Course Specifications

University: Benha University  Faculty: Benha Faculty of Engineering

Course specifications
Program(s) on which the course is given: Control and Measurements Dep.
Major or minor element of programs: Major
Department offering the program: Electrical Engineering technology Dep.
Department offering the course: Electrical Engineering technology Dep.
Academic year / Level: Forth year
Date of specification approval: 2009

A- Basic Information
Title: Electronic Measurements  Code: E432
Credit Hours: N.A.  Lecture: 3
Tutorial: 0  Practical: 4  Total: 7

B- Professional Information
1 - Overall aims of course
This is a course in basics of digital instruments. It provides grounding in the time base, amplified DC meter, AC voltmeter. Electronic multimeter, digital voltmeters, digital current and resistance measurements, the Q-meter, distortion analyzer, RF power and voltage measurements. Cathode-Ray Oscilloscope (CRO): Block diagram, CRT, Multiple trace oscilloscopes. Signal generators. Signal analysis. Frequency synthesizers.

2- Intended learning outcomes of course (ILOs)
a- Knowledge and understanding:
On successful completion of the module the student should:

- Define the principles of operation of the DC and AC meters.
- Be able to list the instrumentation and measurement systems.
- Illustrate the characteristics of the Cathode-Ray Oscilloscope.
- Be able to list realistic circuits for the signal generators.

b- Intellectual skills
By the end of this course, the student should be able to:
• Compare between the DC and AC meters.
• Analyze the instrumentation and measurement systems.
• Suggest realistic circuits for the signal generators.

c- Professional and practical skills
By the end of this course, the student should be able to:
• Perform different measurements on basic instruments.
• Perform simple Lab experiments.
• Collect information from collected data in the lab.

d- General and transferable skills
By the end of this course, the student should be able to:
• Work cooperatively and effectively in a group
• Present information independently

3- Contents

<table>
<thead>
<tr>
<th>Topic</th>
<th>No. of Hours</th>
<th>Lecture</th>
<th>Tutorial/Practical</th>
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<tbody>
<tr>
<td>Introduction</td>
<td>7</td>
<td>3</td>
<td>0/4</td>
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<tr>
<td>DC and AC meters</td>
<td>14</td>
<td>6</td>
<td>0/8</td>
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<tr>
<td>Electronic multimeter</td>
<td>14</td>
<td>6</td>
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<tr>
<td>Digital voltmeters, digital current and resistance measurements</td>
<td>14</td>
<td>6</td>
<td>0/8</td>
</tr>
<tr>
<td>The Q-meter, distortion analyzer, RF power and voltage measurements</td>
<td>14</td>
<td>6</td>
<td>0/8</td>
</tr>
<tr>
<td>Cathode-Ray Oscilloscope (CRO)</td>
<td>14</td>
<td>6</td>
<td>0/8</td>
</tr>
<tr>
<td>Signal generators, signal analysis, frequency synthesizers</td>
<td>21</td>
<td>9</td>
<td>0/12</td>
</tr>
<tr>
<td>Total</td>
<td>98</td>
<td>42</td>
<td>0/56</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
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
Final-term examination 60%
Semester work 20%
Oral Examination 20%
Total 100%

6- List of references
- Recommended books
  1. Electronic instrumentation and measurements, by David A. Bell

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

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