

Course Outline for ENGR 1
INTRODUCTION TO ENGINEERING
Effective: Fall 2020

I. CATALOG DESCRIPTION:

ENGR 1 — INTRODUCTION TO ENGINEERING — 2.00 units

Introduction to careers, activities, and topics related to the field of engineering, including computer applications to design and problem solving.

2.00 Units Lecture

Strongly Recommended

- Eligibility for ENG 1A/1AEX -
 with a minimum grade of C

Grading Methods:

Letter or P/NP

Discipline:

- Engineering

	MIN
Lecture Hours:	36.00
Expected Outside of Class Hours:	72.00
Total Hours:	108.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering this course, it is strongly recommended that the student should be able to:

- A. -Eligibility for ENG 1A/1AEX
 1. Produce written work that reflects academic integrity and responsibility, particularly when integrating the exact language and ideas of an outside text into one's own writing
 2. Utilize effective grammar recall to check sentences for correct grammar and mechanics
 3. Proofread his/her own and others' prose

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

- A. Demonstrate a basic knowledge of the different engineering branches;
- B. Understand how engineering branches and engineering functions differ;
- C. Demonstrate by discussing and writing what is expected of engineers;
- D. Identify the 5 basic steps in engineering design, and apply them in developing a solution to a design project assignment;
- E. Explain the procedural steps, and benefits, involved in obtaining a professional engineering license;
- F. Develop, edit and proofread a professional resume;
- G. Investigate internet-based content related to the engineering major and the engineering profession;
- H. Define and discuss ethics in engineering;
 - I. Develop software spreadsheet skills, using Microsoft Excel, used in computer programming type applications.

V. CONTENT:

- A. Engineering and engineers in society
- B. Engineering Discipline Review
 1. What school is best for you and why
 2. History of Las Positas College engineering transfer students
 3. Identify resources and support services to assist in transfer
- C. Engineering Branches
 1. Mechanical engineering
 2. Civil and Environmental engineering
 3. Electrical and Electronic engineering
 4. Computer science

- 5. Materials engineering
- 6. Chemical engineering
- 7. Industrial engineering
- 8. Aeronautical engineering
- D. Interviewing a working engineer
- E. Writing a professional resume
 - 1. Resume writing techniques
 - 2. Interviewing issues
- F. Engineering functions
- G. Engineering design / design project
 - 1. The 5 steps involved in engineering design
- H. Professional Engineer licensing requirements
 - 1. Education and work experience requirements
 - 2. The two main types of licensing examinations
 - 3. What a license allows an engineer to do
- I. Ethics in engineering
 - 1. Why necessary
 - 2. Respect and credibility
- J. Intellectual Property
- K. Use of Microsoft Excel software in solving engineering-related problems

VI. METHODS OF INSTRUCTION:

- A. **Projects** - Hands-on engineering design projects
- B. **Written Exercises** - Writing an interview summary
- C. **Written Exercises** - Writing and editing a professional resume
- D. **Lecture** - Powerpoint lectures on a variety of subjects
- E. **Demonstration** - Build an audio speaker project
- F. **Written Exercises** - Written textbook reading assignments
- G. **Discussion** - Small Group Discussion
- H. **Guest Lecturers** - Local professional engineers
 - I. **Lab** - Computer-based MS Excel assignments
 - J. **Lab** - Introduction to Solidworks CAD software

VII. TYPICAL ASSIGNMENTS:

- A. Homework
 - 1. Reading assignments from textbooks
 - 2. Interview a working engineer
 - 3. Develop a professional resume, and investigate engineering job openings
 - 4. Researching engineering statistics online
 - 5. Interview a working engineer, and write a summary of the interview.
- B. Laboratory assignments
 - 1. Creating a working transcript using MS Excel software
 - 2. Creating a parabola graphing program using MS Excel software
- C. Hands-on Design and Building Projects
 - 1. Review steps involved in the Engineering design process
 - 2. Table Jumper Design Project
 - 3. Build an audio speaker project
 - 4. Build a truss structure project
 - 5. Construct and troubleshoot an electronics problem involving Arduino technology

VIII. EVALUATION:

Methods/Frequency

- A. Exams/Tests
 - Final Examination
- B. Quizzes
 - 1-2 quizzes
- C. Papers
 - Interview an Engineer
- D. Oral Presentation
 - Oral Reports on design project
- E. Projects
 - Build a truss / Build an Arduino project
- F. Group Projects
 - Table Jumper Design Project
- G. Class Participation
 - In class discussion Participation in group projects
- H. Home Work
 - Reading Assignments Write a Resume Transfer Plan
- I. Lab Activities
 - MS Excel assignments Solidworks assignments

IX. TYPICAL TEXTS:

1. Landis, Ray. *Studying Engineering: A Road Map to a Rewarding Career*. 5th ed., Discovery Press, 2018.
2. Oakes, William, and Les Leone. *Engineering Your Future: A Comprehensive Introduction to Engineering*. 9th ed., Oxford University Press, 2016.
3. Stephan, Elizabeth, and David Bowman. *Thinking Like An Engineer: An Active Learning Approach*. 4th ed., Pearson, 2017.
4. Moaveni, Saeed. *Engineering Fundamentals: An Introduction to Engineering*. 6th ed., Cengage Learning, 2019.
5. Brockman, Jay. *Introduction to Engineering: Modeling and Problem Solving*. 1st ed., John Wiley and Sons, 2009.
6. Martin, Gary. *Welcome to the Professional World*. 4th ed., Cognella Academic Publishing, 2015.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

- A. Computer file storage (e.g., USB drive)