

Naperville North High School AP Physics 2 Syllabus 2023/2024



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District Mission

To educate students to be self-directed learners, collaborative workers, complex thinkers, quality producers, and community contributors.

Department Mission

At Naperville North High School, our mission is to provide high-quality, innovative, and engaging science education that fosters deep understanding, critical thinking, and a lifelong passion for scientific inquiry. Grounded in the Next Generation Science Standards (NGSS), our curriculum and teaching approach empower students to develop the knowledge, skills, and attitudes necessary to thrive in a rapidly changing world. We are dedicated to nurturing curiosity, collaboration, and scientific literacy, preparing our students to become informed citizens who can contribute to solving local and global challenges through the application of scientific principles.

Course Description

The purpose of this course is to contribute to the achievement of the District's Mission, which is to educate students to be self-directed learners, collaborative workers, complex thinkers, quality producers and community contributors; and to master the learning that comprises this physics course. To achieve this, you will develop a conceptual understanding of our physical world. You will learn how to think critically, solve challenging problems, and reflect on your understandings. Through this process you will become better prepared for the structure of college classes and the expectations placed on professionals in the workplace. This is a demanding course designed for college-bound students interested in science and, potentially but not necessarily, planning a career in science or engineering. We use a college e-text, but move at a slower pace than a college course. This course is the equivalent of a one-semester college algebra-based physics course. You will be well prepared for the AP Physics 2 exam. However, this course often explores topics beyond the AP Physics 2 curriculum. You will learn through a combination of self-study, and classroom collaboration.

Course Textbook & Resources

College Physics: A Strategic Approach - AP Edition, 3rd edition; Knight, Jones & Field
Mastering Physics
AP Classroom
Pivot Interactives

Course Standards & Weights

The units and lab portfolio are weighted to comprise the overall coursework grade:

Fall: Special Relativity: 4%; Fluid Mechanics: 13%; Thermodynamics: 17%; Electrostatics: 17%; Electric Circuits: 9%; Lab Portfolio: 40%

Spring: Magnetostatics and Electromagnetism: 20%; Geometric and Physical Optics: 20%; Quantum, Atomic, and Nuclear Physics: 20%; Lab Portfolio: 40%

The semester grade is determined by a combination of the coursework grade (85%) and the final exam (15%) (derived primarily from AP sources).

For further course information, you may consult the College Board's AP Physics 2 web-based descriptions.

Units of Study:

Fall Semester Units

- Relativity
- Fluid Mechanics
- Thermodynamics
- Electrostatics
- Electric Circuits



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Grade Calculation Definitions

Spring Semester Units

- Magnetostatics and Electromagnetism
- Geometric and Physical Optics
- Quantum, Atomic, Nuclear Physics
- Particle Physics and Cosmology (if time)

Students will be provided with multiple and varied opportunities to demonstrate mastery of learning standards. Although varied in content, all courses will include examples of practice and evidence of learning:

- **Evidence of Learning:** Tasks or assessments where feedback is provided to the student and considered evidence of a student's level of proficiency on a given standard or skill. This may include, but is not limited to formative tasks that provide insights on areas for growth as well as summative tests, projects and/or performances. In this course, specific examples include: Unit Exams, Labs
- **Practice:** Tasks that are connected to course standards and learning targets that promote the development of skills and/or knowledge that will be assessed, but where feedback is not provided. This may include, but is not limited to daily readings, note taking, practice exercises and tasks essential to the learning process. In this course, specific examples include: Homework, Quizzes, Lab Activities, Whiteboarding.

Additional Descriptions of Practice and Evidence Activities

You develop understanding of the learning standards for this physics course by completing a variety of learning activities such as *homework, reading, questions, and problems; peer instruction; computational modeling; whiteboarding in groups; quizzes; and lab activities*. While these activities don't always directly affect your grade, they are essential in that they are your opportunity to explore, discover, take risks, make mistakes, ask questions, help each other, practice, and get feedback before having to demonstrate your understanding. You demonstrate your understanding through exams (evidence) at the end of the unit and your lab portfolio throughout the units. Your grade directly reflects your demonstration of your understanding.

