

**Common Course Outline for: ENGR 2001 Circuit Analysis with Electronics****A. Course Description**

1. Number of credits: 5
2. Lecture hours per week: 4  
Lab hours per week: 2
3. Prerequisites: PHYS 1121 (C or better) and 1122 (C or better) or concurrent enrollment, MATH 1520 (C or better) and 2520 (C or better) or concurrent enrollment or consent of instructor.
4. Co-requisites: None
5. MnTC Goals: None

Physical principles underlying circuit element models. Resistive circuits, Kirchhoff's laws, independent and dependent sources, node-voltage and mesh-current methods, op-amps, inductors, and capacitors. First- and second-order circuits. Diodes, FETs, and elementary amplifiers. Experiments with simple circuits and electronics. Familiarization with measurement tools and equipment.

**B. Date last revised:** April 2017**C. Outline of Major Content Areas:** Basic circuit concepts, circuit theorems, operational amplifiers, RL, RC, and RLC circuits, diodes, fields effect transistors (FETs).**D. Course Learning Outcomes**

Upon successful completion of the course, the student will be able to:

1. Analyze circuits using Kirchhoff's laws and node-voltage and mesh-current methods.
2. Analyze circuits containing op-amps, inductors, and capacitors.
3. Analyze first- and second-order circuits.
4. Analyze and model circuits containing diodes, FETs, and elementary amplifiers.
5. Use measurement tools and equipment to perform experiments with simple circuits and electronics.

**E. Methods for Assessing Student Learning:** Evaluation methods are at the discretion of the instructor and may include exams, quizzes, homework, projects, and labs.**F. Special Information:**

**Relationship to ABET Accreditation Criteria:** To assist our transfer partner engineering programs in their ABET accreditation evaluations, this course teaches skills that help students achieve the following ABET outcomes:

- (a) An ability to apply knowledge of mathematics, science, and engineering
- (b) An ability to design and conduct experiments, as well as to analyze and interpret data
- (e) An ability to identify, formulate, and solve engineering problems
- (g) An ability to communicate effectively
- (i) A recognition of the need for, and an ability to engage in, life-long learning
- (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.