

# Lab Syllabus

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To apply what you learn in the lecture, you will need some skills and concepts that are best learned in the laboratory. These skills include model building, data collection and analysis, laboratory record keeping, and formal reporting of results. You will also need enough statistics to perform elementary hypothesis testing. These skills apply to quantitative work in many fields, including the health- and life-sciences, math, and engineering. Although these activities should improve your understanding of the lecture material, our principle goal is to turn theory into practice.

Most students in introductory physics courses have had lab experience in chemistry and other disciplines. We build on that experience. Your teaching assistants will not be as specific about their requirements as your chemistry teaching assistants were. You will often be expected to figure things out on your own in consultation with your lab partner, and will be graded on the quality of those decisions. Since you will be working more independently, you will be required to document your work more carefully, with less input from your teaching assistant.

To accomplish these goals, you will be expected to:

- Build simple physical models that incorporate lecture material.
- Design and perform simple experiments to test or improve these models.
- Employ representative software packages for data collection and analysis.
- Document your experimental methods, results, and data analysis in a lab notebook.
- Evaluate and compare results using uncertainties.
- Communicate your work in writing (short and long formal assignments).

## Student responsibilities

- Read the syllabus. The regulations/guidelines in this syllabus take precedence over any oral commitments that may be made. The lab director is responsible for the final interpretation of these policies.

- Before each lab, read the lab manual and related course material, particularly if the material has not already been covered in lecture.
- Bring your lab manual, calculator, pen and pencil, a lab notebook with carbonless copies, and scratch paper to lab each week.
- Come prepared to perform mathematical calculations based on the level of math appropriate for the course. This includes algebra, geometry, and trigonometry. For Physics 201 and 202, calculus is also required.
- Do not bring food, tobacco, or beverages into a lab room.
- Arrive at your lab on time. Note that the lab rooms change from week to week. The room schedules are posted on the bulletin boards across from the elevators on the second, third and fourth floors of Webster Hall.
- Complete all labs and the lab exam. If you miss or expect to miss a lab due to sickness or another valid reason, arrange for a make up laboratory as described in the Requests for Make-Up Laboratories section of this syllabus.
- Make sure that all submitted work is your own. Academic dishonesty is not tolerated and is grounds for failing the course.

## Final lab grades

Your final lab grade is awarded on the basis of:

Lab Assignments	80%
Lab Exam	20%

The final lab score is calculated by adding 80% of the assignment score to 20% of the exam score. From this total, 6.667 points (one-twelfth of the total assignments points) will be subtracted for each week of missing lab work. All laboratory exercises are important. No scores are dropped. At the end of the semester, your final lab score will be sent to your lecture instructor, who incorporate it into your final course grade. If your lecture instructor uses a different grade scale, your lecture instructor will make an additional adjustment. Consult your lecture instructor for the weight given to the lab grade in your total course grade.

Lab assignments include (1) lab notes recording during lab, (2) complete or partial formal reports of laboratory work; and (3) tutorials and quizzes performed during lab. Although each lab partner in a group will report the same data, your data analysis, discussion of results, and conclusions must be your own. For more information regarding lab notes and reports, refer to the “Lab Notes and Reports” section immediately following the syllabus.

The lab exams are administered during Closed Week, in your regularly scheduled laboratory. The exam may include any experimental techniques, methods of data analysis, and/or concepts covered during the semester. You may refer to your graded lab work for the current semester and the lab manual during the exam. You may not refer to the textbooks or other references. Work on the exam is individual (no lab partners). Bring your calculator.

Questions regarding grades on lab assignments need to be discussed with your teaching assistant within two weeks of receiving the graded material (earlier at the end of the semester). Final lab grades will be posted on the bulletin board on the 3rd floor of Webster Hall during Finals Week. To affect the lab grade submitted to your instructor, changes must be made by Friday morning of Final Exam week. Errors that affect your physics course grade will be corrected after final grades are submitted to the Registrar, if necessary.

By Physics and Astronomy Department policy, students earning lab grades below 50 will receive an F grade for the course, irrespective of their performance in the lecture portion of the course. On the other hand, students who fail the course but achieve a laboratory grade of at least 80 may choose to “carry over” this score when the course is retaken. To take advantage of this option, you must notify the lab director no later than the first week of the semester that you are repeating the course. 100-level labs cannot substitute for 200-level labs.

## Assignment submission policies

Records of work completed during lab, including tutorials, must be turned in to your teaching assistant before you leave the room. Records of work completed after lab are normally due at the beginning of the next lab session. Work completed after lab (but before the next lab session) can be turned in using the homework cabinet in the hall on the third floor Webster Hall. All work must be submitted to your laboratory teaching assistant by Monday afternoon, the day before the lab exam, to be counted toward your final lab grade.

