

PHYS 2125: University Physics Lab I

Spring 2026

Course Information:

Course: PHYS 2125
Name: University Physics Lab II
Section: 001
Lab Meeting: Mondays at 6:00 PM
Location: ST 379

Instructor Information:

Name: Sai Madhav Modumudi
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Office: ST 379
Office hours: Fridays 9:30 to 11:00 AM
Online: Fridays by appointment

Course Description:

Over the past century, physics has undergone a revolutionary transformation through theories such as quantum mechanics and general relativity. These theories have expanded our understanding of the universe, from the smallest atomic scales to the largest cosmological ones. The application of these theories has significantly advanced other natural sciences and engineering disciplines, shaping innovations that impact our daily lives. For example, airplanes, MRI machines, satellites, metal detectors, smartphones and many other technological advancements would not exist without the underlying knowledge of the physical principles. Physics, therefore, serves an important purpose in modern science, technology and engineering. This course provides students enrolled in PHYS 2325 with a hands-on learning experience that highlights the essential relationship between theory and experimentation. Neither theory nor experiment stands alone: theoretical predictions guide the design of experiments, and experimental results inspire new theoretical models.

The course begins with a review of essential skills, including fundamental mathematics involving calculus, the use of lab equipment, and Excel for data analysis. Students will engage in a series of laboratory experiments focusing on core topics in mechanics, such as motion, forces and free-body diagrams, energy and momentum conservation including collisions, periodic motion, etc. Through these experiments, students will reinforce fundamental physics concepts while improving skills in scientific communication, collaboration, measurement techniques, uncertainty analysis, and error evaluation. In addition to technical proficiency, the course emphasizes broader scientific practices. Students will develop skills in critical thinking, problem-solving and scientific communication, all of which are essential for success in STEM fields. By uniting theoretical understanding with practical application, this course provides more than laboratory training it builds a strong foundation for future study in physics and related disciplines while demonstrating the power of physics to explain, predict, and shape the world around us.

Co-requisite: PHYS 2325. Prerequisite: TSI Reading/Writing/Math.

Course Objectives and Learning Outcomes:

1. Critical Thinking: Students will understand the use of logical discussion and analysis through one or more activities such as comparing multiple viewpoints and explaining the use of the scientific method.
2. Communication Skills: Students will understand the use of writing, oral, and visual literacy skills to communicate persuasively and exchange information appropriate to the subject, occasion, and audience.
3. Empirical & Quantitative Skills: Students will understand mathematical concepts and explain mathematical, technological, and quantitative tools for use in science and everyday life, resulting in informed conclusions.
4. Teamwork: Students will understand the use of teamwork skills for collaborative lab activities.
5. Learning outcomes: Upon successful completion of this course, students will demonstrate skills necessary to set up and perform experiments, collect data, and formulate conclusions from an experiment. Record experimental work completely and accurately and communicate experimental results clearly in written reports. Specifically, students will solve mechanics problems using energy conservation principles and understand simple harmonic motion. Additionally, students will also be able to quantitatively analyze experimental data using Excel, including graphing, fitting trends, estimating uncertainty, and evaluating error sources to support evidence-based conclusions.

Course Material:

There is no published laboratory manual or required textbook for this course. All lab write-ups and reading assignments will be available on Blackboard (<https://tamusa.blackboard.com>) prior to the lab date. Printed copies of the lab manual and report will be provided during the lab.

Requirements:

1. Attendance policy: Regular and punctual attendance is expected. Lab will start promptly at the appointed time. Your official record of your attendance is kept by your name and signature on the reports submitted. If you are unable to attend a lab either for personal reasons or due to an emergency, please let your instructor know by email as soon as possible.
2. Lab homework and/or Pre-Lab: Before you begin the experiment, read the theory part of the lab manual, and complete the online lab pre-lab, if assigned, on Blackboard. These homework assignments prepare you to maximize the learning during the lab and ensure that you are ready to start with the lab once it starts.
3. Lab Make-up: The penultimate lab session shall be reserved for making up at most two missed labs. If you know you are going to miss a lab, contact the instructor by email as soon as possible. Contact the instructor within 24 hours of the scheduled lab for emergency cases. Any missed lab counts as '0' unless the student has a valid documented excuse.

The following are considered excusable absences and require documentation to substantiate the claim of excused absence: US military functions, student sickness documented with a note from a doctor, a death

in the immediate family within 15 days of the class period documented with a note to the instructor at the time of the class session and then followed by an official notice of death when available, attending a university sponsored event.

Homework, Pre-Labs, and Lab Reports:

- Lab groups will generally consist of 3–4 students. Students would be allowed to choose their own group for each lab session. However, special considerations, such as limited lab equipment, might require that the instructor assign students to a specific group as needed. Each group submits one lab report for the whole group.
- A printed lab report shall be provided during the lab, and all answers must be written on the provided template. A completed lab report shall typically consist of the lab report and an Excel sheet uploaded to the link provided on Blackboard.
- **Lab reports are due at the end of the lab.** Example: If you perform a lab on Monday, March 3, from 8:00 to 10:45 AM, the lab report is due at 10:45 AM that day.
- Late labs will not be accepted and will be graded as a zero. The labs have been timed so that all the work can be done during the lab. The students are expected to come prepared to the lab by reading the lab material in advance. This is advised so that there shall be a few problems submitting lab reports on time and, in most cases, should not extend beyond the lab period.
- Pre-labs and homework are either assigned on Blackboard or Khan Academy and an announcement will be posted on Blackboard for each assignment. **Pre-labs are due before the lab starts, and homework is due one week from when they are assigned.**
- Group members are encouraged to exchange contact information. All students in the group are responsible for delivering the lab report to the instructor on time.
- A student who does not turn in 4 or more lab reports will receive an automatic ‘F’ in the lab course.
- Grade Rebuttals – If you think there was an error in grading you have one week to report it to your lab instructor from the time the graded work was returned to you. After this time, the grades are considered final.
- This course assumes that all work submitted by students will be generated by the students themselves, working individually or in groups. Students should not have another person/entity do the writing of any portion of an assignment for them, which includes hiring a person or a company to write assignments.

Technology Requirements:

Please contact the I.T. department (helpdesk@tamusa.edu or call (210) 784 4357) at TAMU-SA with any technology related questions. You will need a working computer/laptop, with Windows or Mac, or a Chromebook. You can bring your own laptop or use the one from the lab. The lab computer must first be connected to the internet and only after logging into your account, you can use it. To connect to the internet, use the Amazon ethernet cord and connect the computer to the ethernet port on any of the ports available near the wall of the lab. After logging into your account, you can disconnect and use the laptop at your lab table. You will need software to read/write/edit Excel and to read PDF documents. You will

also need a proper internet connection. A basic-level scientific calculator might be needed for the math review sessions. All other calculations in the course will be done in Excel. Excel records the calculation process as well as the answer and this allows the instructor to understand what you have done wrong if you don't have the right answer – something that is not possible with a calculator. You can also download RealCalc scientific calculator app from the app store and install it on your phone. This is a very user-friendly app, and I strongly recommend all of you to use this for all lab calculations.

Lab Rules and Expectations:

- Cell phones must be turned off and always put away.
- No food or drinks are allowed in the lab, unless a prior medical approval is obtained from the instructor.
- Students must clean and organize their work area before leaving the lab.
- Only students enrolled in the class are allowed in the lab room.
- You are not permitted to leave early unless given explicit permission from the lab instructor. The following lab may be previewed at the end of the current lab. The instructor will inform the class if it is permissible to leave early.
- Students are highly encouraged to ask the instructor to review their lab report and date prior to leaving the lab.
- Submission by email with a copy to all group members constitutes signing the lab report.

