

**Course Outline**

**COURSE:** ENGR 10A      **DIVISION:** 10      **ALSO LISTED AS:**

**TERM EFFECTIVE:** Fall 2019      **CURRICULUM APPROVAL DATE:** 04/09/2019

**SHORT TITLE:** INTRO TO ENGR I

**LONG TITLE:** Introduction to Engineering I

Units	Number of Weeks		Contact Hours/Week		Total Contact Hours
2	18	Lecture:	2	Lecture:	36
		Lab:	0	Lab:	0
		Other:	0	Other:	0
		Total:	2	Total:	36

**COURSE DESCRIPTION:**

Engineering 10A introduces students to the engineering profession. The course explains the engineering education pathways and explores effective strategies for students to reach their full academic potential. Topics will include an introduction to the various engineering disciplines; the role of engineers and engineering in society; the curriculum requirements for the various engineering disciplines at different four-year institutions; academic success strategies; personal and professional development techniques; an introduction to the engineering design process; an introduction to engineering problem-solving methodologies; engineering ethics; communication skills; and working as a member of a team. .  
**ADVISORY:** English 250.

**PREREQUISITES:**

**COREQUISITES:**

**CREDIT STATUS:** C - Credit - Degree Non Applicable

**GRADING MODES**

L - Standard Letter Grade

**REPEATABILITY:** N - Course may not be repeated

**SCHEDULE TYPES:**

02 - Lecture and/or discussion

### **STUDENT LEARNING OUTCOMES:**

1. Explore the engineering profession and compare and contrast the various disciplines.

Measure of assessment: Exam and homework.

Year assessed, or planned year of assessment: 2019

Semester: Fall

2. Identify and describe academic pathways to bachelor's degrees.

Measure of assessment: Exam and homework.

3. Develop and apply effective strategies to succeed academically.

Measure of assessment: Exam and homework.

4. Explain engineering ethical principles and standards.

Measure of assessment: Exam, homework, lab.

Year assessed, or planned year of assessment: 2020

Semester: Fall

5. Demonstrate knowledge of effective practices for writing technical engineering documents and making oral presentations.

Measure of assessment: Exam, homework, lab.

6. Analyze engineering problems using the engineering design process.

Measure of assessment: Exam, lab.

7. Demonstrate teamwork skills in working on an engineering design team

### **CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS**

Curriculum Approval Date: 04/09/2019

Overview of the Course:

1. Role of engineers in society and comparison of engineering, science, and technology

2. Engineering profession – branches, functions, industries, careers, job outlook

3. Professionalism and ethics

4. Engineering education: academic success, curriculum, pathways, preparation for upper division coursework

5. Engineering design, creativity, and problem-solving processes (includes working as a team member on an engineering design project)

6. Written and oral communication skills related to engineering

7. Exposure to modern engineering tools and practices

Activities may include: engineering design projects, tours of engineering facilities, industry speakers

Total 36 Lec Hours.

HOURS: 2 Lec

TOPIC: Definition and history of engineering. Introduction to various engineering disciplines. Role of engineers and engineering in society.

STUDENT PERFORMANCE OBJECTIVE: Students will identify the role of an engineer in society and the various fields of engineering.

**OUT OF CLASS ASSIGNMENTS:** Read chapter 1 from book.

HOURS: 2 Lec

TOPIC: Keys to success in engineering study, Mindsets, Attitudes, ABET, Education models.

STUDENT PERFORMANCE OBJECTIVE: Students will develop strategies to succeed academically.

OUT OF CLASS ASSIGNMENTS: Written assignment HW 1.

HOURS: 2 Lec

TOPIC: Rewards and opportunities of an engineering career, greatest engineering achievements.

STUDENT PERFORMANCE OBJECTIVE: Students will develop personal goals for their careers.

OUT OF CLASS ASSIGNMENTS: Read chapter 2.1-2.6 from book and written assignment HW 2.

HOURS: 2 Lec

TOPIC: Engineering Disciplines, Job Functions, Job Outlook, Professional Societies, Professional Registration.

STUDENT PERFORMANCE OBJECTIVE: Students will compare and contrast the various engineering disciplines.

OUT OF CLASS ASSIGNMENTS: Read chapter 2.7-2.10 from book and Written assignment HW 3.

HOURS: 2 Lec

TOPIC: Learning and learning styles, become an expert learner, learning as a reinforcement process, seeking help

STUDENT PERFORMANCE OBJECTIVE: Students will identify their learning style and adopt new learning methodologies.

OUT OF CLASS ASSIGNMENTS: Read chapter 3 from book and Written assignment HW 3.

HOURS: 2 Lec

TOPIC: Making the most of how you are taught.

STUDENT PERFORMANCE OBJECTIVE: Students will identify strategies for early course preparation and effective communication with peers and instructors.

OUT OF CLASS ASSIGNMENTS: Read chapter 4 from book and written assignment HW 4.

HOURS: 2 Lec

TOPIC: Making the learning process work for you.

STUDENT PERFORMANCE OBJECTIVE: Students will identify how to better organize and prioritize their tasks.

OUT OF CLASS ASSIGNMENTS: Read Chapter 5 and written assignment HW 5.

HOURS: 2 Lec

TOPIC: Orientation to the Engineering Education System.

STUDENT PERFORMANCE OBJECTIVE: Students will explore how an engineer degree can be used in the workforce.

OUT OF CLASS ASSIGNMENTS: Read Chapter 8 and take home project (Interview your Professor).

HOURS: 2 Lec

TOPIC: Personal Growth and Development.

STUDENT PERFORMANCE OBJECTIVE: Students will identify their strengths, weakness and areas of improvement.

OUT OF CLASS ASSIGNMENTS: Read Chapter 6.0-6.4 and written assignment HW 6.

HOURS: 2 Lec

TOPIC: Oral and written communication, Mental and Physical Wellness.

STUDENT PERFORMANCE OBJECTIVE: Students will work in teams and practice their written and communication skills.

In class activity: Making a professional presentation using PowerPoint.

OUT OF CLASS ASSIGNMENTS: Read Chapter 6.5-6.8 and written assignment HW 7.

HOURS: 2 Lec

TOPIC: Student Organizations, Internships, Co-curricular activities.

STUDENT PERFORMANCE OBJECTIVE: Students will identify the educational value of co-curricular and extra-curricular activities.

OUT OF CLASS ASSIGNMENTS: Read Chapter 7 and written assignment HW 8.

HOURS: 2 Lec

TOPIC: Engineering Ethics.

STUDENT PERFORMANCE OBJECTIVE: Students will identify the ethical principles of the engineering profession.

OUT OF CLASS ASSIGNMENTS: CASE STUDY - Challenger explosion and the O-Ring.

HOURS: 2 Lec

TOPIC: Final Research Project Guidelines

STUDENT PERFORMANCE OBJECTIVE: Students will design an engineering based process for becoming a "World-Class" Engineering Student.

OUT OF CLASS ASSIGNMENTS: Work on Final Project

HOURS: 2 Lec

TOPIC: Problem Solving Strategies: Thinking like an Engineer.

STUDENT PERFORMANCE OBJECTIVE: Students will be presented with a modelling problem based on a cable car. Student will then

implement a solution using Microsoft Excel.

OUT OF CLASS ASSIGNMENTS: Work on Final Project and Practice Plotting tools on Microsoft Excel.

HOURS: 2 Lec

TOPIC: Engineering Computational Tools (Introduction to an engineering programming language (FREEMAT/MATLAB).)

STUDENT PERFORMANCE OBJECTIVE: Students will learn some basic programming skills.

OUT OF CLASS ASSIGNMENTS: Work on Final Project and Practice Programming problem Set.

HOURS: 2 Lec

TOPIC: Professional Engineering Organizations

STUDENT PERFORMANCE OBJECTIVE: Students will identify the different types of Engineering Societies and their value.

OUT OF CLASS ASSIGNMENTS: Work on Final Project.

HOURS: 2 Lec

TOPIC: Beyond the traditional roles of engineers. Engineers of the future.

STUDENT PERFORMANCE OBJECTIVE: Students will identify how modern technology has shaped the traditional roles of engineers.

HOURS: 2

### **METHODS OF INSTRUCTION:**

Instruction will follow a standard lecture/discussion format with an additional laboratory period. Homework will be assigned in order to assure mastery of the concepts covered in class. During class discussion students will also be required to utilize engineering programs such as: Microsoft Excel, PowerPoint, MATLAB or FREEMAT (programming language). Throughout the course, students will be given opportunities to work together on problems given in class and group projects.

### **OUT OF CLASS ASSIGNMENTS:**

Required Outside Hours: 72

Assignment Description: Analyze and study pertinent text material, solved examples and lecture notes. Apply principles and skills covered in class by solving regularly-assigned homework problems. Regularly synthesize course materials in preparation for exams. Some of the assignments will be in the form of take home projects where students will work in groups.

**METHODS OF EVALUATION:**

Writing assignments

Percent of total grade: 40.00 %

A combination of written homework assignments and projects.

Problem-solving assignments

Percent of total grade: 15.00 %

Homework assignments

Objective examinations

Percent of total grade: 30.00 %

There will be 3 equally weighted exams.

Skill demonstrations

Percent of total grade: 15.00 %

**REPRESENTATIVE TEXTBOOKS:**

Required:

Raymond B. Landis. Studying Engineering, A Road Map to a Rewarding Career 4th Edition. Discovery Press,2013.

ISBN: 978-0-9793487-4-7

Reading Level of Text, Grade: 12 Verified by: Verified using MS Word

## **ARTICULATION and CERTIFICATE INFORMATION**

Associate Degree:

CSU GE:

CSU B1, effective 201970

CSU B5, effective 201970

CSU B6, effective 201970

CSU B9, effective 201970

IGETC:

CSU TRANSFER:

Transferable CSU, effective 200230

UC TRANSFER:

Transferable UC, effective 201970

## **SUPPLEMENTAL DATA:**

Basic Skills: N

Classification: Y

Noncredit Category: Y

Cooperative Education:

Program Status: 2 Stand-alone

Special Class Status: N

CAN:

CAN Sequence:

CSU Crosswalk Course Department: ENGR

CSU Crosswalk Course Number: 110

Prior to College Level: Y

Non Credit Enhanced Funding: N

Funding Agency Code: Y

In-Service: N

Occupational Course: E

Maximum Hours:

Minimum Hours:

Course Control Number: CCC000188483

Sports/Physical Education Course: N

Taxonomy of Program: 090100