

Physics for Scientists and Engineers I (Phys 201, section 02) Syllabus

Physics 201 provides an introduction to mechanics (how and why things move), vibrations and waves, and thermodynamics (how energy flows and work is done). Properties of materials and fluids will also be covered. Electricity and magnetism, and optics, will be considered separately in Phys 202, and quantum physics and relativity in Phys 303-304. Calculus is used, but not extensively in Phys 201. Math 171 with grade of C or better is prerequisite, or placement in Math 172 or higher. We will cover chapters 1-21 of the text by Randall Knight. Phys 201 is a 4-credit UCORE course in the Inquiry in Physics Sciences category (PSCI); see [UCORE learning goals](#).

Expected outcomes

By the end of the course you should understand the basic principles of kinematics (motion; position, velocity, acceleration) and dynamics (force, work, energy), rotational motion, waves and oscillations, fluids, and thermodynamics. You will learn how to think critically about physical problems by approaching them using a general four-step procedure: (1) identify an appropriate model or context, (2) visualize the problem, (3) apply physical laws and principles to arrive at a solution, and, finally, (4) assess the result. By the end of the semester you should be able to analyze a broad range of physical problems that affect us as individuals and the society at large.

General information

Instructor: Prof. Gary S. Collins, Webster 554, office: 335-1354, cell: 336-9225.
Class hours: TTh, 14:50-16:05, Webster Physical Sciences 16 (also known as B16).
Office hours: right after class, by appointment, or whenever my office door is open.
Problem solving sessions (optional): Tuesdays, 17:00-18:00, Webster 16.
My email: collins@wsu.edu (include "201" in the subject line so that I can find it).
Required text: Physics for Scientists and Engineers: A Strategic Approach, Vol. 1, Randall Knight (Pearson, 4th ed., chap 1-21, ISBN 9781323407394); a "fat" version with chapters 1-35, ISBN 9780133942651 may also be used in Physics 202, but is unwieldy to carry around.
Laboratory fee: A \$35 lab fee is charged for this course.
Blackboard course page: link from <http://learn.wsu.edu> to the course page for Physics-201. The blackboard page will have links to course material, including overheads, homework and exam solutions, and access to *MasteringPhysics*.
MasteringPhysics: *MasteringPhysics (MP)* is required for homework, to which you will connect through Blackboard. Please note that there is a special access kit for this course with ISBN 1323466509; purchase only this kit, from the Bookie, Crimson and Grey, or online from Pearson, or it may not work! Enter your WSU student number when you enroll in *MasteringPhysics*.
Public home page: <http://www.wsu.edu/~collins/201>
Syllabus: <http://www.wsu.edu/~collins/201/syllabus.pdf> (remember to reload)
Schedule: <http://www.wsu.edu/~collins/201/schedule.pdf> (reload).

Special Note: Physics 201 laboratories begin meeting during the *first* week of classes, August 22-24. Students with odd lab section numbers go to room 422. Students with even lab section numbers go to room 241.

Course grading and format

Grading

Grading uses the *absolute* grade scale given below. The course grade will be based on homework and three hour exams, the laboratory, and a final exam, with contributions shown below. Your course letter grade will be determined by composite percentile grade for the whole course.

Homework + Hour Exams	45%
Laboratory	25%
Final exam	30%
Total	100%

A	90-100 %
A-	85-90 %
B+	80-85 %
B	75-80 %
B-	70-75 %
C+	65-70 %
C	60-65 %
C-	55-60 %
D+	50-55 %
D	45-50 %
F	0-45 %

During class

You are expected to attend class. You will be introduced to new topics and see physics demonstrations. You will learn how to approach and solve problems. Problems will tend to be more conceptual in class and more quantitative in homework.

Homework

Do your homework! There is no substitute. Students who don't put in a good effort often flunk the course. Homework will be assigned and graded online. Due dates will be posted on the *MP Course Schedule* and normally follow presentation of new material in class by one week. Late homework gets no credit! Homework will be scored uniformly at 1 point per problem.

