

**Point Loma Nazarene University**  
**Department of Physics and Engineering**  
**PHY1044: General Physics and Lab (3 + 1 units)**  
**MTWR 9:55-12:05; MTW 1:00-2:50 in LA02**  
**Summer Session I 2022: May 9-Jun 10**

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Instructor: Dr. Paul D. Schmelzenbach

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Office hours: MTWR 9:15-9:45; 12-1; 3-4; Appointment as needed via zoom

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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 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.

### **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**

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.

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 goals, this course develops students skills so they will be able to:

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 (motion graphs, vectors, standing waves, etc.)
6. gather and interpret data in a lab setting

## **REQUIRED TEXTS AND RECOMMENDED STUDY RESOURCES**

- Physics by Douglas Giancoli, 7th edition
- 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 5 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:

**(5%) Preclass:** In preparation for each class meeting there is a reading assignment. Because class meetings are not a standard lecture format, these reading assignments are especially important. In addition, the summer session is quite compressed, and it is imperative to come prepared to class. To complete the reading assignment, you must answer three questions and submit them electronically by 8:00 a.m. the before class. Late submissions will not be accepted. This electronic communication is so important because it is your voice in what material we emphasize during class meetings and provides me constant feedback on your understanding of the material. These submissions will be graded on the following scale: 2=demonstrates reading, 1=room for improvement, 0=unsatisfactory. These points are accumulated and are worth 5% of the final grade.

**(20%) Lab:** Hands-on experience of topics from class meetings are the focus of 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. Labs are worth 20% of your final grade. You must pass the lab portion of the class to pass the class.

**(15%) Homework:** Most days there will be homework due, homework is worth 15% of your final grade. Practicing working physics problems is critical to your success in the class. In summer school, you simply can't be behind so late homework will not be accepted for credit.

**(35%) Exams (3):** Three exams will be given during in-semester on May 17, May 25, and June 6. 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 to you to use during your exam. 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. For problems that call for a solution or explanation, no credit will be given for an answer alone; the method or reasoning must also be shown.

**(25%) Final exam:** The final exam is Thursday June 9 at 7:30-10:00 am. The final examination will be comprehensive with an emphasis on the final material in the course.

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

## Exams

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

## Final Exam

The final exam date and time is set by the university at the beginning of the semester and may not be changed by the instructor. This schedule can be found on the university website and in the course calendar. No requests for early examinations will be approved. Only in the case that a student is required to take three exams during the same day of finals week, is an instructor authorized to consider changing the exam date and time for that particular student.

## Incompletes and Late Assignments

Late assignments are not accepted for credit. A grade of incomplete will only be assigned in extremely unusual circumstances.

## **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](mailto: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.

## **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

## **PLNU Attendance and Participation Policy**

Attendance is expected at each class session. In the event of an absence you are responsible for the material covered in class and the assignments given that day. Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in 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 the appropriate grade for their work and participation. See [Academic Policies site](#). in the Undergraduate Academic Catalog. If absences exceed these limits but are due to university excused health issues, an exception will be granted.

## **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.

## **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	HMK DUE	LAB
5/09	Introduction and Motion	1-1 to 1-8		Lab 1: Measurements
5/10	Motion in 1-D	2-1 to 2-7	Hmk01	Lab 2: Falling Objects; Motion
5/11	Motion in 2-D ; Vectors	3-1 to 3-6	Hmk02	Lab 3: Force Vectors
5/12	Forces Part I	4-1 to 4-6	Hmk03	
5/16	Forces Part II	4-7 to 4-9	Hmk4a	Lab 4 - Frictional Forces
5/17	Exam #1; Circular Motion	5-1 to 5-3; 5-6 to 5-8	Hmk4b	Lab 5 - Circular Motion
5/18	Energy	6-1 to 6-8	Hmk05	Lab 6 - Energy
5/19	Energy and Momentum	6-8 to 6-10; 7-1 to 7-3	Hmk06	
5/23	Momentum; Rotation I	7-4 to 7-8; 8-1 to 8-4	Hmk07	Lab 7 - Rotation I
5/24	Rotational Motion II	8-5 to 8-8	Hmk8a	Lab 8 - Rotation II
5/25	Exam #2		Hmk8b	Equilibrium Lecture
5/26	Lab 9 - Equilibrium	9-1 to 9-6	Hmk09	
5/30	Memorial Day: No class meeting			
5/31	Fluids	10-1 to 10-10		Lab 10 - Buoyancy
6/01	Harmonic Motion and Waves	11-1 to 11-13	Hmk10	Lab 11 - SHO
6/02	Sound	12-1 to 12-7	Hmk11	
6/06	Exam #3; Kinetic Theory	13-1 to 13-10	Hmk12	Lab 12 - Sound
6/07	Kinetic Theory and Heat	14-1 to 14-8	Hmk13	Lecture
6/08	Thermodynamics	15-1 to 15-5	Hmk14	Lab 13 -