Turn in all lab assignments promptly. A penalty of ten points per working day is assessed for late work. It is important that you submit work on time even if it is not complete. You are free to complete your work in your lab notebook after the deadline, provided that the late entries are dated with the day the work is actually performed. You will not receive credit for this late work, but it may help you on the lab final. If you have reason to believe that an assignment that you submitted has been lost, report it immediately to your teaching assistant.

## Requests for make up laboratories

**Do not attend lab if you are ill with something contagious.** When you are well enough to attend, contact the lab director to arrange for a make up laboratory. Unless your illness lasts more than a few days, laboratories must be made up within one week of the missed lab.

If you expect to miss your regularly scheduled lab to attend a university-approved activity, you are also expected to make up the missed laboratory. University-approved activities include music and athletic events in which you perform. Make up labs are not available for study sessions, extra credit activities, or exams in other courses. Make up laboratories for scheduled absences must be requested the week before the scheduled absence. Make up space is limited, and may not be available if you request a make up lab later.

To schedule a make up laboratory, contact the lab director at [physics.labs@wsu.edu](mailto:physics.labs@wsu.edu). Your request should include your name, your course catalog number (Physics 101, 102, 201, 202, etc.), your regular lab section number, the name of the missing lab (e.g., Buoyancy), the reason why the lab

is being missed, and your e-mail address. You must also indicate when you might be available to make up the lab. Make up labs are usually offered during other lab sections of the same course, but sometimes in another course. Make up labs are available on Tuesdays, Wednesdays, and Thursdays only. All make up labs must be approved by the lab director.

Except for the last lab of the semester, make-up work must be submitted to the laboratory teaching assistants before Monday of Closed Week to be considered for credit. The physics labs close Friday before Closed Week to prepare for lab exams. Make-up labs are not scheduled during Closed Week. Make up labs for the last lab of the semester and the lab exam can sometimes be scheduled during Finals Week.

## **Student conduct**

“Washington State University, a community dedicated to the advancement of knowledge, expects all students to behave in a manner consistent with its high standards of scholarship and conduct. Students are expected to uphold these standards both on and off campus and acknowledge the University’s authority to take disciplinary action. The purpose of these standards and processes is to educate students and protect the welfare of the community.”—Quoted from the Preamble to the Washington State University Standards of Conduct for Students (<http://apps.leg.wa.gov/WAC/default.aspx?cite=504-26>).

A partial list of prohibited conduct appears in Washington Administrative Code (WAC) Section 504-26 (<http://apps.leg.wa.gov/wac/default.aspx?cite=504-26>). Of special importance to the laboratories is the false reporting of data, experiment results, information, or procedures. The data and results in your lab notebook and reports must result from your own work in the current semester. Reporting data acquired by others (including your lab partner if you did not contribute) or in previous semesters is academically dishonest. Fabrication of results, information, or procedures, and sabotaging other students’ work is also prohibited. Likewise, sharing information about the end-of-semester lab exam with students yet to take the exam is prohibited. Violations of this policy will affect your lab grade and may be reported to the Student Conduct Committee as instances of academic dishonesty.

Students are expected to avoid behavior that unnecessarily interferes with the learning of other students. We expect students to be on time to labs and lab exams and to mute their cell phones for the duration. Many physics concepts are subtle, and even the most intelligent students make mistakes. In this environment, it is important that students be willing to ask questions if they don’t understand what their lab partners say or do. To this end, we require that students and teaching assistants alike avoid behavior that discourages communication. This includes threats and insults. Students who repeatedly disrupt lab may be directed to leave the room and may receive a zero grade for that week’s lab.

## **Disability accommodations**

Reasonable accommodations are available for students with documented disabilities. If you have a disability and need accommodations to fully participate in the lecture, contact the Access Cen-

ter (Phone: 335-3417, e-mail: [access.center@wsu.edu](mailto:access.center@wsu.edu), URL: <http://accesscenter.wsu.edu>). All accommodations must be approved through the Access Center. You must notify the lab director during the first week of laboratories concerning any approved accommodations. Late notification may cause the requested accommodations to be unavailable.

