



Department of Physics and Engineering

EGR4082-1 / PHY4082-1 – Senior Project II

2 Units

Spring 2024

Meeting days/times: Wednesdays, 6:00-7:50 PM

Meeting location: RS 365

Final Exam: TBD¹

Instructor title and name:	Professor Jon Viducich, P.E.
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Office location and hours:	Via Zoom, by appt. (Please email the instructor to schedule.)

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.

Physics and Engineering 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

¹ Please note that the final exam will *not* take place during the university-scheduled final exam date/time for this course, due to the need to facilitate program requirements for faculty and community member attendance. I will confirm a substitute date/time with students and faculty during the first week of class and an updated version of this syllabus with the final date/time and location will be posted in Canvas.

environment for students to learn values and judgment and pursue integration of modern scientific knowledge and Christian faith.

Course Description

This course provides students (teams) with the opportunity to hone and finish building the project design initiated in EGR4072. The students will prepare a scientific paper about their research/project and give an oral presentation of their findings. This course will normally be completed in a student's senior year.

Program and Course Learning Outcomes

As part of this course, students will:

1. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Explore ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and social contexts.
3. Effectively manage time to complete project deliverables on schedule.
4. Communicate effectively with a range of audiences.
5. Gain experience with the peer-review process.

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 2-unit class delivered over 15 weeks. It is anticipated that students will spend a minimum of 37.5 participation hours per credit hour on their coursework. For this course, students will spend an estimated minimum 75 total hours meeting the course learning outcomes.

Assessment and Grading

This course seeks to prepare students for their engineering careers through self-directed, project-based learning, with an emphasis on professionalism. By completing an engineering design project with minimal oversight, students will continue to develop the skills they will need to be successful in a professional setting. As such, assigned grades will reflect the approximate quality, completeness, and timeliness of deliverables expected of an entry-level, junior engineer.

Graded components of the course include the following:

- **Class and Team Participation:** Because of the collaborative, project-based nature of this course, participation in class and team activities comprises a substantial portion of the overall course grade. A single participation grade will be assigned to each student by the instructor at the end of the term to reflect the student's participation throughout the course. Students are expected to arrive on time and prepared for each class session's planned activities. Most weeks, this will include a brief, informal oral progress report by each project team to describe progress made and to solicit feedback from the instructor and peers. Some weeks, class time will be dedicated to peer review of draft documents (e.g., proposals, reports, etc.). Students are expected to support each other in the learning process by asking thoughtful questions and providing constructive and respectful written and oral feedback during class sessions. Note that class participation activities are designed to directly benefit students by supporting them in the on-time delivery of excellent projects. Teams are expected to develop and commit to a team contract outlining expectations for all members, then honor those commitments throughout the semester. Each student's contribution to the project and adherence to the team contract will be evaluated based in part on team evaluations completed at the end of the semester.
- **Prototype Testing Proposal:** At the start of the term, the class will prepare a combined prototype testing proposal outlining the detailed testing protocols, planned analyses, and schedule. Each project team will be responsible for one or more sections. The draft proposal will be peer-reviewed during class time and feedback from peers and the client must be incorporated in the final version. By formally defining the testing plan, this document will help students set appropriate goals and ensure the timely delivery of prototype designs to the client. Grading for the assignment will be based on the completeness, quality, and on-time submittal of both the draft and final versions.
- **Progress Report:** Each project team will prepare a written, formal progress report, due on Week 7 of the term. The progress report will give students an opportunity to formally evaluate and present their progress, practice their technical writing skills, and continue to become familiar with a tool frequently used in industry. Detailed feedback was provided on the progress reports submitted during the Fall Semester; these comments should be incorporated to reflect learning and improvement. Grading for the assignment will be based on the completeness, quality, and on-time submittal of the reports.
- **Solar Dryer Manual:** Following the deployment of the prototypes in Guatemala during spring break, each project team will develop a manual documenting the design, construction, and use of their prototype. This documentation will allow the client to operate, replicate, and continue optimizing the designs in the future. Grading for the assignment will be based on the completeness, quality, and on-time submittal of both the draft and final versions and the comment responses.

- **Final Report:** The class will prepare a publication-quality report, due on the last day of the regular term, describing the work completed over the course of the year. Each project team will be responsible for drafting one or more sections. The draft-final report sections will be peer-reviewed during class time and the final version of the combined report will be submitted together with formal responses to the comments. Grading for the assignment will be based on the completeness, quality, and on-time submittal of both the draft and final versions and the comment responses.
- **Final Presentation:** The class will present the work completed over the course of the year during the final exam session. (Please carefully note the date and time for the final presentations.) Each project team will be responsible for presenting their work as part of the presentation. Students will have an opportunity to practice the final presentation in class during the last week of the regular term and receive feedback, though only the final presentation will be graded. The presentations will be open to PLNU students, faculty, and professional community members to attend. Grading for the assignment will be based on formal evaluation of both the presentation visuals (e.g., slides) and oral delivery, including appropriate responses to audience questions.