Homework Reading, Questions, and Problems. The calendar lists the reading, questions, and problems to be completed as homework as needed to reinforce and practice the learning objectives. Homework is a learning activity (Practice) – an opportunity to develop understanding or determine areas needing more work. Your homework problem solutions should be complete, detailed, and well organized (e.g., diagram, givens, unknowns, equations, substitution, answer with units). Homework is assigned almost daily and your homework must be submitted by the date/dates discussed in class or on the calendar. Furthermore, homework (i.e. practice) NOT properly completed **prior to** the unit test review day will result in you being unable to take, and benefit from, a testing retake. A legitimate attempt at a Homework Problem or Question must include a neat, organized presentation, on paper, of **a)** Sketch, **b)** Labeled variables (known, unknown, zeros, and other given information), **c)** equations for possible use, **d)** substitutions, and **e)** work for each problem. You may not always come up with a full solution for a problem, but unless you do the set-up steps, you cannot legitimately explain/solve the solution. (Your work, rather than the final answer, demonstrates your understanding. That is, you can demonstrate almost complete understanding of a learning standard even though you obtained the wrong answer



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if you have the correct process/setup. You cannot demonstrate understanding if your process is incorrect- or non-existent- even though your final answer may seem correct.)

Whiteboarding. Whiteboarding consists of small groups collaboratively presenting (practicing) their solution(s) to a problem that they sign up for, or are assigned. The questions that are asked, debated, and answered during the discussion are critical to the learning of the class. Sometimes individual students will be responsible for demonstrating a solution.

Peer Instruction. Peer instruction is a process in which the instructor presents a conceptual question. Some questions are from the homework and some are new. Students individually submit their answer to the question. The instructor may then display the percentage of students who reported each possible answer and students then question, discuss, debate, and defend their answers to each other. Students then resubmit their answer to the question, which may have changed. The instructor then presents and explains the correct answer.

Lecture and Demonstrations. At times, I will introduce new concepts by presenting the new material with a lecture or demonstration. Sometimes, I will model how to solve problems by leading the class through sample problems.

Labs. At times, you will explore new concepts starting with a lab and we will discuss our observations and results afterward. You will develop understanding of many learning standards through these activities and associated notes in your lab portfolio as you perform the AP Science Practices. This is an excellent opportunity to practice and receive feedback on your understanding of the concepts and performance of the science practices.

Quizzes. You will typically take one or more quizzes for each unit to help you assess your understanding of the more challenging concepts.

Lab Portfolio. You will demonstrate performance of the AP Science Practices through the selection of labs from your Lab Notebook in your electronic Lab Portfolio- a Google Lab File shared only with me. Your lab portfolio is organized around the AP Science Practices. You curate your lab portfolio such that you demonstrate your understanding of each of the AP Science Practices and reflect on why the labs you have selected are excellent examples of your performance. The portfolio of labs are shared with the instructor electronically will typically be graded (electronically) AT (or near) THE END OF THE SEMESTER without a grace period for missing labs. There are no re-takes on these labs. The initial labs will be submitted during the course of semester 1 and will have detailed comments and suggestions and will serve as a guide for what should be included in future lab submittals. Labs not properly shared in a timely fashion will not be accepted for late credit. Labs that do not constitute your own work will be given zero credit. If you have questions about what may or may not be shared with all lab partners, please ask. Common sense usually prevails in these matters.



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Exam. You will demonstrate your understanding of most learning standards through exams. The exams are a combination of multiple choice and free-response problems. On the exam, you are allowed to use a calculator and the AP Physics 2 Table of Information and Equation sheets provided. You must show all your work to earn credit on free-response problems as they are assessed in the same manner as on the AP Physics 2 exam. Your work, rather than the final answer, demonstrates your understanding. That is, you can demonstrate almost complete understanding of a learning standard even though you obtained the wrong answer if you have the correct process. Similarly, you cannot demonstrate understanding if your process is incorrect even though your final answer is correct.

Grading Disbursement

Semester grades for all classes (prior to the final exam) will be calculated by a weighted average. As part of the calculation for the overall semester grade, final exams/projects will not exceed 15% of the semester grade.

A = 100-90%, B = 89-80%, C = 79-70%, D = 69-60%, F = 59-0%

Semester Grade:

- Coursework = 85% (Evidence of Learning = 90%, Practice= 10%)
- Final Exam = 15% *Final Exam Format:* Edit by teacher

Additional Grading Details

Grading is done on an individual basis, you are not competing with your classmates. Most summative assessments are graded on a 1-5 scale in a manner consistent with the AP Physics 2 exam:

5: Extremely well qualified; **4:** Well qualified; **3:** Qualified; **2:** Possibly qualified; **1:** No recommendation

This scale is converted to percentages as reported in Infinite Campus. A 5 corresponds to a 100%; a 4, 88%; a 3, 75%; a 2, 62%; a 1, 50%.

The semester grade is determined by percentage:

A: 100% - 90% B: < 90% - 80% C: < 80% - 70% D: < 70% - 60% F: < 60% - 0%

Any questions about grades will be addressed outside of class time. Please keep all graded materials until the end of the semester. The most current grade that I have for you is available on the school website but may not reflect all lab portfolio content immediately. **Lab portfolios** are typically graded near the end of the semester, and are a 'work in progress'- meaning, you should learn from previous feedback (written and/or verbal) and incorporate improvements in your labs. Course grades of A, B, and C are counted as weighted grades.

As a rule, no extra credit will be issued.

Grading Practices

Grades communicate each student's progress toward mastery of goals/standards for the course.

- Infinite Campus Symbols/Comments:
 - A score of "Missing" (M) will indicate an assessment has not been turned in and the comments section will include a specific date by which students can still submit. After that date, a zero (0) will be recorded.
 - Any score may also have a comment indicating the due date, turned in, late, reassessment eligibility



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including the timeline and/or reassessment final scores.

- A zero indicates that no attempt was made by the student. If a legitimate attempt is made on an assessment and practice work has been completed in a consistent and timely manner (*completing 80% of practice listed in Infinite Campus.*), a score of 50% will be the lowest possible grade.
- Late Work:
 - Evidence of Learning work submitted after the original due date cannot be penalized more than a total of 10% and can be submitted for credit up to 5 days after the original due date.
 - Practice Work is not accepted for credit after the due date.
- Other:
 - No extra credit will be issued.

Academic Integrity Code

District 203 students are challenged to address the academic process enthusiastically, diligently, and most importantly, honestly. It is the responsibility of our students, teachers, and administration to uphold the fundamental academic values of honesty, responsibility, fairness, respect, and trust. The integrity of our district's academic programs is built upon these principles.

Academic integrity violations include cheating; plagiarism, self-plagiarism or copy infringement; obtaining or providing an unfair advantage; falsification of documents; unauthorized access to records; and inappropriate collaboration, whether intentional or unintentional. The classroom teacher and administration will collaborate and exercise professional judgment in determining academic integrity violations.

Reassessment Policy

The purpose of reassessment is to allow students to demonstrate mastery of course standards in which they remain deficient. Higher reassessment grades will replace the original assessment score, but will not exceed 80%.

- Practice work is not eligible for reassessment.
- Evidence of Learning work with a score below 80% is eligible for reassessment if students have:
 - Demonstrated readiness through timely and consistent completion of practice work. *This means completing 80% of practice assigned.*
 - Completed designated learning experiences as assigned by the teacher **as outlined below:**
- Timeline: Reassessments must be completed 5 school days after the student receives feedback (unless otherwise determined by the instructor).
- Project-Based Assessments that include multiple opportunities for feedback and improvement in the assessment process will represent multiple attempts and be considered a reassessment.
- **To be clear**, if you are still developing your understanding after the exam (scores of 1, 2, or 3), you may, at my discretion, have another opportunity to demonstrate your understanding. Please note that reassessments are designed to be at least as challenging as the summative exam- however, AP-level content is not always available or readily creatable for all topics. Before you attempt a reassessment, you will complete additional practice to prepare. At a minimum, you are required to make corrections to your summative exam and discuss your learning with me. You are responsible for completing the additional practice before the reassessment. Reassessments must be requested in advance and are scheduled at my convenience- usually before or after school. The maximum score on a reassessment is a "3.5". Your lab portfolio is an ongoing representation of your understanding of the AP Science Practices and, therefore, you have the opportunity to respond to early-semester feedback and demonstrate your understanding



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before the lab portfolio is submitted for a score. Homework standards (mentioned above) must also be met in order to take retakes.

Student Communication

- You are encouraged to communicate with their teacher regarding questions.
- Teachers make every effort to respond to emails and phone calls within 24 hours during the workweek.
- The best way to communicate with me is through email or the school Google Chat; however, if you haven't received a response within 48 hours, please resend the email. Your email may have been filtered if you aren't using school e-mail.

Additional Resources for Support

- You can make an appointment with your teacher should you need additional instruction or support in learning material. Email: mrowzee@naperville203.org, Google Chat. *Office: 150; Classrooms: 142. Office hours: Contact me, let me know you'd like to meet. With ample advance planning, we can almost always find a common time.
- You can attend After School Tutoring in the Learning Commons Monday, Wednesday, and Thursday from 3:15-4:15 to receive extra support or to work on assignments.
- You can drop in to work with a peer tutor during lunch periods or before school in the Literacy Center.

Parents or Guardians Partnership

Naperville North believes in a collective partnership with parents/guardians which provides students the best opportunities for success.

Some ways parents/guardians can support their student's learning are:

- Actively check Infinite Campus for their student's grades.
 - Infinite Campus is a tool to progress monitor student work until the final course grade is posted.
 - Monthly progress grades are posted and represent the current grade of a student in the course at that moment in time.
- Discuss missing assignments, reiterate due dates, help organize folders, materials, assignment notebooks, and review upcoming projects and assessments.