Department of Physic and Engineering

PHY2044 University Physics (3 units)

PHY2044L University Physics Lab (1 unit)

Fall 2026

Lecture: MWF 1:30 – 2:25 pm, Ryan Learning 206

Lab: Section 1 R 7:25 – 9:55 am; Section 2 R 1:30 – 4:00 pm, Rohr Science 295

Final Exam: Monday, 12/14, 1:30 – 4:00 pm, Ryan Learning 206

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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 Department of Physics & Engineering provides strong programs of study that aid in ensuring our students are well prepared for both graduate studies and careers in a variety of scientific and engineering fields. We emphasize a collaborative learning environment that allows students to thrive academically, build personal confidence, and develop interpersonal skills, while providing a Christian setting 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.

Program and Course Learning Outcomes

An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. (LO1)

General Education Learning Outcomes

For Foundational Exploration 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 cultures.

This course is one of the components of the General Education Program at Point Loma Nazarene University, in support of the general education learning outcome: Quantitative Reasoning: Students will be able to solve problems that are quantitative in nature. The purpose of general education is to provide a common educational experience, to develop essential skills, and to provide a broad cultural background for personal and professional growth. Within these broader outcomes, in this course you will:

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
5. create and interpret graphical representations of physical quantities
6. gather and interpret data in a lab setting

Required Texts and Recommended Study Resources

Physics for Scientists and Engineers, 5th Edition by Giancoli, Access to Expert TA, and a calculator

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

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:

(20%) Preparation and Practice

- Preclass (2%): 2–3 short questions on the reading in preparation for class, due 11:59pm the night before. The lowest 3 scores will be dropped.
- Homework (12%): through Expert TA
- Homework Check-ins (6%): a brief, closed-note check tied to that week's homework (roughly 5 minutes, in class). If you've done the homework, they should feel easy. The lowest two scores will be dropped.

(20%) Lab
Labs emphasize hands-on measurement, data interpretation, and construction. It is essential to not miss a lab, since it would be difficult to make up a lab without lab partners.

(40%) Exams
Three 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.

(20%) Final Exam
The final examination will be comprehensive, with a slight emphasis on the final section of material in the course.

A	**B**	**C**	**D**	**F**
A $S \geq 92$	B+ $90 > S \geq 88$	C+ $80 > S \geq 78$	D+ $70 > S \geq 68$	$S < 60$
A- $92 > S \geq 90$	B $88 > S \geq 82$	C $78 > S \geq 72$	D $68 > S \geq 62$	
	B- $82 > S \geq 80$	C- $72 > S \geq 70$	D- $62 > S \geq 60$	

Late Assignments
Preclass assignments earn half points if submitted late but before the start of class; after this they receive no credit. Homework problems not submitted on time will receive a deduction of 20% per day (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. No examination shall be missed without prior consent or a well-documented emergency beyond your control. 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 Examination Policy

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
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, by email or phone at 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 approved 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 approved accommodations in that

particular course. Accommodations are not retroactive; as such, 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-related need should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. In accordance with ADA, accommodations cannot constitute a fundamental alteration to course outcomes; therefore, planning ahead is vital in establishing appropriate accommodations for equal access to this course. 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 eligibility 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/1SoL5YMfCv_5cobhBwrDjbcZJzNKKTCfM/edit?usp=sharing&ouid=104297418648613020764&rtpof=true&sd=true

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 LomaBooks materials.

Course Calendar

Date	Topic	Reading	Lab (Thursdays)
M 08/31/26	Introduction		
W 09/02/26	Measurement, Estimating	1.1-1.7	Lab 1: Measurements & Uncertainty
F 09/04/26	Reference Frame, Displacement, Ave./Inst. Velocity, Acceleration	2.1 - 2.4	
M 09/07/26	***No Class: Labor Day***		
W 09/09/26	Motion at Constant Acceleration	2.5 - 2.6	Lab 2: Motion
F 09/11/26	Freely Falling Objects	2.7 - 2.7	
M 09/14/26	Vectors and Scalars	3.1 - 3.5	
W 09/16/26	Vector Kinematics, Projectile Motion	3.6 - 3.8	Lab 3: Forces
F 09/18/26	Force, Newton's First, Second, and Third Law	4.1 - 4.5	
M 09/21/26	Mass, Weight, Normal Force, Free-Body Diagram, Problem Solving	4.6 - 4.8	
W 09/23/26	Friction, Application of Newton's Laws	5.1 - 5.1	Lab 4: Frictional Forces
F 09/25/26	Catchup		
M 09/28/26	**Exam 1**		
W 09/30/26	Uniform Circular Motion; Banked and Unbanked Curve	5.2 - 5.4	Lab 5: Air Resistance
F 10/02/26	Newton's Law of Universal Gravitation; Satellite and Weightlessness	6.1 - 6.4	
M 10/05/26	Work, Kinetic Energy, Work-Energy Principle	7.1 - 7.4	
W 10/07/26	(Non)-Conservative Forces; Mechanical Energy Conservation	8.1 - 8.5	Lab 6: Conservation of Energy
F 10/09/26	Conservation of Energy; Escape Velocity; Power	8.5 - 8.8	
M 10/12/26	Momentum Conservation; Collision and Impulse	9.1 - 9.3	
W 10/14/26	Elastic and Inelastic Collisions	9.4 - 9.7	Lab 7: Conservation of Momentum
F 10/16/26	Center of Mass; Angular Quantities, Constant Angular Acceleration	9.8; 10.1 - 10.3	
M 10/19/26	Catch Up		
W 10/21/26	**Exam 2**		No Lab (Fall Break)
F 10/23/26	***No Class: Fall Break***		
M 10/26/26	Torque; Rotational Dynamics; Moment of Inertia	10.4 - 10.7	
W 10/28/26	Rotational Kinetic Energy, Rolling Motion (Exam 2?)	10.8 - 10.9	Lab 8: Rolling Motion
F 10/30/26	Angular Momentum and Its Conservation	11.1 - 11.3, 11.6	
M 11/02/26	Equilibrium, Stability and Balance	12.1 - 12.3	
W 11/04/26	Stress Strain and Fracture	12.4 - 12.6	Lab 9: Ruler Equilibrium
F 11/06/26	Static Fluids	13.1 - 13.7	
M 11/09/26	Fluid in Motion	13.8 - 13.10	
W 11/11/26	Simple Harmonic Motion	14.1 - 14.4	Lab 10: Fluid
F 11/13/26	Simple Harmonic Motion, Simple Pendulum	14.5, 14.6	
M 11/16/26	Damped and Forced Harmonic Motion, Resonance, Waves	14.7-8, 15.1 - 15.4	
W 11/18/26	Superposition, Reflection, Transmission, Interference, Standing Wave	15.5 - 15.9	Lab 11: Simple Harmonic Motion
F 11/20/26	Catch Up		
M 11/23/26	**Exam 3**		
W 11/25/26	***No Class: Thanksgiving***		No Lab
F 11/27/26	***No Class: Thanksgiving***		
M 11/30/26	Decibles, Sound in vibrating String and Air Columns	16.1 - 16.5	
W 12/02/26	Beats, Doppler Effect, Shock Waves and Sonic Boom	16.6 - 16.8	Lab 12: Musical Straws
F 12/04/26	Ideal Gas	Chapter 17	
M 12/07/26	Heat	Chapter 19	
W 12/09/26	Thermodynamics	Chapter 20	
F 12/11/26	Catch Up		
M 12/14/26	**Final Exam (1:30 - 4:00 pm)**		