Lab safety and policies:

The instructor will discuss certain rules and safety guidelines particular to the Physics laboratory and will provide a hand-out at the beginning of the semester that the students must sign before proceeding. Please follow these policies for your own safety and a good lab experience. Any issue about broken, missing, or defective equipment must be brought to the attention of the lab instructor.

Course Schedule:

This is a tentative schedule. Some adjustments should be expected.

Session	Week of	Scheduled Lab
1	Jan 19—Jan 23	No Lab
2	Jan 26—Jan 30	Lab 1: Units, Dimensions and Measurement
3	Feb 2—Feb 6	Lab 2: Kinematics
4	Feb 9—Feb 13	Lab 3: Acceleration due to Gravity
5	Feb 16—Feb 20	Lab 4: Introduction to Vectors

6	Feb 23—Feb 27	Lab 5: Projectile Motion
7	Mar 2—Mar 6	Lab 6: Atwood's Machine
8	Mar 9—Mar 13	Spring Break—No Lab
9	Mar 16—Mar 20	Lab 7: Friction
10	Mar 23—Mar 27	Lab 8: Collisions
11	Mar 30—Apr 3	Lab 9: Rotational Motion
12	Apr 6—Apr 10	Lab 10: Conservation of Angular Momentum
13	Apr 13—Apr 17	Lab 11: SHM: Springs and Pendulums
14	Apr 20—Apr 24	Make-up Week
15	Apr 27—May 1	Lab 12: Self-experiment Session
16	May 4—May 8	No Lab

Grading:

1. Each lab has a variable number of raw points. Your grade is the percent score your lab group receives on the lab. Thus, each lab has a final score using a 100-point basis.
2. Each homework assignment or pre-lab will be between 20 and 50 points, and these are not scaled. Students will be allowed at least 1 week to complete all pre-labs and homework.
3. Students will not receive attendance credit if they are more than 20 minutes tardy to the lab.
4. Two math assessments are planned, as can be seen in the tentative schedule. Non-graded exercises may be used to evaluate learning, and help students cover any background material necessary.
5. Your current and final grade is based on the averages calculated in the table below.

Lab Report average	65%
Homework and Pre-Lab average	25%
Self-experiment session	10%
Total	100%

Letter Grade:

F = 0 – 59%	D = 60 – 69%	C = 70 – 79%	B = 80 – 89%	A = 90 – 100%
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University Email Policy and Course Communications

All correspondence between professors and students must occur via university email accounts. You must have your Jaguar email account ready and working. If it is not working, contact the help desk at helpdesk@tamusa.edu or at 210-784-HELP (4357). If you don't hear back within 48 hours, contact them again. They have many requests during the first part of the semester, so you may need to follow up with them.

Academic Accommodations for Individuals with Disabilities

Texas A&M University-San Antonio is committed to providing all students with reasonable access to learning opportunities and accommodations in accordance with The Americans with Disabilities Act, as amended, and Section 504 of the Rehabilitation Act. If you experience barriers to your education due to a disability or think you may have a disability, Disability Support Services is in the Central Academic Building, Suite 210. You can also contact us via phone at (210) 784-1335, visit us at the website or email us at dss@tamusa.edu. Disabilities may include, but are not limited to, attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their academic accommodation with Disability Support Services and their instructors as soon as possible.

Academic Learning Center

All currently enrolled students at Texas A&M University-San Antonio can utilize the Academic Learning Center for subject-area tutoring. The Academic Learning Center provides free course-based tutoring to all currently enrolled students at Texas A&M University-San Antonio. Students wishing to work with a tutor can make appointments through the Brainfuse online tutoring platform. Brainfuse can be accessed in the Tools section of Blackboard. You can contact the Academic Learning Center by emailing tutoring@tamusa.edu, calling (210) 784- 1307, or visiting the Central Academic Building, room 202. Online tutoring is also available for after hours and weekend assistance.

While tutoring hours may change based on tutor schedules and availability, the current tutoring hours for MATH in the ALC are as follows:

Day of the Week	Appointments Available	Walk-in Tutoring (no appointment needed)
Monday	8:00 AM – 6:00 PM	9:00 AM – 5:00 PM
Tuesday	8:00 AM – 6:00 PM	9:00 AM – 5:00 PM
Wednesday	8:00 AM – 6:00 PM	9:00 AM – 5:00 PM

Day of the Week	Appointments Available	Walk-in Tutoring (no appointment needed)
Thursday	8:00 AM – 6:00 PM	9:00 AM – 5:00 PM
Friday	8:00 AM – 5:00 PM	11:00 AM – 4:00 PM

Counseling/Mental Health Resources

As a college student, there may be times when personal stressors interfere with your academic performance and negatively impact your daily functioning. If you are experiencing emotional difficulties or mental health concerns, support is available to you through the Student Counseling Center (SCC). To schedule an appointment, visit our website, call 210-784-1331 or visit Madla 120 between the hours of 8:00 AM and 5:00 PM.

All mental health services provided by the SCC are free and confidential (as the law allows). The Student Counseling Center provides brief individual and group therapy, crisis intervention, consultation, case management, and prevention services. Crisis support is available 24/7/365 by calling the SCC at 210-784-1331 or through the TELUS student support App.

The [TELUS Student Support App](#) provides a variety of mental health resources to include 24/7/365 support for in the moment distress, crisis support, an anonymous peer-to-peer support network, mental health screenings, podcasts, and articles to improve your mental wellbeing.

Emergency Preparedness

JagE Alert is Texas A&M University-San Antonio's mass notification system. In the event of an emergency, such as inclement weather, students, staff and faculty, who are registered, will have the option to receive a text message, email with instructions and updates. To register or update your information visit the [Jag E Alert System website](#). You can access more information about [Emergency Operations Plan and the Emergency Action Plan on our website](#). Download the [SafeZone App](#) for emergencies or call (210) 784-1911. Non-Emergency (210) 784-1900.

Financial Aid and Verification of Attendance

According to the following federal regulation, 34 CFR 668.21: U.S. Department of Education (DoE) Title IV regulation, a student can only receive Title IV funds based on Title IV eligibility criteria which include class attendance. If Title IV funds are disbursed to ineligible students (including students who fail to begin attendance), the institution must return these funds to the U.S. DoE within 30 days of becoming aware that the student will not or has not begun attendance. Faculty will provide the Office of Financial Aid with an electronic notification if a student has not attended by the published Census Date (the first week of class). Any student receiving federal financial aid who does not attend prior to the published Census Date (the first week of class) will have their aid terminated and returned to the DoE.

Please note that any student who stops attending at any time during the semester may also need to return a portion of their federal aid.

Jaguar Writing, Language, and Digital Composing Center (WLDCC)

The Jaguar Writing Center provides writing support to graduate and undergraduate students in all three colleges as well as faculty and staff. Writing tutors work with students to develop reading skills, prepare oral presentations, plan, draft, and revise their written assignments. Our language tutors support students enrolled in Spanish courses and students composing in Spanish for any assignment. Our digital studio tutors support students working on digital projects such as e-portfolios, class presentations, or other digital multimedia projects.

The Writing Center offers face-to-face, synchronous online, and asynchronous digital appointments. Students can schedule appointments with the Writing Center in JagWire under the **Student Services tab**. Click on **Writing, Language, and Digital Composing Center** to make your appointment. Students wanting to work in real time with a tutor can schedule an **Online Appointment**. Students wishing to receive asynchronous, written feedback from a tutor can schedule an **e-Tutoring appointment**. More information about what services we offer, how to make an appointment, and how to access your appointment can be found on the [Writing Center's website](#). The Writing Center can also be reached by emailing: writingcenter@tamusa.edu.

