

Point Loma Nazarene University
Department of Physics and Engineering
Fall 2025
PHY 1044/L General Physics I and Lab (3 + 1 units)
Class Meetings: MWF 7:25 AM – 8:20 AM (RS 265)
Final Exam Friday, December 19 at 10:30 am

Lab meetings: RS 265

Section 1 -- T 7:25 AM - 9:55 AM

Section 2 -- R 10:30 AM - 1:00 PM

Instructor: Dr. Paul D. Schmelzenbach
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Office hours: T 10-12; MWF 1:30-2:30 pm in RS258

PLNU Mission: To Teach ~ To Shape ~ To Send

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Department Mission

The Physics and Engineering Department at PLNU provides strong programs of study in the fields of Physics and Engineering. Our students are well prepared for graduate studies and careers in scientific and engineering fields. We emphasize a collaborative learning environment which allows students to thrive academically, build personal confidence, and develop interpersonal skills. We provide a Christian environment for students to learn values and judgment, and pursue integration of modern scientific knowledge and Christian faith.

General Education Mission: PLNU provides a foundational course of study in the liberal arts informed by the life, death, and resurrection of Jesus Christ. In keeping with the Wesleyan tradition, the curriculum equips students with a broad range of knowledge and skills within and across disciplines to enrich major study, lifelong learning, and vocational service as Christ-like participants in the world's diverse societies and culture.

Course Description: An analytic, calculus-based study of classical physics appropriate for science and engineering majors. Includes mechanics, waves, and thermodynamics. Lecture and laboratory. Letter grading.

Course Learning Outcomes

After completing this course, students can

1. translate the description of physics problems into the mathematical equations required to solve them using relevant physical principles.
2. calculate solutions to physics problems once appropriate equations or techniques are identified.
3. predict reasonable answers in appropriate problems, and assess the reasonableness of calculated answers
4. explain the physical meaning of the parameters in introductory physics equations create and interpret graphical representations of physical quantities (motion graphs, vectors, standing waves, etc.)
5. gather and interpret data in a lab setting

General Education Learning Outcomes: This course is one of the components of the Foundational Experience program at Point Loma Nazarene University, through which students will acquire knowledge of human cultures and the physical and natural world while developing skills and habits that foster life-long learning. Specifically, this course supports this [broader context](#) in developing GELO 1e. Quantitative Reasoning: Students will be able to solve problems that are quantitative in nature. Assessment of this learning outcome will be demonstrated on the final exam embedded in questions typical of introductory physics.

Required Texts and Materials

Physics: D. C. Giancoli, *Physics for Scientists & Engineers with Modern Physics*, 5th ed. (Pearson, 2022); Scientific Calculator, Access to Expert TA.

Course Credit Hour Information

In the interest of providing sufficient time to accomplish the stated course learning outcomes, this class meets the PLNU credit hour policy for a 4-unit class delivered over 15 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

Assessment and Grading: The grade you earn in this course is based on the scale below. The points you receive during the course are weighted accordingly:

(2%) Preclass: In preparation for each class meeting, there is a reading assignment. Class meetings are not a standard lecture format, making these reading assignments especially important. To complete the reading assignment, you must answer 2-3 short questions and submit them electronically by 10 pm the evening before class.

(20%) Lab: Hands-on experience of topics from class meetings is the focus of the lab, along with a focus on technique and data analysis. Labs will be performed in small groups, but everyone is responsible for submitting their own results. You must pass the lab portion of the class to pass the class.

(13%) Homework: Homework will be completed through ExpertTA. This work is very important in building your skills at solving physics problems.

(40%) Exams (4): Four exams will be given during the semester. Exams will include both multiple-choice or short answer conceptual questions, and problems to solve. Exams will be closed book, but a sheet of formulas will be provided. Partial credit will be given for correct reasoning at any step of a problem, but only if it is communicated clearly enough for me to understand.

(25%) Final exam: The final examination will be comprehensive, with a slight emphasis on the final material in the course.

Assessment and Grading: The grade you earn in this course is based on the scale below. The points you receive during the course are weighted accordingly:

A	B	C	D	F
92-100 (A)	87-89 (B+)	77-79 (C+)	67-69 (D+)	< 59
90-91 (A-)	83-86 (B)	73-76 (C)	63-66 (D)	
	80-82 (B-)	70-72 (C-)	60-62 (D-)	

Late Assignments: Preclass assignments earn half points if submitted late but before the start of class, after this they receive not credit. Electronic homework problems not submitted on time will receive a deduction of 1% per hour (note this is on a per problem basis, only the problem not turned in will receive this deduction). Typically labs will be submitted at the end of the lab period.

Exams and Missing Exam Policy:

Examinations and the Final Examination will include problems and questions over material assigned in the text, explored in homework, as well as material presented in class.

Distributed specific learning outcomes for the section, or for the entire class will provide a good means of study. A score of zero will be assigned for an examination that is missed without prior consent or a well-documented emergency beyond your control. If such an event arises, please ensure that you communicate with the professor as soon as possible so other arrangements can be made.

Final Exam

Successful completion of this class requires taking the final examination on its scheduled day. The final examination schedule is posted on the [Class Schedules](#) site. If you find yourself scheduled for three (3) or more final examinations on the same day, you are authorized to contact each professor to arrange a different time for one of those exams. However, unless you have three (3) or more exams on the same day, no requests for alternative final examinations will be granted.

