Point Loma Nazarene University
Department of Physics and Engineering
PHY 1044/L General Physics II and Lab (3 + 1 units)

Fall Semester, 2023
Class meetings MWF: 8:30-9:25 Latter Hall 101 (LA 101)
Lab meetings (RS 265): Section 1 - M 6 pm; Section 2 - R 7:30 am; Section 3 - R 12:30
Final Exam: Mon, Dec 11: 7:30am - 10:00am

Instructor: Dr. Paul D. Schmelzenbach
Phone: 619.849.2933
Email: paulschmelzenbach@pointloma.edu
Office hours (RS 258): Tues & Thurs: 9-10am, 12:30-2pm. Other times available by appointment.

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.

Foundational Explorations 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
A general introduction to physics including mechanics, thermodynamics, waves and sound. The course is taught primarily at the algebra/trigonometry level but does require limited use of calculus. Meets the professional requirements of life and medical science majors. Lecture and laboratory. Not repeatable. 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

Foundational Experience & Course 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 FELO 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: Principles and Applications," 7th edition by Giancoli, Access to Expert TA ($35 access for the semester), 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: 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**
	B+ 87-89	C+ 77-79	D+ 67-69	F Less than 59
A 92-100	B 83-86	C 73-76	D 63-66	
A- 90-91	B- 80-82	C- 70-72	D- 60-62	

(2%) Preclass: In preparation for each class meeting, there is a reading assignment or activity. Class meetings are not in a standard lecture format, making these assignments especially important. To complete the reading assignment, answer three questions and submit them electronically by 10:00 pm the evening before a class meeting. Late submissions will not earn points.

(20%) Lab: The lab focuses on hands-on experiences of topics from class meetings, emphasizing technique and data analysis. Labs will be performed in small groups, but everyone is responsible for submitting their own results. Labs constitute 20% of your final grade. You must pass the lab portion of the class to pass the class.

(18%) Homework: Homework assignments will be completed through Expert TA. Practice is an extremely important part of developing your physics skills and understanding.

(40%) Exams (4): Four exams will be given during the semester. Exams will include both multiple-choice and short answer conceptual questions, as well as 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 an emphasis on the final material in the course.

Exams: Examinations, including the final examination, will cover topics explored in homework, class, and lab. The specific learning outcomes distributed for each section will serve as a valuable study guide.

Late Assignments and Exam Policy:

- Examinations: No examination should be missed without prior consent or a well-documented emergency beyond your control. A score of zero will be assigned for any examination missed without prior consent or a documented emergency.
- Preclass Assignments: These cannot earn points if submitted late.
- Homework: Problems not submitted on time will receive a 20% deduction per day (on any problem not submitted)
- Labs: These are typically submitted at the end of the lab period. Arrangments for a missed lab (such as due to an emergency) will need to made with the lab instructor.

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
Incompletes 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.

State Authorization
State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma Nazarene University is not authorized to enroll online (distance education) students. If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state. It is the student's responsibility to notify the institution of any change in his or her physical location. Refer to the map on State Authorization to view which states allow online (distance education) outside of California.

Course AI policy
Emerging technologies, such as large language models (e.g., ChatGPT), are intriguing and potentially beneficial. However, their pedagogical impact on physics learning outcomes remains somewhat untested. Any work that employs AI-based tools must be clearly identified, including the specific tool(s) used and relevant details. This policy will be further elucidated with examples during class if the need arises. Please be aware that AI policies may differ among classes this semester.

PLNU Copyright Policy
Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

PLNU Academic Honesty Policy
Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See Academic Policies. for definitions of kinds of academic dishonesty and for further policy information.

PLNU Academic Accommodations Policy
PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. 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 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will issue an academic accommodation plan ("AP") to all faculty who teach courses in which the student is enrolled each semester.

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 and/or if they do not wish to utilize some or all of the elements of their AP in that course.

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.

PLNU Attendance and Participation Policy
Regular and punctual attendance at all class sessions is considered essential to optimum academic achievement. If the student is absent for more than 10 percent of class sessions, the faculty member will issue a written warning of de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive an "F" grade.

Class Enrollment:
It is the student's responsibility to maintain his/her class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), the student has the responsibility to follow through (provided the drop date meets the stated calendar deadline established by the university), not the instructor. Simply ceasing to attend this course or failing to follow through to arrange for a change of registration (drop/add) may easily result in a grade of F on the official transcript.

Sexual Misconduct and Discrimination

In support of a safe learning environment, if you (or someone you know) have experienced any form of sexual discrimination or misconduct, including sexual assault, dating or domestic violence, or stalking, know that accommodations and resources are available through the Title IX Office at pointloma.edu/Title-IX. Please be aware that under Title IX of the Education Amendments of 1972, faculty and staff are required to disclose information about such misconduct to the Title IX Office.

If you wish to speak to a confidential employee who does not have this reporting responsibility, you can contact Counseling Services at counselingservices@pointloma.edu or find a list of campus pastors at pointloma.edu/title-ix.

Spiritual Care
Please be aware PLNU strives to be a place where you grow as whole persons. To this end, we provide resources for our students to encounter God and grow in their Christian faith. If students have questions, a desire to meet with the chaplain or have prayer requests you can contact the Office of Spiritual Development Links to an external site.

Topics and Assignments at a glance:

Date	Topic	Reading
8/28	Introductions	None

Date	Topic	Reading
8/30	Units, Measures and Estimating	1-1 to 1-8
9/1	Displacement, Velocity, Acceleration	2-1 to 2-4
9/6	Acceleration and Problem Solving	2-5 to 2-6
9/8	Falling Objects and Graphing	2-7 to 2-8
9/11	Vectors: Graphical and Components	3-1 to 3-4
9/13	Projectile Motion	3-5 to 3-7
9/15	Relative Motion and Vector Practice	3-8
9/18	Wrap up and Review	
9/20	Exam #1 (Chapters 1-3)	None
9/22	Newton's Laws; Weight	4-1 to 4-6
9/25	Forces Practice	4-7 to 4-8
9/27	Uniform Circular Motion	5-1 to 5-3
9/29	Gravitation; Types of Forces	5-5 to 5-10
10/2	Work and Energy	6-1 to 6-5
10/4	Energy Conservation	6-6 to 6-7
10/6	Energy Conservation; Power	6-8 to 6-10
10/9	Introduction to momentum; Review	7-1 to 7-3
10/11	Exam #2 (Chapters 4-6)	None
10/13	Collisions; Center of Mass	7-4 to 7-8
10/16	Angular Quantities	8-1 to 8-3
10/18	Torque and Rotational Dynamics	8-4 to 8-6
10/23	Rotational Energy and Momentum	8-7 to 8-9
10/25	Equilibrium	9-1 to 9-3
10/27	Balance; Stress Strain and Fracture	9-4 to 9-6
10/30	Wrap up and Review	
11/1	Exam #3 (Chapters 7-9)	None
11/3	Static Fluids	10-1 to 10-7
11/6	Fluids in Motion	10-8 to 10-10
11/8	Simple Harmonic Motion	11-1 to 11-6
11/10	Harmonic Motion and Waves	11-7 to 11-12
11/13	Sound waves	12-1 to 12-5
11/15	Interference and the Doppler Effect	12-6 to 12-9
11/17	Wrap up and Review	
11/20	Exam #4 (Chapters 10-12)	
11/27	Temperature	13-1 to 13-4

Date	Topic	Reading
11/29	Ideal Gas; Kinetic Theory	13-6 to 13-10
12/1	Heat; Specific Heat	14-1 to 14-4
12/4	Latent Heat; Heat transfer	14-5 to 14-8
12/6	Thermodynamics	15-1 to 15-4
12/8	Heat Engines; Basic Entropy	15-5 to 15-6