EE - 3131  
Electronics

Curricular Designation: EE: required  
CpE: required

Catalog Description:
EE 3131 – Electronics Covers the fundamentals of electronic devices and circuits; operational amplifiers, bipolar junction transistors, diodes, and MOSFETs. 
Credits: 4.0 Lec-Rec-Lab: (3-0-2)  
Semesters Offered: Fall, Spring, Summer 
Pre-Requisite(s): EE 2112 or EE 3010

Textbooks(s) and/or Other Required Materials:
Electronics by A.R. Hambley, Prentice Hall, 2nd ed.

Prerequisites by Topic:
1. Familiarity with the basic methods of circuit analysis

Course Objectives:
1. Familiarity with the physics and operation of electronic devices such as diodes, op-amps, BJTs and MOSFETs.
2. Familiarity with the analysis of electronic circuits using diodes, op-amps, BJTs and MOSFETs.

Topics Covered:
1. Review of Linear Circuits.
2. Operational Amplifiers, Op-Amp Applications, Differentiators, Integrators, non-ideal op-amps
3. Diodes, Diode Models, Diode Applications, Rectifiers, p-n Junction Diodes
4. Bipolar Junction Transistors, npn and pnp BJTs, Small-Signal Analysis
5. Field-Effect Transistors, JFETs, MOSFETs, Switching models of NMOS and PMOS FETs.
6. Linear and Switch mode circuit designs for voltage/current regulators and amplifiers.
7. Other semiconductor devices including but not limited to Opto-isolators, Silicon Controlled Rectifiers, Power Semiconductors, Thyristors, Transient Voltage Suppressors, Light Emitting Diodes, etc.
8. Use of computer modelling programs to aid in the design of circuits.
Relationship of the Course Content to Program Outcomes:

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<th>Outcome</th>
<th>Important</th>
<th>Moderately</th>
<th>Minimally</th>
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<tr>
<td>an ability to apply knowledge of mathematics, science and engineering</td>
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<td>an ability to design and conduct experiments, as well as to analyze and interpret data</td>
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<td>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>an ability to function on multi-disciplinary teams</td>
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<td>an ability to identify, formulate and solve engineering problems</td>
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<td>an understanding of professional and ethical responsibility</td>
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<td>an ability to communicate effectively</td>
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<td>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>a recognition of the need for, and an ability to engage in life-long learning</td>
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<td>a knowledge of contemporary issues</td>
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<td>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:

4 Credit Hours – Engineering Topics

Class/Laboratory Schedule (note: 1 hour = 50 minutes):
Lecture: 42 hours = 3 hours/week for 14 weeks
Lab: 22 hours = 2 hours/week for 11 weeks

Prepared by:
Duane Bucheger, Professor of Practice, January 23, 2017