San José State University
College of Science, Department of Physics & Astronomy
Physics 50 Laboratory: General Physics: Mechanics.
Sections , Fall 2019

Instructor:

Office Location:

Telephone:

Email:

Office Hours:

Class Days/Time:

Class Room: Science 305 or 307

Prerequisites: A grade of C or better in Math 30 or 30P (Calculus1)

Faculty Web Page
The greensheet of this lab may be found on http://physics.sjsu.edu/student_resources/index_syl.html

Course Description
Physics is the study of the natural laws that govern matter and energy. Every degree program in the “STEM” disciplines (science, technology, engineering, math) requires 8-12 units of physics. This is true of all accredited science and engineering degree programs, including here at SJSU. Physics 50 is a pre-requisite for almost all of your future courses in the College of Engineering and the College of Science. This course is a calculus-based introduction to classical mechanics, which is the branch of physics that covers the motion of objects (kinematics and dynamics), gravity, work and energy, momentum, rotational motion and harmonic (wave) motion.

In the lab portion of the course, we will use equipment to collect data to investigate the laws of physics pertinent to this course. Every student must register for the lab and earn a grade of at least 70% in lab during the same semester as the lecture course. It is required that you take and pass both the lab and the lecture in the same semester – if you fail either the lecture or the lab you will have to repeat the entire course (both lecture and lab) regardless of your grade in the lecture or lab.

Course Goals and Student Learning Objectives
Upon successful completion of this course, you will be able to:
A. Conduct yourself appropriately in a laboratory setting
B. Use scientific equipment such as force sensors, photogates and accelerometers to make quantitative measurements on observable physical phenomena.
C. Make useful plots of the data collected with this equipment.
D. Understand, qualitatively, what causes error and uncertainty in measurements.
E. Describe the motion of objects using physics terminology and concepts, such as velocity, acceleration, force, kinetic and potential energy, momentum and torque.
F. Assign the proper units and significant digits in the data you collect and the calculations you perform using those data.
G. Understand the relationship between forces and the response that objects have to those forces
H. Relate physics concepts to the world around you.
I. Predict the behavior of simple mechanical systems.

**Required text and online learning system**
You are required to purchase a separate lab manual for this course. This lab manual contains the activities for most of the labs this semester. During exam weeks, we will have a review session in lab. These count as a “lab activity” and you will turn in an assignment to be graded, so don’t skip review sessions just because you don’t think you need the review. It will be counted as an absence. Check the schedule to see what your lab section is doing each week. You should read through the lab manual before you go to your lab.

**How to succeed in the lab portion of Physics 50**
Lab is an essential part of the course. The lab always meets except on University Holidays such as Labor Day. It is important to be on time, do not leave early, and to actively participate in the lab. You will work in pairs or small groups, where everyone is expected to participate. If your lab partner insists on doing everything, or won’t participate at all, this is a problem and you should let me know. Group work is a reality in your upper division courses and in the real world, so let’s practice it here in lab.

**Assignments, Attendance and Grading Policy, Classroom Protocol**

**Attendance**
University policy states that attendance *per se* cannot be used to calculate a students’ grade. However, 100% of your grade in lab is based on your performance on activities that can only be done during your scheduled lab time, including turning in assignments that will be graded. Therefore, attendance in lab is mandatory and you cannot do these activities during another lab session or on your own time. By “activities”, we mean anything that occurs during lab, including problem sets as well as lab experiments.

The Physics 50 lab attendance policy is as follows: You may miss ONE lab session during the semester without major consequence to your lab grade. You do not need to provide a doctor’s note or other written excuse for one absence. A second absence is grounds for a WU in the course. However, if you have an extenuating circumstance that causes you to miss a second lab, you should meet with both your lecture and lab instructors, provide them with a documented excuse (doctor’s note, military orders from your CO, etc). “Extenuating circumstances” are defined in the course drop petition available here [http://www.sjsu.edu/aars/forms/](http://www.sjsu.edu/aars/forms/) .
Your lecture instructor will determine whether you are in good standing in the course (passing exams, performing adequately on homework, etc). If you miss a second lab because of an “extenuating circumstance”, your second missed lab counts as a zero among your other lab scores. If you are NOT in good standing, you should consider officially withdrawing from the course (“late drop”). If you miss a second lab but you ARE in good standing, you may still have a chance of getting C or better in the class. Missing a third lab is a non-negotiable withdrawal from the class and you may wish to attempt officially withdrawing.