Incomplete grade assignment: A grade of incomplete will only be assigned in extremely unusual circumstances. If you believe that your particular circumstances qualify be in clear communication with the professor as soon as you are able.

Artificial Intelligence (AI) Policy: You are allowed to use Large Language Models (like ChatGPT, NotebookLM, Claude, etc.) as a study tool, but not on any exams. Work that

utilizes AI-based tools should be identified as such including the tool used. Specific use cases will be clarified in class.

PLNU Academic Accommodations Policy

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities in accordance with the Americans with Disabilities Act (ADA). Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center (EAC@pointloma.edu or 619-849-2533). Once a student's eligibility for an accommodation has been determined, the EAC will work with the student to create an Accommodation Plan (AP) that outlines allowed accommodations. Professors are able to view a student's approved accommodations through Accommodate.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course. Accommodations are not retroactive so clarifying with the professor at the outset is one of the best ways to promote positive academic outcomes.

Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student's responsibility to make the first contact with the EAC. Students cannot assume that because they had accommodations in the past, their eligibility at PLNU is automatic. All determinations at PLNU must go through the EAC process. This is to protect the privacy of students with disabilities who may not want to disclose this information and are not asking for any accommodations.

Additional Course Information:

Additional PLNU policies and practices that apply to this course can be found at this [link](https://docs.google.com/document/d/11BgAANLOJ9tjt837d24EZ181ukM2qzHF/edit): <https://docs.google.com/document/d/11BgAANLOJ9tjt837d24EZ181ukM2qzHF/edit>

Lomabooks Instructions for Students: This course is part of our course material delivery program, LomaBooks. The bookstore will provide each student with a convenient package containing all required physical materials; all digitally delivered materials will be integrated into Canvas.

You should have received an email from the bookstore confirming the list of materials that will be provided for each of your courses and asking you to select how you would like to receive any printed components (in-store pick up or home delivery). If you have not done so already, please confirm your fulfillment preference so the bookstore can prepare your materials.

For more information about LomaBooks, please go: [here](#)

Date	Topic	Reading	Lab
9/03	Introductions		Measurements

Date	Topic	Reading	Lab
9/05	Units, Measures and Sig Figs	1.1-1.7	
9/08	1-D Motion: Velocity and Acceleration	2.1-2.5	1D Motion
9/10	1-D Motion: Free Fall and Problem Solving	2.6-2.7	
9/12	Vectors and Vector Operations	3.1-3.5	
9/15	Projectile and Relative Motion	3.6-3.9	2D Motion
9/17	Newton's Laws and Forces	4.1-4.6	
9/19	Free-Body Diagrams and Problem Solving	4.7-4.8	
9/22	Friction and Practice with Forces	5.1	Forces
9/24	Circular Motion	5.2-5.5	
9/26	Exam #1: Chapters 1-5		
9/29	Universal Gravitation; Satellites	6.1-6.4	Circular Motion
10/01	Kepler's Laws, and Gravitational Field	6.4-6.9	
10/03	Work and Kinetic Energy	7.1-7.4	
10/06	Conservative Forces and Potential Energy	8.1-8.5	Energy
10/08	Energy Conservation and Power	8.6-8.9	
10/10	Energy Wrap-up; Momentum and Impulse	9.1-9.4	
10/13	Collisions	9.5-9.7	Collisions
10/15	Center of Mass and Rocket Propulsion	9.8-9.10	
10/17	Exam #2: Chapters 6-9		
10/20	Angular Kinematics	10.1-10.3	
10/22	Torque and Rotational Dynamics	10.4-10.6	
10/27	Rotational Dynamics II	10.7-10.9	Rotation
10/29	Angular Momentum and Conservation	11.1-11.6	
10/31	Equilibrium	12.1-12.4	
11/03	Elasticity	12.5-12.6	Equilibrium
11/05	Fluid Statics: Pressure and Buoyancy	13.1-13.7	
11/07	Fluid Dynamics	13.8-13.12	
11/10	Exam #3: Chapters 10-13		Fluids
11/12	Simple Harmonic Motion and Energy	14.1-14.4	
11/14	Pendulums and Damped/Forced Oscillations	14.5-14.8	
11/17	Wave Properties and Superposition	15.1-15.4; 15.6	Standing Waves
11/19	Wave Phenomena: Interference and Standing Waves	15.7-15.11	

Date	Topic	Reading	Lab
11/21	Sound: Characteristics and Intensity	16.1-16.4	
11/24	Sound: Interference, Beats, and Doppler	16.5-16.9	No Lab
12/01	Temperature and the Ideal Gas Law	17.1-17.4; 17.6-17.9	Sound
12/03	Kinetic Theory of Gases	18.1-18.8	
12/05	Exam #4: Chapters 14-18		
12/08	Heat and the First Law	19.1-19.7	Ideal Gas
12/10	Specific Heats and Heat Transfer	19.8-19.10	
12/12	Heat Engines and Second Law	20.1-20.4	
Final Exam	Final Exam: Friday 7:30 am (Comprehensive, emphasis on 19-20)		