## **Safety resources**

General information on campus safety is posted at <http://safetyplan.wsu.edu>—the Campus Safety Plan. Information on how to prepare for potential emergencies is posted on the Office of Emergency Management web site (<http://oem.wsu.edu/>). Safety alerts and weather warnings are posted promptly at the WSU Alerts site (<http://alert.wsu.edu/>). Urgent warnings that apply to the entire University community will also be broadcast using the Campus Outdoor Warning System (speakers mounted on Holland Library and other buildings) and the Crisis Communication System (e-mail, phone, cell phone). For this purpose, it is important to keep your emergency contact information up to date in MyWSU. To enter or update this information, click the “Update Now!” link in the “Pullman Emergency Information” box on your MyWSU home page (<https://my.wsu.edu/>).

Safety information that applies to the laboratories appears in the Lab Manual. Your teaching assistant will also present any safety information that applies to the current laboratory at the beginning of the laboratory. Students are expected to conduct themselves responsibly and take no unnecessary risks. Students who disobey the safety instructions will be directed to report to the lab director. All accidents and injuries must be reported promptly to your teaching assistant.

An Emergency Guide is posted by one door of each lab 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 the fire alarm sounds, leave the building promptly in an orderly fashion. If you are not on a ground floor, use the stairs. Do not use the elevators. After exiting the building, gather across from the basketball court behind Waller Hall (down the hill, south of Webster Hall, see Figure 1) with the other members of your lab. A representative of the Department of Physics and Astronomy will tell you when it is safe to re-enter the building. If this does not happen before the end of the lab period, you are free to leave for your next class. If the emergency involves an active shooter, your options are to RUN, HIDE, or FIGHT (<https://www.youtube.com/watch?v=5VcSwejU2D0>). Each lab room door can be locked from inside in case of a lock down.

## **Possible changes**

The lab director reserves the right to correct errors in the syllabus and to modify lab schedules and room assignments.

The lab director has delegated some authority to modify assignments and due dates to your teaching assistant. This helps ensure that you are graded according to the criteria stated during your lab meeting.

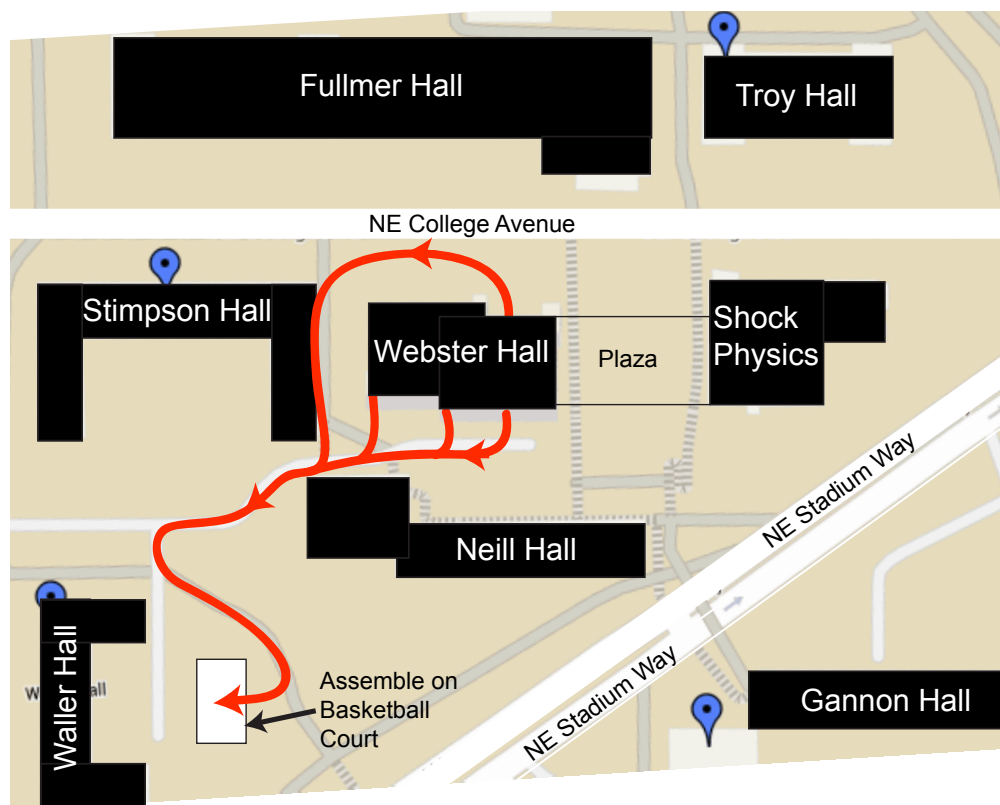


Figure 1. Physics and Astronomy assembly point. In case of a fire alarm, exit the building and gather at the basketball court behind Waller Hall. Use the stairs. Do not use the elevators in case of fire. A department representative will tell us when it is safe to re-enter the building.