If you miss NO labs during the semester, then you get extra credit – great job! Your lab grade will be your total points divided by N-1 labs that you did!

Arriving late to lab is unacceptable. Students who arrive late distract the instructor and are rude to their fellow students who then have to work with a clueless lab partner, or take time away from their education to get the latecomer caught up. The general rule is that a student who arrives late is officially absent from lab. Lab instructors have final say over when “lateness” officially becomes an “absence.” If you’re late, you do not get extra time for your pre-lab or proficiency quizzes, or lab activity. The same is true for leaving early without your instructor’s permission. Also, if a student leaves the lab for a prolonged period of time, the instructor may count that as an absence or count it against your participation grade.

**Lab protocol**

We do not work with any dangerous equipment or chemicals in the Physics 50 lab; however, we do want to help you develop professional lab etiquette that will serve you well when you DO someday work in a lab or jobsite where there are hazards. Therefore, you will be graded on how you conduct yourself in the lab, and we refer to this as “participation.” Participation factors into your lab grade both as its own stand-alone element in the grading policy (see next section) as well as on your weekly assignments that are turned in. Engaging in any of these or other “bad lab behaviors” will negatively affect your overall lab grade:

- Eating or drinking in lab (you may have a water bottle or candy bar but consume these in the hallway)
- Texting or using your laptop or mobile device in class, or more generally, doing things not related to today’s lab
- Leaving your backpack out on the lab bench or on the floor where people can trip over it (put your stuff on the benchtops by the windows)
- Being late, leaving early, or leaving the lab for prolonged periods
- Not turning in your assignment at the end of lab (lab goes for 2 hours 45 minutes)
- Leaving your workstation in disarray – you should leave it ready for the next lab section to come in and get started even if it was a mess when you came in.
- Engaging in any behavior that is distracting/disrespectful to students or to the instructor or that otherwise detracts from the learning environment.
- Making your lab partner do everything, or not allowing your lab partner to help with the activity.

Every student must pass the lab during the same semester as the lecture course. **It is required that you take and pass both the lab and the lecture in the same semester – if you fail either the lecture or the lab you will have to repeat the entire course (both lecture and lab)**

Physics 50 Lab, Fall 2019, Sections 11-35
regardless of your grade in the lecture.

There is also a workshop that is intended to give you some structured problem-solving time outside of the lecture and lab, where you can work with other students and the workshop facilitator. You are not required to take the workshop, in fact, these labs are different from the traditional lab in that we have restructured the lab exercises to have much more problem solving practice, similar to workshop.

You will be assigned a numerical lab grade (0-100) that will count toward about 25% (depends on your lecture instructor) of your overall final grade in the course. A lab grade of 70% or greater is required to pass the course, regardless of how the numbers work out for your overall grade. For example, if you get 60% in the lab and 90% in lecture, you will receive a D for the course, unfortunately. The key to doing well in lab is to actively participate in the experiments and in problem solving.

Your lab grade consists of ½ assignments, ¼ Pre-lab quizzes and ¼ participation:

*Assignments:* Each time your lab meets, there will be some kind of assignment to turn in before you leave. You lab will meet \( N = 13 \) or 14 times during the semester. Your lab grade will be the total of your assignments handed in, divided by \( N-1 \). Each assignment will be graded and will count toward your grade for that day. Please keep in mind that just showing up and doing the bare minimum on what is required will get you only 7/10 on any turned-in lab assignment. Work that is turned in on time, neatly written, and ethically conducted (meaning, you didn’t just copy stuff) will get you more than 7/10. Work that is particularly careless, sloppy or incomplete will get less than 7/10. “A” is not for “average”. The key to doing well in lab is to actively participate in the experiments and in problem solving sessions.

*Pre-Lab quizzes:* are 1/4 of the lab grade. You will have a 15- 20 min quiz at the beginning of each lab meeting. This quiz can be related to the experiment which is planned for that day or any related problem chosen by your instructor. During the first lab meeting, your lab instructor will provide more information about grading rules of these quizzes.

