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: Third year
Date of specification approval: 2008

A- Basic Information
Title: Microelectronics  Code: E301
Credit Hours: N.A.  Lecture: 2
Tutorial: 1  Practical: 2  Total: 5

B- Professional Information

1 - Overall aims of course
Upon successful completion of this course, the student should be gain the following:


2- Intended learning outcomes of course (ILOs)

a. Knowledge and understanding:
   a. Illustrate diodes operation and applications
   b. Illustrate BJT operation and applications
   c. Illustrate FET operation and applications
b. Intellectual skills
By the end of this course, the student should be able to:
   a. Solve problems related to physics of semiconductor devices

c- Professional and practical skills
   a. Design practical circuits

d- General and transferable skills
By the end of this course, the student should be able to:
   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>Physics of semiconductor</td>
<td>5</td>
<td>2</td>
<td>½</td>
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<tr>
<td>PN junction and applications</td>
<td>5</td>
<td>2</td>
<td>½</td>
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<tr>
<td>Diode applications</td>
<td>5</td>
<td>2</td>
<td>½</td>
</tr>
<tr>
<td>Bipolar junction transistors</td>
<td>10</td>
<td>4</td>
<td>2/4</td>
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<tr>
<td>Junction FETs</td>
<td>10</td>
<td>4</td>
<td>2/4</td>
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<tr>
<td>MOSFETs</td>
<td>5</td>
<td>2</td>
<td>½</td>
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<tr>
<td>FETs applications</td>
<td>5</td>
<td>2</td>
<td>½</td>
</tr>
<tr>
<td>Basic transistor amplifier circuits</td>
<td>10</td>
<td>4</td>
<td>2/4</td>
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<tr>
<td>The Darlington transistor</td>
<td>5</td>
<td>2</td>
<td>½</td>
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<tr>
<td>Analysis of the basic logic gates</td>
<td>10</td>
<td>4</td>
<td>2/4</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>28</td>
<td>42</td>
</tr>
</tbody>
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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

- Quiz 1 .......................... Week No. 4
- Midterm .......................... Week No. 8
- Quiz 2 .......................... Week No. 12
- Oral and Practical exam ......... Week No. 14
- Final written exam ............. Week No. 15

Weighting of assessments

- Mid-term examination 12%
- Final-term examination 60%
- Oral and Practical examination 20%
- Semester work 8%
- Total 100%

6- List of references

6.1- Coerce notes

6.2- Essential books (text books)

6.3- Recommended books
   - Microelectronics Circuits, A.Sedra & K.Smith, Latest edition

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: