ENGR G101: INTRODUCTION TO ENGINEERING AND TECHNOLOGY

Item	Value
Curriculum Committee Approval Date	09/03/2019
Top Code	092400 - Engineering Technology, General (requires Trigonometry)
Units	2 Total Units
Hours	36 Total Hours (Lecture Hours 36)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)

Course Description

This course explores the branches of engineering, the functions of an engineer, and the industries in which engineers work. It explains the engineering education pathways and explores effective strategies for students to reach their full academic potential. It presents an introduction to the methods and tools of engineering problem solving and design including the interface of the engineer with society and engineering ethics. It develops communication skills pertinent to the engineering profession. Transfer Credit: CSU; UC. C-ID: ENGR 110. **C-ID:** ENGR 110.

Course Level Student Learning Outcome(s)

1. Course Outcomes
2. Analyze the steps, which enable the quantifying of laboratory data into a curve presentation.
3. Demonstrate calculator skills in the determination of measurement limitations, errors, and dimensional analysis.
4. Present a working knowledge of the engineering and the technology professions and their associated career responsibilities and opportunities.

Course Objectives

- 1. Describe the role of engineers in society and classify the different engineering branches, the functions of an engineer, and industries in which they work.
- 2. Identify and describe academic pathways to bachelors degrees in engineering.
- 3. Identify, modify, and present a typical engineering drawing using basic tools.
- 4. Create a simple engineering project with graphics and computations that are based on a given data set.
- 5. Analyze engineering problems using the engineering design process.
- 6. Develop and apply effective strategies to succeed academically.
- 7. Explain engineering ethical principles and standards.
- 8. Demonstrate knowledge of effective practices for writing technical engineering documents and making oral presentations.
- 9. Demonstrate teamwork skills in working on an engineering design team.

Lecture Content

History of Engineering and Technology Engineering developments by field Global developments in structure and mechanism design in relation to historical movements and economic conditions Scope of Engineering Functions of engineering in society Major engineering fields Computer Engineering Mechanical engineering Electrical and computer science engineering Civil and architectural engineering Chemical and material science engineering Environmental Engineering Biomedical Engineering Industrial Engineering Systems Engineering High growth potential engineering markets Engineering and technical organizations Engineering Problem Solving and Computer Tools Analytic and creative problem solving Word Processing and spreadsheet techniques used in design with graphic presentation Communication of Technical Concepts to Engineering Professionals and the General Public Teamwork Skills, Problem Solving, and Professional Development Individual and/or group project completion with focus on one or more engineering fields Analyzing a real world engineering problem and presenting conclusions in a professional report. Role of engineers in society and comparison of engineering, science, and technology. Engineering profession – branches, functions, industries, careers, job outlook. Professionalism and ethics Engineering education: academic success, curriculum, pathways, preparation for upper division coursework Engineering design, creativity, and problem-solving processes (includes working as a team member on an engineering design project) Recycling and energy reduction s tudies Written and oral communication skills related to engineering Exposure to modern engineering tools and practices Engineering design projects Tours of engineering facilities Industry speakers Statistical Profiles of Majors, Degrees and Employment in Engineering (optional) University engineering programs Engineering work experience and internships

Method(s) of Instruction

- Lecture (02)

Instructional Techniques

Lecture/Discussion Collaborative Group Learning Article Handouts Multimedia Presentations Web Enhanced Homework Assignments Group or Individual Projects Problem Solving and Technology Sessions Hands on experiments involving various teaching equipment for engineering. Guest speakers

Reading Assignments

Textbook Published Articles Case Studies

Writing Assignments

Projects Reports Exam questions that require written explanation of a topic or a concept

Out-of-class Assignments

Textbook or Online Homework Assignments Projects Problem solving applications requiring critical thinking

Demonstration of Critical Thinking

Students will demonstrate critical thinking and problem solving skills by using logic to solve and interpret a variety of engineering applications.

Demonstrations will be shown by completing assignments, participating in discussions, and completing required exams and projects.

Required Writing, Problem Solving, Skills Demonstration

Students will demonstrate problem solving skills when they write their own solutions to regular homework problems, quiz problems, individual and group projects, and exam problems.

Eligible Disciplines

Engineering: Masters degree in any field of engineering OR bachelors degree in any of the above AND masters degree in mathematics, physics, computer science, chemistry, or geology OR the equivalent. (NOTE: A bachelors degree in any field of engineering with a professional engineers license is an alternative qualification for this discipline.) Masters degree required. Title 5, section 53410.1 Engineering technology: Masters degree in any field of engineering technology or engineering OR bachelors degree in either of the above AND masters degree in physics, mathematics, computer science, biological science, or chemistry, OR bachelors degree in industrial technology, engineering technology or engineering AND a professional engineers license OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Moaveni. Engineering Fundamentals; An Introduction to Engineering, 1st edition ed. Cengage, 2020

Other Resources

1. Hands-on Engineering Modules Apparatus such as kits to explore a variety of engineering concepts.