Point Loma Nazarene University
EGR 1012 INTRODUCTION TO ENGINEERING I (2 units)
FALL 2019

CREDIT AND CONTACT HOURS: 2 credit hours.
Class: Thursday 1:30-2:25 pm RS 265
Lab: Tuesday 12:30-2:15 am RS 265

INSTRUCTOR: Christopher T. Gabler
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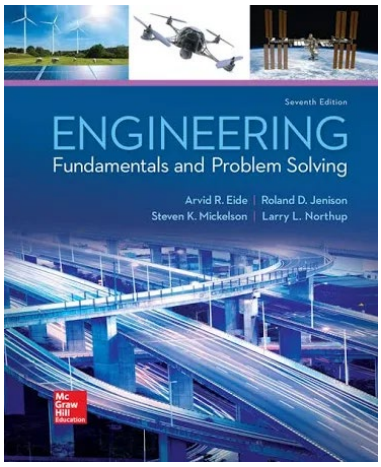
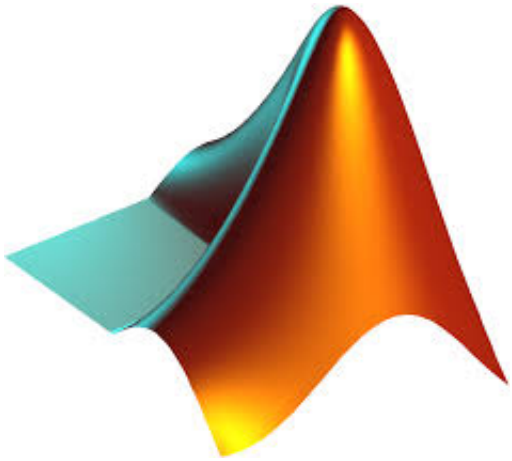
Office hours: WR 11:00 – 1:00 pm, and by appointment
Phone: Cell: 858-354-8762

TEXTBOOKS: None: handouts each class

REFERENCES/SUPPLEMENTS: *Engineering Fundamentals and Problem Solving* 7th Edition by Arvid R. Eide, Roland Jenison, Larry L. Northup, Steven Mickelson;
Matlab software student license (good for 4 years)





CATALOG:
EGR1012 Introduction to Engineering I (1)
An introduction to engineering as a career, including problem solving, engineering disciplines, design, teamwork, and communication. Introduction to multiple tools/techniques used by engineers, including data analysis, numerical methods, error analysis, and the use of computers for solving problems in physics and engineering.
Co-requisite: MTH 133 (or equivalent) and EGR1012L.

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EGR1012 Introduction to Engineering I Lab (1)
Laboratory to compliment EGR1012. Meets two hours per week.
Co-requisite: EGR1012

COURSE LEARNING OUTCOMES/EXPECTED PERFORMANCE CRITERIA:
Students will:

1. understand the basics of the engineering profession, including problem solving, design, teamwork, creativity, and ethics.
2. demonstrate the ability to communicate graphical information concerning three-dimensional objects.
3. produce, on the sketch pad and on the computer, assigned drawings of various objects.

PROGRAM OUTCOMES: This course contributes to meeting the program outcomes by developing student skills in the following areas. Students will have

a) an ability to apply knowledge of mathematics, science, and engineering;
b) an ability to design a system, component, or process to meet desired needs within realistic; constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
c) an understanding of professional and ethical responsibility;
d) an ability to communicate effectively;
e) a recognition of the need for, and an ability to engage in life-long learning;
f) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

GRADING

Class Activities	10%	Quizzes	20%
Homework	25%	Final	20%
Labs	25%		

Final grades will be determined as follows:

100-93%	A
90-92.9%	A-
87-89.9%	B+
83-86.9%	B
80-82.9%	B-
77-79.9%	C+
73-76.9%	C
70-72.9%	C-
67-69.9%	D+
63-66.9%	D
60-62.9%	D-
0-59.9%	F

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COURSE ORGANIZATION

Lectures: PowerPoint and interactive discussion will cover the topics below. In class assignments on the topics will be performed within designated groups and handed in before the end of class. All members present for the assignment will receive the same grade on that assignment. Those not present will receive no credit for that assignment.

Homework: will be assigned weekly at the end of the lecture period (Tuesdays) and due before the start of the next lecture. Many of the homework assignments will have questions and problems with no single "right" answer. Those will be graded based on your originality, creativity and ability to independently research. Copied answers will be given zero credit.

Quizzes: Regular quizzes will be given during the class period to test your understanding and retention of the material covered since the last quiz. These tests may not be announced ahead of time and absence or late arrival to a class will not be accommodated except as discussed below. Your own personal handwritten notes may be used.

Labs: Hands-on lab assignments will be made weekly, culminating in an independent group project. Lab sessions are mandatory and will include weekly documentation. All hands-on work must be done in the lab room and during lab period or other times when the room is specifically made available. Unless otherwise stated the lab assignments are due no later than the beginning of the next lab session. If the lab requires a demonstration, you will be given one opportunity to do so. It will be signed off at this time and results marked. Labs will be graded primarily on creativity, teamwork and adherence to the engineering process/project goals and constraints, including schedules and requirements. Each lab group will receive the same base grade for each assignment but this base grade may be adjusted up or down based on an individual's observed level of contribution.

Late Work:

No late assignments will be accepted but the lowest grade for each type of assignment (homework, in-class assignments, quizzes) will be dropped. Independent thinking and communication skills are a big part of the class objectives so **answers should be original and in your own words** and will be graded accordingly.

Missed Exams:

If you will miss a class, lab or exam for a school function, you must arrange to make it up **ahead of time**. This includes accommodations for missing real-time group assignments due to your requirement at a school function. These will be addressed on a case by case basis and depending on the assignment may require you to do it on your own ahead of time as feasible. It is your responsibility to let the professor know of such an absence enough ahead of time to accommodate. Absences due to unexpected emergencies will require documentation from a reliable and verifiable source of the time and reason for such absence.

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UNIVERSITY MISSION:
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 becomes 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.

ATTENDANCE:
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 Attendance Policy in the in the Undergraduate Academic Catalog.

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.

ACADEMIC ACCOMMODATIONS:
While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center. (DRC@pointloma.edu or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 (a) prohibits discrimination against students with special needs and

guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.

If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

ACADEMIC HONESTY
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 the catalog for definitions of kinds of academic dishonesty and for further policy information.

FINAL EXAM:
The final exam will be comprehensive over all the material covered in the class. 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.
The Final Exam will be Tuesday, December 17 from 1:30 – 4:00 pm.

COPYRIGHT PROTECTED MATERIALS:
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.

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CREDIT HOURS:
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.

EXPECTED SCHEDULE BY WEEK:

1. Intro, Class format & grading, What is Engineering
2. Engineering Design, Lab: Mindstorms Intro, Tool: Excel
3. Teamwork, Lab: Mindstorms Robotics, Tool: Excel
4. Communication, Lab: Mindstorms Robotics, Tool: Inventor 3D modeling
5. Estimation, Lab: Arduino Intro, Tool: Inventor 3D modeling
6. Problem solving, Lab: Arduino, Tool: Inventor 3D modeling
7. Prototyping and Testing, Lab: Arduino, Tool: Inventor 3D modeling
8. Units and Measurements, Lab: Final Project, Tool: Inventor 3D modeling
9. Graphing and Visual Tools, Lab: Final Project, Tool: Matlab
10. Systems Thinking, Lab: Final Project, Tool: Matlab
11. Leadership, Lab: Final Project, Tool: Matlab
12. Engineering as a Mission, Lab: Final Project, Tool: Matlab
13. Engineering Ethics, Lab: Final Project, Tool: Matlab
14. Engineering in Business, Lab: Final Project
15. Review, Lab: Final Demo

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