Course Information
Course #: ELE 102 Analog Electronics
3 Credits
Fall 2019

Instructor Information

Course Description
In this course, students will study Analog Electronic devices, such as diodes, transistors and amplifiers. Amplifier bias circuits methods and switching applications are discussed. Operational amplifier circuits (op-amps), parameters and applications, oscillators, and power supply circuits are covered. Total of 60 hours of lecture.

Textbook and Course Materials

Student Learning Outcomes
• Understand solid state devices, such as semiconductors, diodes, transistors and amplifiers.
• Show a practical understanding of operational amplifiers applications.
• Calculate gain, input, and output impedances of linear and nonlinear amplifiers.
• Understand the theory and operation of oscillators, and regulated power supplies.
• Understand frequency effects, Bode diagrams and device datasheets.

Course Content Objectives
• Describe the basic characteristics and operations of diodes, and bipolar junction transistors (BJTs).
• Describe and analyze the operations of common-emitter, common-collector, and common-base amplifiers and identify various types of transistor package configurations.
• Describe the basic classifications for field-effect transistors (FETs) and the construction and operation of junction field-effect transistors (JFETs).
• Explain the operation of metal-oxide semiconductor field-effect transistors (MOSFETs).
• Describe the operation of FET linear amplifiers and discuss two switching applications of FETs.
• Multistage and Power amplifiers.
• List functions and configurations of operational amplifiers to include amplifiers, comparators, integrators, differentiators, filters, oscillators, and special-purpose amplifiers.
• List functions and configurations of timers, and voltage regulators.
• Understand the oscillator feedback theory and design.
• Define the basic specifications of a regulated power supply.
• Explain the operation and application of the most common power amplifiers and instrumentation amplifiers.

Definition of Credit Hour: Classroom Courses
To earn one academic credit at HCC, students are required to complete a minimum of 37.5 clock hours (45 fifty-minute academic hours) of coursework per semester. Those hours of coursework may be completed through a combination of hours in the classroom and hours outside the classroom. Certain courses may require more than the 37.5 minimum hours of coursework per credit. For most classes, students should expect to complete at least 2 hours of coursework outside of class for each hour of in-class coursework.

<table>
<thead>
<tr>
<th>Classwork type</th>
<th>Direct Faculty Instruction</th>
<th>Student Work Out of Classroom</th>
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</thead>
<tbody>
<tr>
<td>In-class lecture and discussion</td>
<td>45 hours</td>
<td></td>
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<tr>
<td>Reading</td>
<td>48 hours</td>
<td></td>
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<tr>
<td>Quiz/exam studying</td>
<td>12 hours</td>
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<tr>
<td>Reading question completion</td>
<td>8 hours</td>
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<tr>
<td>Paper writing</td>
<td>18 hours</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>45 hours</strong></td>
<td><strong>86 hours</strong></td>
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Services for students with disabilities: Students may receive reasonable accommodations if they have a diagnosed disability and present appropriate documentation. Students seeking accommodations are required to contact the Disability Support Services (DSS) office as early as possible. Students may contact a DSS staff member for an appointment at dss@hagerstowncc.edu or at 240-500-2530.