EE321   **Electronics (1) for non EE student**

**Catalog Data**

Diodes, clipping, clamping and rectification circuits, bi-polar junction transistor (BJT), BJT amplifiers, field-effect transistors (FET), FET amplifiers and operational amplifiers and their applications

Pre-requisites: EE 212 or EE303

**Textbook**

Electronic circuit analysis and design by D. Neamen.

**Reference**

1. Electronic Circuits by D. Schilling and Belove
2. Electronic Devices and Circuits by Bogart
3. Microelectronic circuits by Sedra and Smith
4. Modular series on solid-state devices by Gerold Neudeck and R. Pierret

**Course Objectives**

1. Ability to analysis, & modeling of nonlinear circuit elements such as transistors and diodes
2. To teach students analysis techniques (small-signal analysis) for nonlinear circuits and devices;
3. Ability to analyze BJT and FET transistor amplifiers that meets certain specifications
4. Ability to analyze operational amplifier circuits and use them in applications
5. Ability to analysis oscillator circuits

**Pre-Requisites by Topic**

1. Semiconductor theory
2. Electronic devices and circuits

**Topics**

1. Semiconductor Materials and Diodes   3 Hours
2. Diode Circuits   6 Hours
3. The Bipolar Junction Transistor   6 Hours
4. Basic BJT Amplifiers   6 Hours
5. The Field Effect Transistor   6 Hours
6. Basic FET Amplifiers   3 Hours
7. The Ideal Operational Amplifier   6 Hours
8. Non-ideal Effects in Analog Integrated circuit   3 Hours
9. Oscillators   3 Hours

**Computer Usage**

Pspice circuit simulation

**Estimated Content**

<table>
<thead>
<tr>
<th>Engineering Science</th>
<th>2.0 Credits</th>
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<tbody>
<tr>
<td>Engineering Design</td>
<td>1.0 Credits</td>
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**Prepared by**

Dr. Omar Qasaimeh

**Date**

2008.2.12
### Mapping of course (EE321) objectives to program outcomes

<table>
<thead>
<tr>
<th>Course Objective</th>
<th>Delivery Methods</th>
<th>Assessment Methods</th>
<th>(a)</th>
<th>(b)</th>
<th>(c)</th>
<th>(d)</th>
<th>(e)</th>
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<th>(g)</th>
<th>(h)</th>
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<th>(k)</th>
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<tbody>
<tr>
<td>1-Ability to analysis, &amp; modeling of nonlinear circuit elements such as transistors and diodes</td>
<td>Lectures, tutorials.</td>
<td>Homework, quizzes, Exams.</td>
<td>X</td>
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<tr>
<td>2. To teach students analysis techniques (small-signal analysis) for nonlinear circuits and devices.</td>
<td>Lectures, tutorials.</td>
<td>Homework, quizzes, Exams.</td>
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<td>3. Ability to analyze BJT and FET transistor amplifiers that meets certain specifications</td>
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<td>4. Ability to analyze operational amplifier circuits and use them in applications</td>
<td>Lectures, tutorials.</td>
<td>Homework, quizzes, Exams.</td>
<td>X</td>
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<tr>
<td>5. Ability to analysis oscillator circuits</td>
<td>Lectures, tutorials.</td>
<td>Homework, quizzes, Exams.</td>
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### ABET a–k Engineering and Technology program outcomes

(a) An ability to apply knowledge of mathematics, science, and engineering
(b) An ability to design and conduct experiments, to analyze and interpret data
(c) An ability to design a system, component, or process to meet desired needs
(d) An ability to function on multi-disciplinary teams
(e) An ability to identify, formulate, and solve engineering problems
(f) An understanding of professional and ethical responsibility
(g) An ability to communicate effectively
(h) The broad education necessary to understand the impact of engineering solutions in a global and societal context
(i) A recognition of the need for, and an ability to engage in life-long learning
(j) A knowledge of contemporary issues
(k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice