

**SOUTHEAST COMMUNITY COLLEGE
DIVISION OF ARTS AND SCIENCES**

Mathematics

Revision Date: 07-01-19

[Syllabus Statements](#)

I. CATALOG DESCRIPTION

Course Number: ENGR2010
Course Title: Introduction to Circuits and Electronics
Prerequisites: MATH1700 or higher (required), PHYS2120 (recommended but not required), or instructor permission.
Course Description: This course covers basic circuit analysis, including direct currents, alternating currents, and operational amplifiers. The course also includes basic digital signals and circuits. The course is taught in an interactive style that integrates lecture, laboratory, and small group activities into one combined session.
Credit Hours: 4.0
Class Hours: 45
Lab Hours: 30
Total Contact Hours: 75

II. COURSE OBJECTIVES: *Course will:*

- A. Teach fundamental concepts of DC and AC circuit analysis.
- B. Teach basic methods and circuits for amplifying and filtering signals.
- C. Teach basic methods of digital signals.
- D. Teach the basic techniques of electrical measurements.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. Analyze, design, and build DC and AC circuits.
 - 2. Analyze, design, and build simple amplifiers and signal filters.
 - 3. Analyze, design, and build simple digital circuits.
 - 4. Make accurate electrical measurements using a variety of tools, including digital multi-meters and oscilloscopes.
- B. General Education Learning Outcomes
 - 1. GELO #3: Critical Thinking & Problem Solving
 - 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. Fundamental principles of circuits, including Kirchhoff's Laws.
- B. Resistive circuits, including nodal, mesh, and equivalent circuit analysis.

- C. Inductance and capacitance.
- D. Steady-state sinusoidal analysis.
- E. Frequency response, bode plots, and resonance.
- F. Amplifiers, including operational amplifiers.
- G. Logic circuits.
- H. Diodes.

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s):
 - 1. Hambley, Allan R., *Electrical Engineering: Principles and Applications*, 6th Edition, Prentice Hall, 2014. ISBN: 978-0133116649.
 - 2. *ENGR2010 Lab Manual* (handout).
 - 3. Generic WebAssign Access Card.
- B. Other resources:
 - 1. Lab notebook (spiral-bound or permanently bound notebook).

VI. METHODS OF INSTRUCTION

- A. Methods of presentation typically include a combination of the following:
 - 1. Lectures
 - 2. Small group discussions
 - 3. Demonstrations
 - 4. Laboratory exercises

VII. METHODS OF EVALUATION

- A. Methods of evaluation typically include a combination of the following:
 - 1. Reading quizzes up to 5% extra credit
 - 2. Lecture 15%
 - 3. Laboratory 15%
 - 4. Homework 20%
 - 5. Exams 30% (10% each)
 - 6. Final exam 20%
- 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. Reading Assignments: You are required to read the appropriate sections of the textbook *before* each lecture class meeting, as indicated on the attached reading assignment list.
 - 1. Each lecture class period will begin with a brief reading quiz. These quizzes are strictly *extra credit* and are to encourage you to do the reading.
 - 2. You may not take the quiz if you arrive late.
- B. Lecture: All students are expected to attend class and participate in the group problem solving that will occur during each lecture class. Experience has shown that students who actively participate learn more and earn higher grades.
 - 1. Your lecture grade is based on attendance and doing group problem solving activities (full credit for participation).
 - 2. Missed lectures *cannot* be made up; however, your lowest *two* lecture scores will be dropped.
- C. Homework: There will be 15 homework assignments, about one each week.

1. You will access the assignments and also submit your answers on the Internet. See the attached sheet explaining the details.
 2. You may work with your classmates and seek help from any instructor.
 3. Homework *cannot* be made up, but you can give yourself a 24-hour extension (from the original due date and time). There is no penalty for extensions; however, *no extensions will be granted if you have already viewed the solutions.*
- D. Exams: There will be three exams plus a comprehensive final.
1. Exams will cover material from lecture, lab, homework, and the reading assignments.
 2. If there is a compelling reason that you cannot make it to an exam, you must inform your instructor *before* the exam. In case of an emergency, inform your instructor as soon as possible.
 3. Missed exams must be made up within *two days* of the original exam date; after that time, the exam is scored as a zero. *Students are responsible for making the arrangements with their instructor.*
 4. At the end of the quarter, *if you have taken all the exams*, your lowest exam score will be replaced with the Final Exam score, if it is higher.
- E. Laboratory: There will be 12 labs.
1. You may not start a lab if you arrive more than 15 minutes late.
 2. Your grade for each lab will be based on a pre-lab exercise (20%, handed in *before* the lab), doing the lab (30%), and also on a formal lab report (50%).
 3. Missed labs *cannot* be made up; however, your lowest lab score will be dropped.