

SOUTHEAST COMMUNITY COLLEGE
DIVISION OF ARTS AND SCIENCES
Mathematics
Revision Date: 7-01-19

I. CATALOG DESCRIPTION

Course Number: ENGR1010
Course Title: Engineering Design
Prerequisite(s): A grade of 'C' or higher in MATH1150, appropriate score on the math placement test, or permission.
Co-requisite: None
Catalog Description: Introduction to the engineering profession, engineering problem solving and engineering design with an emphasis on current topics. Course material will be presented using projects and group learning activities.
Credit Hours: 3.0
Class Hours: 45
Lab Hours: 0
Total Contact Hours: 45

II. COURSE OBJECTIVES: *Course will:*

- A. Introduce the engineering design process.
- B. Provide opportunities to apply the design process in the context of hands-on projects.
- C. Provide opportunities to practice presenting technical material to a general audience.
- D. Introduce students to current economic and technological issues relevant to modern energy systems.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. Identify and apply basic engineering design principles.
 - 2. Successfully solve basic open ended design problems in a team environment.
 - 3. Communicate technical material to a general audience.
- B. General Education Learning Outcomes
 - 1. GELO #3: Critical Thinking & Problem Solving
 - Outcome: Collect, identify, interpret and analyze data.
 - Outcome: Synthesize information to arrive at reasoned solutions to problems.
 - Outcome: Evaluate the validity of arguments, alternatives, data, outcomes, and/or impacts of actions.
 - 2. GELO #5: Analytical, Quantitative, and Scientific Reasoning
 - Outcome: Apply mathematical and scientific methods to solve problems from an array of contexts and everyday situations.
 - Outcome: Understand and create logical arguments supported by quantitative and scientific evidence and communicate those arguments in a variety of formats.
 - Outcome: Effectively develop strategies, algorithms, or experiments (or performing experiments) to better describe the systems or to solve the problems.
 - Outcome: Manipulate formulas, data sets, graphs, tables, etc. in a way to produce a meaningful outcome.

IV. CONTENT/TOPICAL OUTLINE (*course outline may provide more detailed information*)

- A. Basic Digital Circuits
- B. Elementary programming in python
- C. Engineering economics

- D. Work and energy
- E. Data gathering, fitting, and regression
- F. Heat transfer and ideal gas thermodynamics
- G. Renewable and alternative energy

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s):
 - 1. Eide, Jenison, Northup, and Mickelson, *Engineering: Fundamentals and Problem Solving* 5th Edition, McGraw Hill, 2008. ISBN: 978-0-07-319158-4.

VI. METHODS OF PRESENTATION/INSTRUCTION

- A. Methods of presentation typically include a combination of the following:
 - 1. Lectures
 - 2. Small group discussions
 - 3. Demonstrations
 - 4. Design projects
 - 5. Collaborative team problem solving

VII. METHODS OF EVALUATION

- A. Methods of evaluation typically include a combination of the following:
 - 1. Quizzes
 - 2. Class participation
 - 3. Homework
 - 4. Presentations
 - 5. Projects
 - 6. Final exam
- B. SCC GRADING SCALE

A+	95-100	C+	75-79	F	59 or less
A	90-94	C	70-74		
B+	85-89	D+	65-69		
B	80-84	D	60-64		

VIII. SPECIFIC COURSE REQUIREMENTS

- A. NONE