Digital Electronic Circuits

Catalog Data

Digital electronic circuits (3-0-3) - 3 credits


Textbook


Reference


Coordinator

Dr. Omar Qasaimeh

Course Objectives

1. Ability to apply basic electronic circuit rules in digital logic gates.
2. Ability to analyze and design logic gates.
3. Ability to analyze and design multivibrators.
4. Ability to analyze and design sweep and timing circuits.
5. Ability to analyze and design the A/D and D/A converters.

Pre-Requisites by Topic

1. Semiconductor Theory and Devices
2. Electronic Circuits Analysis

Topics

1. Introduction to diode, BJT and MOSFET circuit as a switch
   5 Hours
2. Diode and BJT logic gates and output stages, analysis and design
   10 Hours
3. PMOS, NMOS and CMOS logic gates, analysis and design
   6 Hours
4. Current and voltage sweep circuits, analysis and design
   5 Hours
5. Bistable, monostable and astable multivibrator circuit analysis and design
   5 Hours
6. Comparator and Schmitt Trigger circuit analysis and applications
   3 Hours
7. A 555 Timer and its applications in the timing circuit's application.
   3 Hours
8. Analog to digital and digital to analog converters
   5 Hours

Computer Usage

PSpice Circuits Simulation

Estimated Content

- Engineering Science 3.0 Credits
- Engineering Design 0.0 Credits

Prepared by

Dr. Omar Qasaimeh

Date

15.9.2008
<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>
<th>(f)</th>
<th>(g)</th>
<th>(h)</th>
<th>(i)</th>
<th>(j)</th>
<th>(k)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ability to apply basic electronic circuit rules in logic gates</td>
<td>Lectures, tutorials.</td>
<td>Homework, quizzes, Exams.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>2. Ability to analyze and design the logic gates</td>
<td>Lectures, tutorials.</td>
<td>Homework, quizzes, Exams.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Ability to analyze and design multivibrators circuit.</td>
<td>Lectures, tutorials.</td>
<td>Homework, quizzes, Exams.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Ability to analyze and design the A/D and D/A convertors.</td>
<td>Lectures, tutorials.</td>
<td>Homework, quizzes, Exams.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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