

Physics 195 - Physics I

Syllabus - Spring 2020

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Office Hours: M, T 4:30-5:30 PM
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T, Th 12:00-1:00 PM
Also by appointment
Web Page: <http://www2.truman.edu/~mgoggin>
or <http://mgoggin.sites.truman.edu/>

There will be a link for the course on my website. There I will post assignments and other important information (like this document). I do not use Blackboard for a variety of reasons.

Required Items:

- *University Physics, 13th or 14th Edition* Vol. 1 (or the entire text if you plan to take more physics), by Hugh D. Young and Roger A. Freedman [Note: You do not need the online access code.]
- A scientific calculator

From the Catalog: This course begins a survey of basic physics including Newtonian mechanics and conservation laws, fluid behavior and thermodynamics. Students learn the concepts and develop the skills needed for advanced coursework in science and engineering. Some of the history of physics, its technological, and philosophical aspects, and its place in the history of ideas are explored. This course includes a laboratory component.

Credits: 5

NOTE:

* Honors Scholar Course.

** This course fulfills the Scientific: Physical Science Mode of Inquiry of the Liberal Studies Program.

*** This course counts toward the 63-credit Liberal Arts and Sciences (LAS) graduation requirement.

**** The Science Lab Fee applies to this course.

Prerequisite: MATH 198 - Analytic Geometry and Calculus I with grade of "C" or higher.

Note: I will assume you all know and *can readily use* the mathematics covered in Analytical Geometry and Calculus I.

General Information: We will cover Chapters 1 through 20 of the text. Yep, we will be covering 20 chapters in 16 weeks. You can do the math. This will be a very intense introduction to some of the fundamental laws of physics and some of the basic phenomena in the world around us and beyond. Beyond learning the content of these chapters, you will also learn how to think like a physicist: how to identify the salient information in physical systems and translate that information into mathematical equations and then solve them.

You will need to understand **everything** by the end of the class. The physics curriculum is structured like a spiral staircase. At each stage of the curriculum the material builds on what came before, including preceding courses. You will periodically return to the same material but at a higher level. The same applies within a course. And like a staircase, the upper levels are only as strong as the levels below. If you don't stay on top of the current material you will not be able to learn subsequent material very well, if at all. It

will be very difficult to catch up if you fall behind. In this class we lay the foundation for the rest of your physics classes. The better you learn the material in this course, the better you will do later - not just in your physics courses but also in your other science and math courses. This is because physics is everywhere. It is the foundation of the other sciences. Furthermore, everything in physics connects to everything else in physics. Some of the material also connects to all of the sciences (including computer science).

Course Structure: The structure of the course is nominally 4 hours of lecture and 1 hour of recitation. Rather than reserve a special hour for recitation I prefer to have a more integrated structure where the typical recitation activities such as answering questions about homework problems and going over example problems are embedded in the normal course structure. That way we can address problems when they arise rather than saving them until recitation. I will not lecture straight from the text because I expect you to read it. Class time will be spent on helping you *understand* the material in the text. To that end, I expect you to read the sections of the text listed in the course schedule. You should understand the examples presented in the text for those sections. During class, I will answer questions that arose in your reading; the answers may take the form of mini-lectures. **You should listen to your classmates' questions and my answers even if you think you understood everything in the reading or the question seems to be off-topic. (You may discover it is not off-topic.)** If you do not do the reading you will probably get lost. If there are no questions, I will probably ask you questions about the material. We will work together on extra example problems.

Homework: Homework will be collected twice a week on Mondays and Wednesdays. The assignments will be posted on the course website. The homework will be graded in the following way. Each problem in an assignment will be graded simply as "correct" or "incorrect". The assignment will be returned the next day. You will have until the next class period to correct those problems marked "incorrect". The resubmitted assignment will then be graded.

Quizzes: There will be a quiz every week except weeks with exams. The quizzes will be one or two problems from a list of designated Quiz problems that is also posted on the homework page. You may use your textbook to take the quiz. You may not use notes. You will have enough time to complete the problem(s) if you have done the homework. If you have not done the homework you will not have enough time to do the problem(s).

The laboratory section associated with the class is an important component of the course. So much so, that it has its own section which is next.

The Laboratory Section: The laboratory component of the course is an important part of learning physics. Experiment and systematic observation are what separate science from other disciplines. Physics is mostly an experimental science. (We usually call it astronomy when all we can do is observe a system without direct control over some parameter.) Experiment is an integral part of physics. Without experiment, physics is no different from philosophy or maybe mathematics. Therefore, your attendance at the laboratory section is mandatory; there are no exceptions: you will **fail the entire course** if you miss more than two laboratory classes without an excuse from me regardless of your grades in the other categories. The work you do in the laboratory section will contribute 15% to your overall course grade. I will provide more details about the laboratory section in a separate document.

Attendance: I will not be formally taking attendance in the sense that I will be calling roll at the beginning of class. However, your absence will be noticed and frequent absences will be noted. The structure of the course demands student involvement. To reward positive participation, I have included a 5 % class participation grade. It is the easiest 5 % that you will ever get in a physics class. But it is impossible to be involved while absent. Frequent absences will seriously hurt your participation grade. If you have a valid reason to be absent, for example illness or participation in a sanctioned University activity, you need to inform me before the class you will be missing or as soon as possible if you are physically unable to contact me before class. The only coursework that can be rescheduled after the work has been returned to the class is labwork. Labs may only be rescheduled for valid reasons. Don't miss lab! See above for consequences.

Inclement weather: Unless the University cancels classes, plan on class being held regardless of the weather.

Grades:

| | |
|--------------|--|
| 5 % | Class participation |
| 10 % | Homework |
| 15 (or 100)% | Lab work* |
| 10 % | Quizzes |
| 30 % | Best two out of three mid-term exams (15 % per exam) |
| 30 % | Comprehensive Final Exam |

* **VERY IMPORTANT:** If you are absent from more than two labs without a good reason, your grade for the *entire course* will be an F regardless of your grades in the other categories. I will be the final judge of what constitutes a good reason. Please contact me as soon as you know you will have to miss lab.

Exams: There will be three midterm exams and a comprehensive final exam. Because of the cumulative nature of physics each midterm exam will effectively be over all the material covered prior to the exam date.

Office Hours: Office hours are listed at the beginning of this document and can be found on my webpage. The listed hours are not the only times I am available for help. My listed office hours just indicate the times I guarantee (with possibly a couple of exceptions I will tell you about) I will be in or near my office (MG 3172) or my research lab (MG 3147). I encourage you to come and ask questions when you need help. If you cannot make it during the regular office hours, then please schedule a time to meet with me. My schedule is also posted on my door. You are also welcome to stop in if my door is open. A couple of my office hours are preceded by my Advanced Lab class. I am sometimes still in class helping students after 4:30. Please come down to MG 1009 or MG 1080 if I am not in my office at 4:30 on Tuesday or Thursday.

Academic Honesty: You are to do your own work on the assessment assignments of the course, e.g. quizzes, tests, and lab reports. It is okay to discuss homework assignments with each other to further your understanding of the material but the work you turn in should be your own version of the solution. In addition, you must learn to properly cite the work of others in your work when appropriate. It is part of scientific writing to cite the work of authors who have preceded your work in a field and whose work directly influences your work. If you have questions about proper citation please ask me before you turn in the report. Plagiarism is using the work of others and claiming it as your own. Plagiarism will be grounds for disciplinary action that may include expulsion from school. Changing your experimental data is scientific misconduct and will result in more severe penalties than simply getting the “wrong” answer.

Tips for Success:

Do the homework! I cannot emphasize this enough. A significant part of this class involves analyzing and solving problems. The only way to improve is by doing. Simply “thinking through the problem” is not enough on most problems.

Do not just look up equations. When you do the homework try to understand the problem at a conceptual level first. Break it down into pieces and then find the equations that correspond to those pieces.

Read ahead and ask questions. Read the material to be covered in the next lecture and be prepared to ask questions about the parts that do not make sense.

Think about what the equations mean. Relate the equations to situations with which you are familiar.

Do not try to memorize how to do the examples and homework problems. Work to understand how the solutions to the examples and homework problems are produced. The test questions will be entirely new problems. Some of the same techniques you used in the homework will be needed to solve the test problems but you may have to combine techniques from different homework problems in the solution of one test problem.

Oh, and another thing: *Do* the homework.

Standard University Policies

Emergency Procedures: In each classroom on campus, there is a poster of emergency procedures explaining best practices in the event of an active shooter/hostile intruder, fire, severe weather, bomb threat, power outage, and medical emergency. This poster is also available as a PDF at this link: <http://police.truman.edu/files/2015/12/Emergency-Procedures.pdf> .



Students should be aware of the classroom environment and note the exits for the room and building. For more detailed information about emergency procedures, please consult the Emergency Guide for Academic Buildings: <http://police.truman.edu/emergency-procedures/academic-buildings/>

This six-minute video provides some basic information on how to react in the event there is an active shooter in your location: <http://police.truman.edu/emergency-procedures/active-shooter/active-shooter-preparedness-video/>

Truman students, faculty, and staff can sign up for the TruAlert emergency text messaging service via TruView. TruAlert sends a text message to all enrolled cell phones in the event of an emergency at the University. To register, sign in to TruView and click on the “Truman” tab. Click on the registration link in the lower right of the page under the “Update and View My Personal Information” channel on the “Emergency Text Messaging” or “Update Emergency Text Messaging Information” link. During a campus emergency, information will also be posted on the TruAlert website <http://trualert.truman.edu/>.