The grading distribution will be as follows:

Graded Component	Percentage of Grade
Class and Team Participation	20
Prototype Testing Proposal	15
Progress Report	10
Prototype Manual	15
Final Report	20
Final Presentation	20
Total	100

Final grades will be assigned based on the number of points accumulated throughout the course as a percentage of the total points possible. The percentage ranges required to obtain a given grade are:

Standard Grade Scale Based on Percentages					
	A	B	C	D	F
+		87.5-90	77.5-80	67.5-70	
	92.5-100	82.5-87.5	72.5-77.5	62.5-67.5	0-60
-	90-92.5	80-82.5	70-72.5	60-62.5	

Final Examination Policy

Successful completion of this class requires participation in the final examination on its scheduled day. 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. Given the need to facilitate faculty and community member attendance for program requirements, any students with concerns about the scheduled final examination time must contact the instructor during the first week of the term. Unless you have three (3) or more exams on the same day, and after the first week of the term, no requests for alternative final examination times will be considered.

Incompletes and Late Assignments

All assignments are to be submitted by the due dates. Assignments will be considered late if submitted after the indicated due date and time. Late assignments will receive a grade of 0, except in extremely unusual circumstances and at the instructor's discretion. Note: If, due to extreme circumstances, students foresee that they will not be able to submit an assignment on time, they must inform the instructor and discuss options as early as possible. Extensions will not be considered when failure to meet a deadline is coupled with poor communication.

PLNU Attendance and Participation Policy

Regular and punctual attendance at all class sessions is considered essential to optimum academic achievement, and the ability to arrive on time is a critical professional skill. While tardiness is sometimes unavoidable, any student arriving late to class more than twice during the semester will receive no class participation credit for subsequent class sessions during which they arrive late, at the instructor's discretion. If a 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 withdrawal date or, after that date, receive an “F” grade.

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 your professor or the [Office of Spiritual Life and Formation](#).

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 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.

Artificial Intelligence (AI) Policy

You are allowed to use Artificial Intelligence (AI) tools (e.g, ChatGPT, iA Writer, Marmot, Botowski) to generate ideas, but you are not allowed to use AI tools to generate content (text, video, audio, images) that will end up in any work submitted to be graded for this course. Please discuss any questions about the use of AI with the instructor.

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.

Language and Belonging

Point Loma Nazarene University faculty are committed to helping create a safe and hospitable learning environment for all students. As Christian scholars we are keenly aware of the power of language and believe in treating others with dignity. As such, it is important that our language be equitable, inclusive, and prejudice free. Inclusive/Bias-free language is the standard outlined by all major academic style guides, including MLA, APA, and Chicago, and it is the expected norm in university-level work. Good writing and speaking do not use unsubstantiated or irrelevant generalizations about personal qualities such as age, disability, economic class, ethnicity, marital status, parentage, political or religious beliefs, race, gender, sex, or sexual orientation. Inclusive language also avoids using stereotypes or terminology that demeans persons or groups based on age, disability, class, ethnicity, gender, race, language, or national origin. Respectful use of language is particularly important when referring to those outside of the religious and lifestyle commitments of those in the PLNU community. By working toward precision and clarity of language, we mark ourselves as serious and respectful scholars, and we model the Christ-like quality of hospitality.

You may report an incident(s) using the [Bias Incident Reporting Form](#).

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.

Tentative Course Schedule

Please note the schedule is subject to change throughout the semester; refer to the Canvas course home page for the updated schedule.

Week	Date	In Class	Mini-lecture Topic	Items Due	Milestone
1	1/10/2024	Discuss syllabus, class plan, and proposal assignment	Experimental Design	Finals schedule and lecture topics (end of week)	
2	1/17/2024	Peer review prototype testing proposals	Captions and Cross Referencing	Team contracts, draft prototype testing proposals (before class)	Draft proposals submitted to AgInno for feedback
3	1/24/2024	Data collection and analysis		Final testing plan (before class)	
4	1/31/2024	Data collection and analysis			
5	2/7/2024	Data collection and analysis			
6	2/14/2024	Finalize designs and parts lists			Final configuration identified, parts ordered
7	2/21/2024	Present progress reports, discuss final deployment plans with Don		Progress report (before class)	
8	2/28/2024	Discuss manual sections, prepare equipment for trip			All equipment packed for trip
9	3/6/2024	<i>Spring Break (No class - Trip to Chisec from March 3-9 to deploy dryer and monitoring systems)</i>			
10	3/13/2024	Debrief trip, check field data, work on manuals	Trip Report (Student-led)		
11	3/20/2024	Work on manuals	Faith and Engineering		
12	3/27/2024	Peer review manuals			
13	4/3/2024	Evaluate initial field data, clean up lab space/equipment	Professional Relationships	Final manual (before class)	Final manuals submitted to AgInno
14	4/10/2024	Senior survey, teamwork evaluations, work on final report	Formal Peer-review Process	Senior survey and teamwork evaluations (end of class)	
15	4/17/2024	Peer review report sections (formal)		Draft final report and comment sheets	
16	4/24/2024	Practice presentation with peer feedback		Final report and comment responses (end of week)	Final report submitted to AgInno
17	TBD	Final presentation (final exam session) - Date/time TBD		Presentation slides (end of class)	Final presentation files submitted to AgInno