Point Loma Nazarene University
Department of Physics and Engineering
PHY 1054/L General Physics II and Lab (3 + 1 units)
Class meetings: LA 101 MWF 7:25 AM - 8:20 AM
Final Exam: Wednesday, May 7, 7:30-10:00 a.m.

Lab meetings: RS 265
Section 1 - José Manjarrés - T 7:25-9:10
Section 2 - José Manjarrés - T 10:00-11:45
Section 3 - Michelle Chen - T 12:30-2:15

Instructor: Dr. Paul D. Schmelzenbach
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Office hours: 9-10 am; 3-4 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
A general introduction to physics including electricity and magnetism, optics, and modern physics. 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.

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
5. create and interpret graphical representations of physical quantities (electric fields, ray diagrams etc.)
6. 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 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; 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. Additionally, the summer session is quite compressed, making it imperative to come prepared to class. To complete the reading assignment, you must answer three questions and submit them electronically by 10:00 pm the evening before class. Late submissions will not be accepted.

(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. Labs constitute 20% of your final grade. You must pass the lab portion of the class to pass the class.

(18%) Homework: Homework will be completed through ExpertTA. This work is very important in building your skills at solving physics problems.

(35%) 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. Homework problems not submitted on time will receive a deduction of 20%per day. 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 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 assginement
A grade of incomplete will only be assigned in extremely unusual circumstances. If you believe that your parituclar circumstances qualify be in clear communication with the professor as soon as you are able.

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 619-849-2486). 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. The EAC makes accommodations available to professors at the student's request.

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 special accommodations.

Additional Course Information:

Additional PLNU policies and practices that apply to this course can be found at this link

Calendar:

Date	Topic	Reading	Hmk Due
1/13	Introductions		
1/14	No Lab meeting		
1/15	Intro to Charge and Coulomb's Law	16.1-16.6	
1/17	Coulomb's Law and the E field	16.6-16.8	
1/21	Lab 1: Electric field sim		
1/22	The Electric Field II and Practice	16.9	
1/24	Electric Potential	17.1-17.5	Hmk 16
1/27	V; Capacitance	17.7-17.10	
1/28	Lab 2: Equipotential Map		
1/29	Electric Currents I	18.1-18.4	Hmk 17

Date	Topic	Reading	Hmk Due
1/31	Electric Currents II: Power and AC	18.5-18.7	
2/03	Wrap up and Review		Hmk 18
2/04	Lab 3: Resistivity		
2/05	Exam 1: Chapters 16-18		
2/07	Circuits I	19.1-19.3	
2/10	Circuits II	19.3-19.4	
2/11	Lab 4: Circuits		
2/12	Circuits III	19.5-19.8	
2/14	Magnetic Fields and Forces I	20.1-20.4	Hmk 19
2/17	Magnetic Fields and forces II	20.5-20.10	
2/18	Lab 5: Slinky B-field		
2/19	Induction	21.1-21.4	Hmk 20
2/21	EMF, Generators, and Transformers	21.5-21.7	
2/24	EM waves	22.1-22.7	
2/25	Lab 6: Motors		
2/26	Wrap up and Review		Hmk 21-22
2/28	Exam 2: Chapters 19-22		
3/03	Geometric Optics: Mirrors	23.1-23.3	
3/04	Lab 7: Optics		
3/05	Geometric Optics: Lenses	23.4-23.8	
3/07	Dispersion and Interference	24.1; 24.3-24.4	Hmk 23
3/17	Diffraction Gratings	24.5-24.7	
3/18	Lab 8: Diffraction		
3/19	Thin Film, Polarization, atmosphere	24.8, 10, 12	
3/21	Cameras, Eyes, and Magnifiers	25.1-25.3	Hmk 24
3/24	Optical Instruments	25.4-25.9	
3/25	Lab 9: Optical Applications		
3/26	Relativity Part 1	26.1-26.4	Hmk 25
3/28	Relativity Part 2	26.5-26.11	
3/31	Wrap-up and Review		Hmk 26
4/01	Lab 10: Relativity Worksheet		
4/02	Exam 3: Chapters 22-26		
4/04	Early Quantum Theory	27.1-27.4	
4/07	Waves and Particles	27.6-27.10	
4/08	Lab 11: H spectra		

Date	Topic	Reading	Hmk Due
4/09	Spectra and Bohr Model	27.11-27.13	
4/11	QM and Uncertainty	28.1-28.6	Hmk 27
4/14	QM; Uncertainty	28.6-28.8	
4/15	Lab: Make-up		
4/16	Radioactivity and decay I	30.1-30.7	Hmk 28
4/22	Lab 12: Intro to Radioactivity		
4/23	Radioactivity and decay II	30.8-30.11	
4/25	Wrap up and Review		Hmk 30
4/28	Exam 4: Chapters 27-28; 30		
4/29	Lab 13: Wrap-up		
4/30	Fission and Fusion	31.1-31.3	
5/02	Effects and Uses of Radiation	31.4-31.5; 31.9	Hmk 31
5/07	Final W 7:30-10:00 a.m.		