

Department of Physics and Engineering, Point Loma Nazarene University
PHY 475 – Senior Project I – 2 Units

Fall 2021

Professor: Dr. Michelle Chen
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Office Hours: by appointment

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Lecture: MW 12:15 – 1:10 pm, RS365

Final Exam (Presentation): Wednesday 10:30 am – 1:00 pm Dec. 15, 2021.

Course Description: This course provides students the opportunity to prepare a technical paper on scientific or engineering research and to make an oral presentation of their results of this research. Initially topics investigated will draw on learning from the core curriculum, including topics in an advanced laboratory setting in mechanics, quantum mechanics, statistical mechanics, and electricity and magnetism. Students will then develop and explore a project of their choosing. This course will normally be completed in a student's senior year.

Learning Outcomes: This course supports the overall learning objectives of the physics and engineering programs to: design and conduct experiments or complete engineering design projects as well as analyze and interpret data and effectively communicate complicated technical information. Within these broader outcomes, in this course you will

1. Use data analysis and error analysis techniques within lab experiments.
2. Employ proper techniques to minimize uncertainty and eliminate systematic errors in experiments.
3. Use knowledge from operational manuals to correctly use advanced equipment.
4. Present data effectively in written and oral formats.
5. Create near-publication-quality manuscripts in LaTeX.
6. Design and carry-out an experimental investigation.
7. Appraise manuscripts of peer investigations.
8. Make an effective presentation at a level appropriate to a technical meeting.
9. Respond effectively to technical questions about their investigation.

ASSESSMENT AND GRADING

Progress: In-Class and Take-Home Tasks: There will be assignments assigned on CANVAS. They are meant to keep you on track for your project. No late assignment will be accepted.

Final Paper: You will write a publication quality paper on your project.

Final Presentation: You will present your project with your group during final exam time. **Final Examination Policy:** Successful completion of this class requires taking the final examination **on its scheduled day (Wednesday May 1, 2019, 10:30 am – 1:00 pm).**

Grading: The points you receive during the course are weighted accordingly:

Progress: In-class and Take-Home Tasks	50 %
Final Paper	25 %
Final Presentation	25 %

The grade you earn in this course is based on the following scale:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-
S \geq 91.0	91.0 >S \geq 89.5	89.5 >S \geq 87.5	87.5 >S \geq 81.0	81.0 >S \geq 79.5	79.5 >S \geq 77.5	77.5 >S \geq 71.0	71.0 >S \geq 69.5	69.5 >S \geq 67.5	67.5 >S \geq 61.0	61.0 >S \geq 57.0

A final grade will be given ONLY AFTER you remove and clean up your setup in the building!

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.

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 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 the appropriate grade for their work and participation.

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](#).

Final Exam: Date and Time: 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.

Credit Hour: In the interest of providing sufficient time to accomplish the stated course learning outcomes, this class meets the PLNU credit hour policy for a 2 unit class delivered over 15 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

Tentative Course Calendar

Date	In Class	Items Due	Project
Wk 01 08/31 – 09/03	Introductions		Initial Thoughts
Wk 02 09/07 – 09/10	Discuss Initial Ideas	Initial Ideas	Think/Develop/Discuss Talk with Professors
Wk 03 09/13 – 09/17	Present Proposal and Timeline/ Peer Review Proposal	Draft of Proposal and Timeline Due	Gather Supplies and Construct Project
Wk 04 09/20 – 09/24	Work on Project / Discuss with Professors and Peers	Briefly Discuss Progress and Challenge	Work on Project
Wk 05 09/27 – 10/01	Work on Project/Discuss with Professors	Briefly Discuss Progress and Challenge	Work on Project
Wk 06 10/04 – 10/08	Peer Review Progress Report	Progress Report Due	Work on Project
Wk 07 10/11 – 10/15	Progress Talk / Show & Tell / Peer Review	Show Project & Discuss Progress	Work on Project
Wk 08 10/18 – 10/22			
Wk 09 10/25 – 10/29	Review Topics		Work on Project
Wk 10 11/01 – 11/05			Work on Project
Wk 11 11/08 – 11/12			Work on Project
Wk 12 11/15 – 11/19	Peer Review the Papers	Submit Paper Draft	Finalize Project & Paper

Wk 13 11/22 – 11/26	Thanksgiving		Finalize Project & Paper Work on Presentation
Wk 14 11/29 – 12/03			Work on Presentation and Paper
Wk 15 12/06 – 12/10	Practice Talk	Final Paper Due	Work on Presentation and Paper
Wk 16 12/13 – 12/17	Final Presentation		