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

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