Exams

Three hour exams are scheduled through the semester. Exams will be closed-book. Ahead of each exam, I will provide an equation sheet that will also appear on the exam. The equation sheet can be used as a guide to help prepare for the exam, but you should not expect it to include every equation you might need to use; you should be able to derive some simple ones. Exam problems will be similar to homework problems, sample problems in the text, and in-class exercises. Study them all. NO make-up exams will be given! A missed exam counts as 0 (zero). However, your lowest hour exam grade will be replaced automatically by a greater cumulative homework score at the end of the semester. Thus, in addition to demonstrating your grasp of the subject and helping you to prepare for exams, a good homework grade provides "insurance" against a low or missing exam grade. Bring a scientific calculator (graphing calculator is Ok) and writing implements to each exam. Non-native English-speaking students are welcome to bring an electronic dictionary to exams, with prior approval. Cell phones and all other communication devices must be turned completely off during exams.

Final Exam

The final exam will be Monday, December 11, 10:10-13:00, in the usual classroom, Webster 16.

Laboratory

Attendance in the laboratory is mandatory. Deficient performance (defined as less than a 50% laboratory grade) will result in a *failing grade for the entire course*. The lab manual and lab schedule can be found at <http://hub.wsu.edu/physlabs/physics-201/>. For details on laboratory grading refer to the *Physics Lab Syllabus* in the lab manual. Paper copies of the lab manual will be distributed to students during the first lab session, but you will need to purchase and bring your own lab notebook with carbonless copies. They may be purchased at the Bookie or online. Physics 201 laboratories will begin meeting during the *first* week of classes, August 22-24. Students with odd lab section numbers should go to room 422. Students with even section numbers should go to room 241. The last regular laboratory exercises will be during the week of November 28-30, the week before Closed Week. All laboratory work must be completed and submitted before 5 PM the Monday of Closed Week. There will be a final lab exam during closed week, Dec. 5-7; go to your regular lab session. If you have questions about the laboratory, you may contact your lab teaching assistant or Dr. Marc Weber, Director of Laboratories, Webster 328, 335-7872 or 335-3398, email:physics.labs@wsu.edu,

I will orient you to the upcoming laboratories each week and show how they connect with lecture material, but grading of labs is completely independent of the lecture component of the course! Questions about lab procedures and grading should be directed to your laboratory teaching assistant or to Dr. Marc Weber. A different grading scale is used in the labs (e.g., 80-90= "B") than in the lecture component of the course. At the end of the course, your final lab grade will be converted to the lecture grade scale given above and then used to compute your overall course grade. Later, if you wish to certify one of your lab reports as part of your portfolio, please seek approval and signature from your laboratory teaching assistant since I am not sufficiently familiar with the rubrics used to evaluate the reports.

Tips for doing well

Read "Preface to the Student" in the textbook. It's written for you!

Students who have never had a high school physics course must be extra diligent in keeping up with the material. Lots of new concepts are introduced in each chapter. Avoid getting overwhelmed by keeping up with the homework and readings.

Attend classes and ask questions. If you have a question from a previous class, send me a quick email ahead of the next class and I will endeavor to respond, as time permits.

Read ahead each day. Frame questions from your readings.

Do the homework. Homework helps you internalize what you are learning and gives practice. Don't skimp! Students who try to get by without doing homework often flunk the course. And your homework grade gives "insurance" against a low exam grade.

Time commitment. On average, students should expect to devote 2-4 hours of effort on homework for each chapter, and several additional hours to prepare for each exam. This is apart from the time you need to prepare for laboratory experiments and compose lab reports.

Study with fellow students. Understanding comes through the act of trying to explain concepts to others. You are encouraged to discuss homework problems freely with your peers. However, submitted homework and exam solutions must be entirely your own. Plagiarism from any source or other cheating may have consequences up to failing the course.

Meet individually with me. Don't hesitate to ask me for help. That's my job. To get the most effective help, make a list of items you don't understand ahead of a meeting with me.

Attend optional problem solving sessions at times to be announced.

Free tutoring is offered by several units on campus and should be available starting in about the second week of the term. Look for announcements.

Other resources. There are many good resources on the web. Many course topics are summarized at the Hyperphysics site: <http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html>. Great tutorial videos are at Khan's Academy: <https://www.khanacademy.org/science/physics>.

A note about learning physics

Several hundred years ago, physics was known as "natural philosophy", a framework of logic developed out of the study of natural phenomena. Galileo and Newton were notable pioneers in the study of "mechanics", the main branch of physics we will survey this term. More than in other disciplines, physics builds on a foundation of basic principles that you will learn to master and apply. Most students come to their first physics course with incorrect understandings about how the world works. One very common misconception is that if no force is acting on a moving object, it will slow down and stop. You will come to a more correct understanding through proper application of Newton's three laws of mechanics. An important part of learning will be to "unlearn" such misconceptions. By the end of the course you will hopefully obtain great satisfaction from being able to apply a small number of basic principles to understand a broad range of phenomena and problems.

Important fine print

Disability Accommodations: Students with Disabilities: Reasonable accommodations are available for students with a documented disability. If you have a disability and need accommodations to fully participate in this class, please either visit or call the Access Center to schedule an appointment with an Access Advisor. All accommodations **MUST** be approved through the Access Center or Disability Services. For more information contact a Disability Specialist on your home campus. **Pullman:** 509-335-3417, Washington Building 217; <http://accesscenter.wsu.edu>, Access.Center@wsu.edu Both your lecture instructor and the lab director must be notified of approved accommodations during the first week of lecture. Accommodations might not be available if requested later.

Academic Integrity: Academic integrity is the cornerstone of higher education. As such, all members of the university community share responsibility for maintaining and promoting the principles of integrity in all activities, including academic integrity and honest scholarship. Academic integrity will be strongly enforced in this course. Students who violate WSU's Academic Integrity Policy (identified in Washington Administrative Code (WAC) 504-26-010(3) and -404) will either fail the assignment or fail the course, will not have the option to withdraw from the course pending an appeal, and will be reported to the Office of Student

Conduct. Cheating includes, but is not limited to, plagiarism from any source and unauthorized collaboration as defined in the Standards of Conduct for Students, WAC 504-26-010(3). You need to read and understand all of the definitions of cheating:

<http://app.leg.wa.gov/WAC/default.aspx?cite=504-26-010>. If you have any questions about what is and is not allowed in this course, you should ask course instructors before proceeding. If you wish to appeal a faculty member's decision relating to academic integrity, please use the form available at conduct.wsu.edu.

Classroom Safety: Classroom and campus safety are of paramount importance at Washington State University, and are the shared responsibility of the entire campus population. WSU urges students to follow the “Alert, Assess, Act,” protocol for all types of emergencies and the “[Run, Hide, Fight](#)” response for an active shooter incident. Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT in the most appropriate way to assure your own safety (and the safety of others if you are able). Please sign up for emergency alerts on your account at MyWSU. For more information on this subject, campus safety, and related topics, please view the [FBI's Run, Hide, Fight video](#) and visit the [WSU safety portal](#).”

An Emergency Guide is posted near each exit of each lecture room. If faced with an emergency, follow the “Alert, Assess, Act,” protocol: Remain ALERT (through direct observation or emergency notification), ASSESS your specific situation, and ACT to ensure your own safety and the safety of those around you. In case of fire, leave the building, using the stairs if necessary; do not use the elevators. If the emergency involves an active shooter, your options are to RUN, HIDE, or FIGHT (oem.wsu.edu/emergency-procedures/active-shooter). Each door in the lecture and lab rooms can be locked from the inside in case of a lock down.

Syllabus subject to change.

Gary S. Collins, August 15, 2017