EE-3010
Circuits and Instrumentation

Curricular Designation: EE: N/A  CpE: N/A

Catalog Description:
EE 3010 – Circuits and Instrumentation Designed for nonmajors. Covers the principles of electrical and electronic measurements, including DC, AC, semiconductor devices, amplifiers, and filtering. Credits: 3.0 Lec-Rec-Lab: (2-0-2) Semesters Offered: Fall, Spring, Summer Restrictions: May not be enrolled in one of the following Major(s): Electrical Engineering, Computer Engineering

Textbooks(s) and/or Other Required Materials:

Prerequisites by Topic:
1. None

Course Objectives:
1. Introduce the student to DC and steady-state AC circuits analysis techniques
2. Introduce the student to first-order transient circuits
3. Introduce the student to operational amplifiers and linear circuit applications
4. Introduce the student to digital circuits and computer based data acquisition
5. Familiarize the student with electrical instrumentation and measurement techniques

Topics Covered:
1. Introduction to circuit elements, Ohm’s Law, KCL and KVL
2. Series and Parallel
3. Nodal Analysis
4. Thevenin/Norton Equivalent Circuits
5. Superposition
6. Capacitance/Inductance
7. First Order Transient Circuits
8. Intro to Sinusoids and Phasors
9. Impedance and AC Circuit Analysis
10. Frequency Response
11. Ideal First Order Filters
12. Operational Amplifiers
13. Logic Circuits
14. Computer Based Instrumentation Systems

Relationship of the Course Content to Program Outcomes:

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<th>Outcome</th>
<th>Important</th>
<th>Moderately Important</th>
<th>Minimally Important</th>
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<tr>
<td>a an ability to apply knowledge of mathematics, science and engineering</td>
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<td>b an ability to design and conduct experiments, as well as to analyze and interpret data</td>
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<td>c an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, health and safety, manufacturability and sustainability</td>
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<td>d an ability to function on multi-disciplinary teams</td>
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<td>e an ability to identify, formulate and solve engineering problems</td>
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<td>f an understanding of professional and ethical responsibility</td>
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<td>g an ability to communicate effectively</td>
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<td>h the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context</td>
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<td>i a recognition of the need for, and an ability to engage in life-long learning</td>
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<td>j a knowledge of contemporary issues</td>
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<td>k the ability to use the techniques, skills, and modern engineering tools necessary for the practice of electrical engineering</td>
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Contribution of Course to Meeting Degree Requirements:
3 Credit Hours – Engineering Topics

Class/Laboratory Schedule (note: 1 hour = 50 minutes):
Lecture: 28 hours = 2 hours/week for 14 weeks
Laboratory: 28 hours = 2 hours/week for 14 weeks

Prepared by:
Glen Archer, Principal Lecturer, November 29, 2016