Meeting Basic Needs

Any student who has difficulty affording groceries or accessing sufficient food to eat every day or who lacks a safe and stable place to live and believes this may affect their performance in the course, is urged to [submit a CARE report for support](#). Furthermore, please notify the professor if you are comfortable in doing so. This will enable them to direct you to available resources. The [General's Store is a food pantry](#) that is available on campus as well.

Military Affairs

Veterans and active-duty military personnel are welcomed and encouraged to visit the Office of Military Affairs for any question involving federal or state VA Education Benefits. Visit the Patriots' Casa building, room 202, or to contact the Office of Military Affairs with any questions at military.va@tamusa.edu or (210)784-1397.

Religious Observances

Texas A&M University-San Antonio recognizes the wide variety of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided with an opportunity to make up any examination, study, or course work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes for regular session classes.

The Six-Drop Rule

Students are subject to the requirements of Senate Bill (SB) 1231 passed by the Texas Legislature in 2007. SB 1231 limits students to a maximum of six (6) non-punitive course drops (i.e., courses a student chooses to drop) during their undergraduate careers. A non-punitive drop does not affect the student's GPA. However, course drops that exceed the maximum allowed by SB 1231 will be treated as "F" grades and will impact the student's GPA.

Statement of Harassment and Discrimination

Texas A&M University-San Antonio is committed to the fundamental principles of academic freedom, equal opportunity, and human dignity. To fulfill its multiple missions as an institution of higher learning, A&M-San Antonio encourages a climate that values and nurtures collegiality and the uniqueness of the individual on our campus and within our state, nation, and world. All decisions and actions involving students and employees are to be based on applicable law and individual merit. Texas A&M University-San Antonio, in accordance with applicable federal and state law, prohibits discrimination, including harassment, based on race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation, or pregnancy/parenting status. Individuals who believe they have experienced harassment or discrimination prohibited by this statement are encouraged to contact the University's Civil Rights Officer at 210-784-2061 or titleix@tamusa.edu. Texas A&M University-San Antonio faculty are committed to providing a safe learning environment for all students and for the university. If you have experienced any form of sex discrimination or harassment, including sexual assault, sexual harassment, domestic or dating violence, or stalking based on sex, know that help and support are available. A&M-San Antonio's Title IX Coordinator can support those impacted by such conduct in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, and more. The university strongly encourages all students to report any such incidents to the Title IX Coordinator. Please be aware that all A&M-San Antonio employees (other than those designated as confidential resources such as counselors and trained victim advocates) are required to report information about such discrimination and harassment to the university. This means that if you tell a faculty member about a situation of sexual harassment, sexual violence, or other related sex-based misconduct, the faculty member must share that information with the university's Title IX Coordinator (titleix@tamusa.edu, 210-784-2061, CAB 439K). If you wish to speak to a confidential employee who does not have this reporting requirement, you can contact the Student Counseling Center at (210) 784-1331 or visit them in Madla 120.

Pregnant/Parenting Students

Texas A&M-San Antonio does not require a pregnant or parenting student, solely because of that status or issues related to that status, to (1) take a leave of absence or withdraw from their degree or certificate program; (2) limit the student's studies; (3) participate in an alternative program; (4) change the student's major, degree, or certificate program; or (5) refrain from joining or cease participating in any course, activity, or program at the University. The university will provide reasonable accommodation for pregnant students as it would be provided to a student with a temporary medical condition that is related to the health and safety of the student and the student's unborn child. These could include maintaining a

safe distance from substances, areas, and activities known to be hazardous to pregnant individuals and their unborn child; excused absences because of illness or medical appointments; modified due dates for assignments; rescheduled tests/exams; taking a leave of absence; and being provided access to instructional materials and video recordings of lectures for excused absences, if these would be provided to any other student with an excused absence. Pregnant/parenting students are encouraged to contact the Title IX Coordinator with any questions or concerns related to their status (titleix@tamusa.edu; 210-784- 2061; CAB 439K).

