familiar with its content; purpose, procedure, specific measurements, analysis of data, and questions. Students will conduct each lab as a team and work jointly to produce one lab report. A lab report format and rubric are used to offer guidance in writing the report and to assess and assign a grade.

Absences: Due to the amount of material and the pace with which it is covered, students who are absent can quickly fall behind. The student is responsible for any assignments missed/owed during an absence. On the day the student returns from an absence, he/she is expected to see the instructor to get any assignments missed during the absence or to turn in any assignments that were due during the absence.

Make-Up Policy

Tests: Students who are absent for a test must be prepared to take an alternate version on the day they return to school, provided the absence is excused. No test make up is allowed for an unexcused absence and will result in a zero grade.

Labs: Due to the time involved in lab preparation, setup, and break-down, a lab make-up may not always be possible. In this case, an alternate assignment related to the lab topic will be assigned.

Student Work:

Save all work! This includes tests, lab reports, and concept apps. If the case arises in which a grade is in question, the responsibility for proof of grade is yours!

Classroom Policies

1. Be On Time. If you are late for class, you will be expected to stay for detention.
2. Come to class everyday with your textbook/materials and prepared to learn.
3. Absolutely **NO cell phones**, music devices, or food are allowed in class.
4. Be academically responsible: Study daily and complete homework.
5. At all times, conduct yourself with a behavior based upon general rules of politeness, consideration, and respect.

!Class Participation is Necessary for Learning Success!

Participating includes:

- ✓ completing homework assignments
- ✓ arriving to class on time and prepared to learn
- ✓ following posted class policies and expectations
- ✓ staying engaged during class; using class time effectively
- ✓ working to keep pace with topics and class activities; being self-directed
- ✓ being attentive and interactive during presentations and discussions
- ✓ always having required course materials
- ✓ consistently staying focused and on task with class-work assignments
- ✓ showing respect and courtesy toward teacher and fellow students
- ✓ contributing useful ideas and supporting the efforts of others when working in cooperative groups