*Participation:* is also its own stand-alone grade, representing ¼ of your lab grade. Generally speaking, everyone starts with 100% in participation, and it is yours to lose by habitually engaging any of the “bad lab behaviors” listed above. Please keep in mind that just showing up and doing the bare minimum what is required will get you only 7/10 on any turned-in lab assignment.

**Electronic devices**
You may use calculators on all assignments (in-class, homework, and exams), unless otherwise specified. Please remember to keep your cell phones quiet (and stowed away!) during class. Please do not use your laptop computer during lab.

**Additional Help**
Please do not wait until you have fallen behind to seek help. Your lab instructor is your first line of defense from falling behind. Many students find tutoring helpful. Tutoring is available through Peer Connections and the College of Science Advising Center (CoSAC).

**Dropping and Adding**
Students are responsible for understanding the policies and procedures about add/drops, academic
renewal, etc. This information can be accessed at http://www.sjsu.edu/aars. There is no reason that anyone should be adding the course after the first day of class. Anyone who adds late and misses their first lab may count that as the one “free absence” of their lab (see attendance policy).

University Policies

Academic integrity

Students should know the University’s Academic Integrity policy. Your own commitment to learning, as evidenced by your enrollment at San Jose State University and the University’s integrity policy, require you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. For details, please see the website for Student Conduct and Ethical Development.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person’s ideas without giving proper credit) will result in a failing grade and sanctions by the University. If you would like to include in your assignment any material you have submitted, or plan to submit for another class, please note that SJSU’s Academic Policy F06-1 requires approval of instructors.

Common examples of academic integrity violations in this course include the following: 1) googling answers or other information with a smartphone during exams, 2) looking up the solutions to problems and then just plugging-and-chugging in the answers without the trial-and-error that is intrinsic to learning how to solve problems. These violations are very easy to spot (and to prove) and result in an F for the course, which cannot be repeated for grade forgiveness. Ultimately the question is this: are you getting points without being able to solve that problem on your own later? If the answer is yes, it’s considered cheating.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with the AEC (Accessible Education Center) to establish a record of their disability.
<table>
<thead>
<tr>
<th>Lab#</th>
<th>Dates</th>
<th>Topics and lab exercises</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aug 26-30</td>
<td>Measurement</td>
</tr>
<tr>
<td>2</td>
<td>Sep 3-9</td>
<td>Adding vectors</td>
</tr>
<tr>
<td>3</td>
<td>Sep 10-13</td>
<td>Projectile Motion Problem Set</td>
</tr>
<tr>
<td>4</td>
<td>Sep 16-20</td>
<td>Free-fall (Gravity) (Monday sessions will work on some of problems from Projectile Motion practices in addition to Free Fall Lab)</td>
</tr>
<tr>
<td>5</td>
<td>Sep 23-27</td>
<td>Newton’s Laws of Motion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Midterm 1 exam (Dr. Quan Sep 25, and Dr. Beyerstorf Sep 26)</td>
</tr>
<tr>
<td>6</td>
<td>Sep 30-Oct 4</td>
<td>Friction Lab</td>
</tr>
<tr>
<td>7</td>
<td>Oct 7-11</td>
<td>Friction II, Newton’s Law Problem set</td>
</tr>
<tr>
<td>8</td>
<td>Oct 14-18</td>
<td>Work and energy</td>
</tr>
<tr>
<td>9</td>
<td>Oct 21-25</td>
<td>Work and energy Problem Set</td>
</tr>
<tr>
<td>10</td>
<td>Oct 28-Nov 1</td>
<td>Review for Midterm 2</td>
</tr>
<tr>
<td>11</td>
<td>Nov 4-8</td>
<td>Ballistic Pendulum</td>
</tr>
<tr>
<td>12</td>
<td>Nov 12-18</td>
<td>angular momentum lab (Nov 11: Veterans Day Holiday)</td>
</tr>
<tr>
<td>13</td>
<td>Nov 19-25</td>
<td>Statics and equilibrium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nov 26-29 Thanksgiving Holiday</td>
</tr>
<tr>
<td>14</td>
<td>Dec 2-9</td>
<td>Final Review</td>
</tr>
</tbody>
</table>