Course Specifications

University: Benha University
Faculty: Benha Faculty of Engineering

Course specifications
Programme(s) on which the course is given: Control and measurements Dep.
Major or minor element of programmes: Major
Department offering the programme: Electrical Engineering technology Dep.
Department offering the course: Electrical Engineering technology Dep.
Academic year / Level: fourth year
Date of specification approval: 2009

A- Basic Information
Title: Electronics Circuit Design
Code: E401
Credit Hours: N.A.
Lecture: 3
Tutorial: 2
Practical: 2
Total: 7

B- Professional Information
1 - Overall aims of course
By the end of this course the, the student will gain the following:

Understand RF amplifier, to know the difference between power amplifier and tuned amplifier. Know the types modulation and detection circuits. Recognize the types of oscillators, active filters and capacitive filter. Know the types of waveform generators; understand the theory of A/D and D/A converters. Deal with telecommunication circuits.

2- Intended learning outcomes of course (ILOs)
a. Knowledge and understanding:

- Explain different types of amplifiers used in communication circuits.
- Describe telecommunication circuits and how to operate like oscillators, modulators and detectors.
- Define A/D and D/A theory of operation and its circuits.
- Explain how to generate certain waveform.
b. Intellectual skill

- Suggest types of amplifiers used in communication systems.
- Modify modulation and detection circuits.
- Modify oscillators and filters circuits.
- Define A/D and D/A theory of operation and its circuits.

c. Professional and practical skills

c.1 Design amplifiers used in communication system;

c.2 Diagnose the modulator and detector;

c.3 Design the generator of carrier signal;

c.4 Design types of filters used in any communication system;

c.5 Diagnose A/D and D/A converters;

d. General and transferable skills

d.1 Work cooperatively and effectively in a group

d.2 Find information independently

3- Contents

<table>
<thead>
<tr>
<th>Topic</th>
<th>No. of Hours</th>
<th>Lecture</th>
<th>Tutorial/Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power amplifier and tuned amplifier</td>
<td>14</td>
<td>6</td>
<td>4/4</td>
</tr>
<tr>
<td>RF amplifiers</td>
<td>7</td>
<td>3</td>
<td>2/2</td>
</tr>
<tr>
<td>Modulation and detection circuits</td>
<td>14</td>
<td>6</td>
<td>4/4</td>
</tr>
<tr>
<td>oscillators;</td>
<td>9</td>
<td>3</td>
<td>4/2</td>
</tr>
<tr>
<td>Active filters</td>
<td>8</td>
<td>6</td>
<td>-/2</td>
</tr>
<tr>
<td>Switched mode , capacitor filters</td>
<td>8</td>
<td>6</td>
<td>-/2</td>
</tr>
<tr>
<td>Waveform generators</td>
<td>11</td>
<td>3</td>
<td>4/4</td>
</tr>
<tr>
<td>Timing circuits</td>
<td>5</td>
<td>3</td>
<td>2/2</td>
</tr>
<tr>
<td>A/D and D/A conversion</td>
<td>11</td>
<td>3</td>
<td>4/4</td>
</tr>
<tr>
<td>Telecommunication circuits</td>
<td>11</td>
<td>3</td>
<td>4/4</td>
</tr>
<tr>
<td>total</td>
<td>98</td>
<td>42</td>
<td>28/28</td>
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</tbody>
</table>
4- **Teaching and learning methods**

4.1- Lectures  
4.2- Tutorials  
4.3- Practice in Laboratories  
4.4- Internet collected information and Self-study projects

5- **Student assessment methods**

5-1 Written exams (Final and Midterm), assignments and quizzes to assess knowledge and understanding, solving problems skills and interpretation capabilities of physical phenomena.  
5-2 Oral exams to assess the abilities of discussing physical concepts  
5-3 Practical exam to assess measuring and professional skills

**Assessment schedule**

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Week No.</th>
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<tbody>
<tr>
<td>Quiz 1</td>
<td>4</td>
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<tr>
<td>Midterm</td>
<td>8</td>
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<tr>
<td>Quiz 2</td>
<td>12</td>
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<tr>
<td>Oral and Practical exam</td>
<td>14</td>
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<tr>
<td>Final written exam</td>
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</table>

**Weighting of assessments**

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-term examination</td>
<td>12%</td>
</tr>
<tr>
<td>Oral and Practical examination</td>
<td>20%</td>
</tr>
<tr>
<td>Semester work</td>
<td>8%</td>
</tr>
<tr>
<td>Final-term examination</td>
<td>60%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

6- **List of references**

6.1- Lecture notes  
6.2- Essential book  

Electronic Communication Techniques (4th Edition) by Paul H. Young  
6.3- Recommended books
1. Electronic Communication by Robert Shrader

2. Modern Electronic Communication by Jeff Beasley, Gary M. Miller, Jeff Beasley

7- Facilities required for teaching and learning
   Lecture rooms – Tutorial section rooms – Experimental Labs - computers – Virtual simulation programs

Course coordinator:
Head of Department: Assoc. Prof. Ghada Amer
Date: