



Physics and Engineering
School of STEM

EGR 1023/1023L – Introduction to Engineering II and Lab

Number of Units: 2+1

Spring 2026

Meeting days/times
(Lecture: R 1:30 pm – 3:15 pm)
(Lab: T 12:25pm – 3:15pm)

Meeting location (Rohr Science (RS) 295)

Final Exam: (Tuesday, 5/5, 1:30 – 4:00 pm)

Instructor Title and Name: Dr. Anthony Cortez

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Office Location and Office Hours: RS 282 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

PHE: The Department of Physics & Engineering provides strong programs of study that aid in ensuring our students are well prepared for both graduate studies and careers in a variety of scientific and engineering fields. We emphasize a collaborative learning environment that allows students to thrive academically, build personal confidence, and develop interpersonal skills, while providing a Christian setting for students to learn values and judgment and pursue integration of modern scientific knowledge and Christian faith.

Course Description

EGR 1023 – Introduction to Engineering II (2)

An introduction to the engineering design process building on the tools introduced in EGR 1012. In addition to designing a prototype, students learn the engineering aspects of teamwork development, ethics, professionalism, and reporting.

Prerequisite(s): EGR 1003 with a grade of C- or higher.

Corequisite(s): EGR 1023L – Introduction to Engineering II Lab (1)

EGR 1023L – Introduction to Engineering II Lab (1)

Laboratory to compliment EGR 1023. Meets three hours per week.

Prerequisite(s): EGR 1003 with a grade of C- or higher.

Corequisite(s): EGR 1023

Program and Course Learning Outcomes

Through this course students develop skills so they will be able to:

1. Understand the basics of the engineering profession, including problem solving, design, teamwork, creativity, and ethics.
2. Apply engineering design to produce solutions that meet specified needs.
3. Develop skills in solid geometry model creation in software like SOLIDWORKS.
4. Develop skills in prototyping using techniques such as the practice of basic additive manufacturing using 3D printing.
5. Develop skills in presenting work through writing.
6. Operate introductory engineering tools/equipment safely in the lab setting (for example 3D printers and laser cutters).

STUDENT OUTCOMES ADDRESSED

Students will have:

1. an ability to 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. (LO2)
2. an ability to communicate effectively with a range of audiences. (LO3)
3. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. (LO4)
4. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives. (LO5)
5. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies. (LO7)

Required Texts and Recommended Study Resources

Students are responsible for having the required course textbooks prior to the first day of class.

All supplemental materials posted on this course site (including articles, book excerpts, or other documents) are provided for your personal academic use. These materials may be protected by copyright law and should not be duplicated or distributed without permission of the copyright owner.

1. *Access to SOLIDWORKS*
2. *Access to Microsoft Word PowerPoint, and Excel*
3. *Arduino Kit*

Assessment and Grading

Grades will be based on the following:

- **Homework/Assignments:** There will be assigned Homework/Assignments to keep you on track with the Mini Projects. Some of these will be submitted as a team and some will be submitted individually.
- **Mini Projects:** You will be creating a mini project using the engineering design process for each new tool/technique we are learning in class.
- **Team Project:** The class will culminate with a Team Project where you have the freedom to choose which technique/tool you learned from lecture to complete a project. This project will then be presented.
- **Examinations and the Final Examination.** 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. 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.

Grades will be based on the following:

Sample Standard Grade Scale Based on Percentages

| Standard Grade Scale Based on Percentages | | | | | |
|---|---------|------------|-----------|-----------|------|
| | A | B | C | D | F |
| + | | 87.5- 89.5 | 77.5-79.5 | 67.5-69.5 | |
| | 91 -100 | 81-87.5 | 71-77.5 | 61 -67.5 | 0-57 |
| - | 89.5-91 | 79.5-81 | 69.5-71 | 57-61 | |

| Grading Distribution | Percent |
|----------------------|---------|
| MiniProjects | 40 |
| Homework/Assignments | 30 |
| Final Team Project | 30 |
| Total | 100 |

Final Examination Policy

Successful completion of this class requires taking the final examination on its scheduled day. The final examination schedule is posted on the [Traditional Undergraduate Records: Final Exam 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.

Incompletes and Late Assignments

All assignments are to be submitted/turned in by the beginning of the class session when they are due—including assignments posted in Canvas. Late assignments will receive a score of zero.

Artificial Intelligence (AI) Policy

You are allowed to use Artificial Intelligence (AI) tools (e.g., ChatGPT, Gemini Pro 1.5, GrammarlyGo, Perplexity, etc) 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. If you have any doubts about using AI, please gain permission from the instructor.

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 619-849-2533). 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. Professors are able to view a student's approved accommodations through Accommodate.

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 accommodations.

LomaBooks Instructions for Students

This course is part of our course material delivery program, LomaBooks. The bookstore will provide each student with a convenient package containing all required physical materials; all digitally delivered materials will be integrated into Canvas.

You should have received an email from the bookstore confirming the list of materials that will be provided for each of your courses and asking you to select how you would like to receive any printed components (in-store pick up or home delivery). If you have not done so already, please confirm your fulfillment preference so the bookstore can prepare your materials.

For more information about LomaBooks, please go: [HERE](#)

Tentative Schedule (Subject to Updates)

| Date | In Class | Items Due | Project |
|-------------|-------------------------|------------------------------|----------------|
| Week 01 | What is Design Process? | Initial Ideas on Engineering | |
| Week 02 | Intro SolidWorks | Basic SolidWorks Design | SOLIDWORKS |

| | | | |
|-------------|---|---|---------------|
| Week 03 | SolidWorks Features | SolidWorks Features Design | SOLIDWORKS |
| Week 04 | Research and Plan/Create | Approved Plan | SOLIDWORKS |
| Week 05 | Create and Test | Final Design | SOLIDWORKS |
| Week 06 | Intro 3D Printer | SOLIDWORKS Report | 3D Printer |
| Week 07 | Research and Plan/Create | Approved Plan | 3D Printer |
| Week 08 | Create and Test | Printed Object | 3D Printer |
| Week 09 | Intro Laser Cutter | 3D Printer Report | Laser Cutter |
| Week 10 | Research and Plan | Approved Plan | Laser Cutter |
| Week 11 | Create and Test | Printed Cut | Laser Cutter |
| Week 12 | Intro CNC/Soldering Team Project Initial Ideas | Laser Cutter Report Team Project Plan Approved | CNC/Soldering |
| Week 13 | Work on Project | CNC/Soldering | Team Project |
| Week 14 | Work on Project | | Team Project |
| Week 15 | Work on Project | | Team Project |
| Finals Week | Final Presentations | Final Report | |

Additional Course Information

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

<https://docs.google.com/document/d/11BgAANLOJ9jt837d24EZ181ukM2qzHF/edit>