

Departmental Syllabus

Prepared by the Department of Engineering Sciences and Applied Technology

Date of Departmental Approval: August 28, 2017

Date approved by Curriculum and Programs: October 11, 2017

Effective: Fall 2018

1. **Course Number: ENR204 / ENR204L**
Course Title: Circuit Theory I / Circuit Theory I Laboratory
2. **Description:** This is the first of two courses that begin a student's preparation for a career in electronics and related fields. The course is structured for those interested in expanding their background into the world of electronics. The course focus is on DC and transient electric circuit analysis, use of computer-based circuit simulation, and operational amplifier circuits. Laboratory experiments reinforce course concepts, develop laboratory and measurement skills, and provide system-level understanding.
3. **Student Learning Outcomes** (instructional objectives, intellectual skills):
Upon successful completion of this course, students are able to do the following.
 - Demonstrate an understanding of charge, current, voltage, and power in DC circuits.
 - Demonstrate an understanding of the application of Ohm's Law and Kirchhoff's Laws to DC circuits.
 - Demonstrate an understanding of the application of loop/mesh and nodal analysis to DC circuits.
 - Analyze DC circuits using network theorems (Superposition, Thevenin's and Norton's Theorems).
 - Demonstrate an understanding of inductance and capacitance including time varying functions.
 - Analyze DC and transient circuits: RC, RL, and RLC circuits.
 - Utilize multimeters and oscilloscopes to measure electrical quantities safely and accurately.
 - Demonstrate an understanding of operational amplifier (op-amp) circuits.
 - Successfully apply computer-based circuit simulation to DC electric circuits.
4. **Credit(s):** 4 credits (3 class hours / 2 laboratory hours)
5. **Satisfies General Education Requirement:** No
6. **Prerequisite(s):** MAT250 (Calculus II), ENL108 (Critical Reading & Thinking) or satisfactory basic skills assessment scores
7. **Semester(s) Offered:** Fall
8. **Suggested General Guidelines for Evaluation:** The course grade is based on homework assignments; class work and participation; quizzes; one-hour exam(s); laboratory work and reports; and a final examination.
9. **General Topical Outline:**
 1. Charge, current, voltage, and power.
 2. Ohm's Law and Kirchhoff's Laws.
 3. Loop/mesh and nodal analysis.
 4. DC resistive circuit analysis using network theorems such as Superposition, Thevenin's Theorem, and Norton's Theorem.
 5. Inductance and capacitance, including time varying functions.
 6. DC and transient circuits: RC, RL, and RLC circuits.
 7. Multimeter and oscilloscope usage.
 8. Concepts of operational amplifier (op-amp) circuits.
 9. Computer-based circuit simulation.