Texas A&M-San Antonio has also designated the Title IX Coordinator as the liaison officer for current or incoming students who are the parent or guardian of a child younger than 18 years of age. The Title IX Coordinator can provide students with information regarding support services and other resources. Young Jaguars can support parenting students with daycare if students meet this criteria: (1) must be enrolled in classes at Texas A&M-San Antonio in the current semester, (2) must be Pell eligible or a single parent, (3) child(ren) must be aged 3 to 12-years-old, and (4) child(ren) must be enrolled in Pre-K-3 through 6th grade. For more information, please contact Young Jaguars at youngjaguars@tamusa.edu or call (210) 784-2636.

Students' Rights and Responsibilities

The following statement of students' rights and responsibilities is intended to reflect the philosophical base upon which University Student Rules are built. This philosophy acknowledges the existence of both rights and responsibilities, which is inherent to an individual not only as a student at Texas A&M University-San Antonio but also as a citizen of this country.

Students' Rights

1. A student shall have the right to participate in a free exchange of ideas, and there shall be no University rule or administrative rule that in any way abridges the rights of freedom of speech, expression, petition and peaceful assembly as set forth in the U.S. Constitution.
2. Each student shall have the right to participate in all areas and activities of the University, free from any form of discrimination, including harassment, on the basis of race, color, national or ethnic origin, religion, sex, disability, age, and pregnancy/parenting or veteran status in accordance with applicable federal and state laws.
3. A student has the right to personal privacy except as otherwise provided by law, and this will be observed by students and University authorities alike.
4. Each student subject to disciplinary action arising from violations of university students' rules shall be assured a fundamentally fair process.

Students' Responsibilities

1. A student has the responsibility to respect the rights and property of others, including other students, the faculty, and administration.

2. A student has the responsibility to be fully acquainted with the published University Student Rules found in the Student Handbook, Student Code of Conduct, on our website, and University Catalog, and to comply with them, as well as with federal, state, and local laws.
3. A student has the responsibility to recognize that student actions reflect upon the individuals involved and upon the entire University community.
4. A student has the responsibility to recognize the University's obligation to provide a safe environment for learning.
5. A student has the responsibility to check their university email for any updates or official university notifications.

Students are expected to exhibit a high level of honesty and integrity in their pursuit of higher education. Students engaging in an act that violates the standards of academic integrity will find themselves facing academic and/or disciplinary sanctions. Academic misconduct is any act, or attempt, which gives an unfair advantage to the student. Additionally, any behavior specifically prohibited by a faculty member in the course syllabus or class discussion may be considered as academic misconduct. For more information on academic misconduct policies and procedures please review the [Student Code of Conduct](#) or visit the resources available in the [OSRR website](#).

Important Spring 2026 Dates

Dates	Event
January 13	Tuition and Fee Payments deadline
January 19	Marting Luther King Jr. Day – No Classes
January 20	First Day of Class
February 4	Census Date
March 6-23	Midterm grading period
March 9-14	Spring Break
April 3	Study Day – No classes
April 17	Last day to drop with an automatic withdrawal
May 1	Last day to drop a course or withdraw from the university
May 4	Last Day of Classes
May 5	Study Day – No classes

Dates	Event
May 6-12	Final Exams
May 19	Commencement

The complete [Academic Calendar](#) as available on our website.

Artificial Intelligence Policy

No Use of Generative AI Permitted

This course assumes that all work submitted by students will be generated by the students themselves, working individually or in groups. Students should not have another person/entity do the writing of any portion of an assignment for them, which includes hiring a person or a company to write assignments and/or using artificial intelligence (AI) tools like ChatGPT. Use of any AI-generated content in this course qualifies as academic dishonesty and violates Texas A&M-San Antonio's standards of academic integrity.