

EASTERN ARIZONA COLLEGE

Introduction To Engineering

Course Design
2019-2020

Course Information

Division Mathematics
Course Number EGR 102 (SUN# EGR 1102)
Title Introduction to Engineering
Credits 4
Developed by Tom Palmer/Revised by Cliff Thompson
Lecture/Lab Ratio 4 Lecture/0 Lab

Transfer Status

ASU	NAU	UA
FSE 100 (2) & FSE 101 (1) & Elective Credit	EGR 186	ENGR 102

Activity Course No
CIP Code 14.0101
Assessment Mode Pre/Post Test (20 Questions/100 Points)
Semester Taught Fall and Spring
GE Category None
Separate Lab No
Awareness Course No
Intensive Writing Course No
Diversity and Inclusion Course No

Prerequisites

MAT 120 or higher with a grade of "C" or higher or placement test score as established by District policy

Educational Value

This course is intended not only for engineering students, but also for those who wish to explore and discover a career in engineering. Lectures are specially designed to simulate the tasks that engineers perform. Students design and build several hands-on projects resulting in artifacts or prototypes. Students acquire a general overview of various engineering disciplines, develop their teamwork and organizational skills, use electronic spreadsheets and other engineering software, plan a possible future career in engineering, and participate in fun-filled contests involving friends and peers.

Description

Engineering design, effective team participation and career preparation. Students are expected to participate in hands-on design projects, develop education/career plans and initiate development of the personal and management skills necessary for lifelong learning.

Supplies

None

Competencies and Performance Standards

1. Apply the engineering design process.

Learning objectives

What you will learn as you master the competency:

- a. Formulate a problem.
- b. Solve a problem.
- c. Implement a solution.
- d. Document the process.
- e. Use engineering/physical principles.
- f. Use quality principles.

Performance Standards

You will demonstrate your competence:

- o in team design projects
- o on assignments
- o on midterm and final exams

Your performance will be successful when:

- o learner can formulate an engineering design problem
- o learner can solve an engineering design problem
- o learner can implement a solution to a design problem
- o learner can document the process in an organized fashion
- o learner can correctly apply engineering/physical principles in the design process
- o learner can correctly apply quality principles in the design process

2. Employ team-building techniques.

Learning objectives

What you will learn as you master the competency:

- a. Recognize team dynamics.
- b. Foster team communication.
- c. Establish social norms.
- d. Understand and implement techniques for conflict resolution.

Performance Standards

You will demonstrate your competence:

- o in team design projects
- o on assignments
- o on midterm and final exams

Your performance will be successful when:

- o learner recognizes team dynamics
- o learner fosters team communication

- o learner establishes social norms for the team
- o learner understands and implements techniques for conflict resolution

3. Describe the engineering profession.

Learning objectives

What you will learn as you master the competency:

- a. Identify the attributes of an engineer.
- b. Describe the various types of engineering disciplines.
- c. Discuss topics related to professional ethics.

Performance Standards

You will demonstrate your competence:

- o on assignments
- o on midterm and final exams

Your performance will be successful when:

- o learner identifies the attributes of an engineer
- o learner recognizes the various types of engineering work and the various engineering disciplines
- o learner discusses topics related to professional ethics

4. Acquire personal learning and management skills.

Learning objectives

What you will learn as you master the competency:

- a. Design an educational and career plan.
- b. Implement strategies to facilitate learning in various environments.
- c. Implement strategies for assessing progress in the career plan.
- d. Identify the principles of time management.

Performance Standards

You will demonstrate your competence:

- o on the team design projects
- o on assignments
- o on midterm and final exams

Your performance will be successful when:

- o learner designs an educational and career plan
- o learner implements strategies to facilitate learning in various environments
- o learner implements strategies for assessing progress in the career plan
- o learner identifies the principles of time management

5. Present oral and written reports of technical work.

Learning objectives

What you will learn as you master the competency:

- a. Explain the basic structure for the presentation of technical work.
- b. Explain the basic requirements for presenting work in graphical form.

- c. Organize and present oral and written reports of technical work.
- d. Access information through a variety of sources including electronic forums.

Performance Standards

You will demonstrate your competence:

- o on the team design projects
- o on assignments
- o on midterm and final exams

Your performance will be successful when:

- o learner explains the basic structure for the presentation of technical work
- o learner explains the basic requirements for presenting work in graphical form
- o learner organizes and presents oral and written reports of technical work
- o learner accesses information through a variety of sources including electronic forums

6. Create mathematical models.

Learning objectives

What you will learn as you master the competency:

- a. Construct mathematical models to solve technical problems.
- b. Implement mathematical models using mathematical software.

Performance Standards

You will demonstrate your competence:

- o in the team design projects
- o in assignments using electronic spreadsheets
- o on midterm and final exams

Your performance will be successful when:

- o learner constructs mathematical models to solve technical problems
- o learner implements mathematical models using spreadsheet software and/or other mathematical software

Types of Instruction

Lecture/Discussion

Team Design

Grading Information

Grading Rationale

Instructors may develop evaluative procedures subject to the following parameters:

1. Design projects must represent at least 40% of the total course grade.
2. Partial-term exam(s) and/or quizzes must represent at least 10% of the total course grade. This does not include the final exam.
3. The final exam must include the pre/post test and must represent at least 15% of the total course grade. The pre/post test portion of the final exam must represent a minimum of 10% points of the total course grade.
4. Attendance must represent at least 5% of the total course grade.

5. Other activities may represent at most 30% of the total course grade. These activities may included the development of a personal Resume, in-class solutions of typical engineering problems using electronic spreadsheets and its graphical capabilities, solutions of typical engineering problems using other Engineering software packages, the participation in cooperative learning, etc. This list is not comprehensive and is provided here as a sample of the type of activities that may be included in this item. Specific activities will be contained in the syllabus or opportune presented to the students during the semester.

Grading Scale

A	90%-100%
B	80%-89%
C	70%-79%
D	60%-69%
F	Below 60%