Disability Services: To obtain disability-related academic accommodations students with documented disabilities must contact the course instructor and the Office of Student Access and Disability Services (OSA) as soon as possible. Truman complies with ADA requirements. For additional information, refer to the Office of Student Access and Disability Services website at <http://disabilityservices.truman.edu/> You may also contact OSA by phone at (660) 785-4478 or email <mailto:studentaccess@truman.edu>

Title IX: Truman State University, in compliance with applicable laws and recognizing its deeper commitment to equity, diversity and inclusion which enhances accessibility and promotes excellence in all aspects of the Truman Experience, does not discriminate on the basis of age, color, disability, national origin, race, religion, retaliation, sex (including pregnancy), sexual orientation, or protected veteran status in its programs and activities, including employment, admissions, and educational programs and activities. Faculty and staff are considered mandated reporters and therefore are required to report potential violations of the University's Anti-Discrimination Policies to the Institutional Compliance Officer.

Title IX prohibits sex harassment, sexual assault, intimate partner violence, stalking and retaliation. Truman State University encourages individuals who believe they may have been impacted by sexual or gender-based discrimination to consult with the Title IX Coordinator who is available to speak in depth about the resources and options. Faculty and staff are considered mandated reporters and therefore are required to report potential incidents of sexual misconduct that they become aware of to the Title IX Coordinator.

For more information on discrimination or Title IX, or to file a complaint contact:

Dr. Lauri Millot, Institutional Compliance Officer, Title IX and Section 504 Coordinator

Office of Institutional Compliance

Violette Hall, Room 1308

100 E. Normal Ave

Kirksville, MO 63501

Phone: (660) 785-4354

<mailto:titleix@truman.edu>

The institutions complaint procedure can be viewed at <http://titleix.truman.edu/files/2015/08/University-Complaint-Reporting-Resolution-Procedure.pdf> and the complaint form is accessible at <http://titleix.truman.edu/make-a-report/>.

Credit Hour Justification: The *minimum* investment of time by the average Truman student necessary to achieve the learning goals in this course are not less than one hour (50 minutes) of classroom instruction

and a minimum of two hours of out of class student work each week per credit hour awarded or at least the equivalent of two hours (1:50) of laboratory work in the lab and 1 hour of work outside the lab time each week per credit hour awarded. This average time per week for an average student may have weekly variations.

Academic Dishonesty: The General Catalog states: Students are expected to do their own academic work. Any student involved in cheating on a paper, an examination or in any other form of academic dishonesty is subject to disciplinary action, including suspension or expulsion from the class, the students academic program, or the University.

Serious cases of academic dishonesty are reported by the faculty member to his or her Department Chair and to his or her Dean, who may take additional disciplinary action against the dishonest student, including suspension or expulsion from classes in the School. The Dean reports the dishonesty to the Vice President for Academic Affairs, who may also report it to the Vice President for Student Affairs. The Dean may also report the dishonesty to the School in which the dishonest student is enrolled as a major; the Dean of this School may suspend or expel the student from the academic program in the major. The Dean of Students may also suspend or expel the student from the University as outlined in the Student Conduct Code for incidents of academic dishonesty. More information can be found in the General Catalog (http://catalog.truman.edu/content.php?catoid=13&navoid=625#Academic_Dishonesty) and the Student Conduct Code Section 8.050.01 (<http://policies.truman.edu/policylibrary/student-conduct-code/>)

Attendance Policy: The General Catalog states: A student is expected to be present at all classes. Regular class attendance is necessary in order for a student to achieve the desired standard of academic achievement. Irregular attendance normally results in lower levels of achievement. Students are therefore expected to contact instructors as soon as possible when an absence occurs.

More information can be found in the General Catalog: [://catalog.truman.edu/content.php?catoid=13&navoid=625#Attendance_Policy](http://catalog.truman.edu/content.php?catoid=13&navoid=625#Attendance_Policy)

FERPA: Education records are protected by the Family Education Right to Privacy Act (FERPA). As a result, course grades, assignments, advising records, etc. cannot be released to third parties without your permission. There are, however, several exceptions about which you should be aware. For example, education records can be disclosed to employees or offices at Truman who have an educational need to know. These employees and offices may include your academic advisor, the Institutional Compliance Officer, the Registrars Office, or Student Affairs depending on the type of information. For more information about FERPA, see <http://www.truman.edu/registrar/ferpa/>.

Disruptive behavior: “Behavior that persistently or flagrantly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students ability to learn and an instructors ability to teach. A student responsible for disruptive behavior may be asked to leave class pending discussion and resolution of the problem and may be reported to the Office of Student Conduct.” (*From Washington State University, suggested by Lou Ann Gilchrist*).