



**University/Academy:** Arab Academy for Science & Technology and Maritime Transport  
**College:** Computing and Information Technology  
**Program:** B. Sc. in Computer Science / Information Systems/ Software Engineering

**Form no. (12)**  
**Course Specification**

**1- Course Data**

<b>Course Code</b> EC134	<b>Course Title:</b> Fundamentals of Electricity and Electronics.	<b>Academic Year/Level:</b>  1/2
<b>Specialization:</b>  Electronics & Communications Eng.	<b>No. of Instructional Units:</b>	<input type="checkbox"/> Lecture <input type="checkbox"/> Practical <input type="checkbox"/> Tutorial

<b>2- Course Aim</b>	Introducing the basic concept of electric circuits as well as different electronic devices used in constructing modern electronic circuits: diodes – bipolar junction transistor, field effect transistor and operational amplifiers. Studying the performance with special emphasis on some practical applications.
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**3- Intended Learning Outcome**

<b>a-Knowledge and Understanding</b>	<p><b>K6. The current and underlying technologies that support computer processing and inter-computer communication.</b></p> <ul style="list-style-type: none"> <li>◆ Students will be able to <b>examine</b> basic knowledge, concepts of mathematics and sciences and physics with accuracy 80%.</li> <li>◆ The student must be able to <b>know</b> all electrical units and different measuring devices using 1 assignment and a written exam.</li> <li>◆ The student must be able to <b>describe</b> the concepts of basic DC circuits by submitting 2 assignments.</li> <li>◆ The student must be able to <b>describe</b> the concept of DC circuit analysis by submitting 1 assignment.</li> <li>◆ The student must be able to <b>describe</b> the concept of the basics of AC current by submitting 1 assignment.</li> <li>◆ The student must be able to <b>examine</b> the knowledge of RLC circuits and</li> </ul>
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	<p>power in AC circuits by submitting 3 assignments.</p> <ul style="list-style-type: none"> <li>◆ Student will be able to <b>examine</b> the knowledge of impedance matching using 2 assignments.</li> <li>◆ The student must be able to <b>describe</b> the concept of P-n junction diode by submitting 3 assignments.</li> <li>◆ The student must be able to <b>describe</b> the concept of P-n junction diode by submitting 3 assignments.</li> <li>◆ Student will be able to <b>examine</b> the knowledge, analyze and design special diodes using 2 assignments.</li> <li>◆ The student must be able to <b>define</b> the performance of BJT using 3 assignments and 2 written exams.</li> <li>◆ The student must be able to <b>define</b> the performance of BJT using 3 assignments and 2 written exams.</li> <li>◆ The student must be able to <b>show</b> the concept of solving FET problems using 3 assignments.</li> <li>◆ The student must be able to <b>describe</b> the performance of Amplifiers using 2 assignments and 1 written exam.</li> <li>◆ The student must be able to <b>examine</b> the functionality of oscillators using a single assignment and a written exam.</li> </ul>
<p><b>b- Intellectual Skills</b></p>	<p><b>I2. Realize the concepts, principles, theories and practices behind computing and information as an academic discipline.</b></p> <ul style="list-style-type: none"> <li>◆ Students will be able to <b>demonstrate</b> appropriate knowledge and methods of P-n Junction diode using a student seminar.</li> <li>◆ Students will be able to <b>adapt</b> computer programs using Pspise.</li> <li>◆ Students will be able to <b>solve, examine</b> and explain data using a written exam and an essay.</li> </ul>
<p><b>c- Professional Skills</b></p>	<p><b>P1. Operate computing equipment, recognizing its logical and physical properties, capabilities and limitations.</b></p> <p><b>P7. Assess the implications, risks or safety aspects involved in the operation of computing equipment within a specific context.</b></p> <ul style="list-style-type: none"> <li>◆ Students will be able to <b>explain</b> appropriate analysis 1 report.</li> <li>◆ Students will be able to <b>perform</b> a diode circuit using 1 assignment and 1 lab report.</li> <li>◆ Students will be able to <b>experiment</b> with special diodes and test a system using 2 lab reports.</li> <li>◆ Students will be able to <b>manipulate</b> appropriate mathematical methods to solve FET problems.</li> </ul>
<p><b>d- General Skills</b></p>	<p><b>G1. Demonstrate the ability to make use of a range of learning resources and to manage one's own learning.</b></p> <p><b>G6. Reveal communication skills, public speaking and presentation skills, and delegation, writing skills, oral delivery, and effectively using</b></p>

	<p>various media for a variety of audiences.</p> <ul style="list-style-type: none"> <li>◆ The students will be able to <b>practice</b> experience and facility in systematic approaches to solve problems using professional skills.</li> <li>◆ The student will be able to <b>comply</b> with the applications of BJT concepts using a written group project.</li> <li>◆ The student must be able to <b>practice</b> solving FET problems using 3 lab reports.</li> <li>◆ The students will be able to <b>communicate</b> effectively using an oral group project.</li> <li>◆ The student must be able to <b>comply</b> the learning on how to deal with oscillators using professional discussions.</li> </ul>
<b>4- Course Content</b>	<ul style="list-style-type: none"> <li>• Basic Physical Concepts.</li> <li>• Electrical Units &amp; Measuring Devices.</li> <li>• Basic dc circuits.</li> <li>• Direct –Current Circuit Analysis.</li> <li>• Alternating Current Basics.</li> <li>• RLC Circuit Analysis –Power &amp; Resonance in AC Circuits.</li> <li>• Transformers and Impedance Matching.</li> <li>• Introduction to Semiconductors.</li> <li>• Some Uses Of Diodes</li> <li>• Bipolar Junction Transistor (BJT)</li> <li>• Field Effect Transistor (FET).</li> <li>• Amplifiers.</li> <li>• Oscillators.</li> </ul>
<b>5- Teaching and Learning Methods</b>	<ul style="list-style-type: none"> <li>- Lectures</li> <li>- Tutorials</li> <li>- Reports &amp; sheets</li> <li>- Laboratories</li> <li>- Seminars</li> </ul>
<b>6-Teaching and Learning Methods for Students with Special Needs</b>	<ul style="list-style-type: none"> <li>• Students with special needs are requested to contact the college representative for special needs ( currently Dr Hoda Mamdouh in room C504)</li> <li>• Consulting with lecturer during office hours.</li> <li>• Consulting with teaching assistant during office hours.</li> <li>• Private Sessions for redelivering the lecture contents.</li> <li>• For handicapped accessibility, please refer to program specification.</li> </ul>
<b>7- Student Assessment:</b>	
<b>a- Procedures used:</b>	<ul style="list-style-type: none"> <li>-Written Exams</li> <li>-Oral Exams</li> <li>-Lab work and mini projects</li> <li>-Class activities</li> </ul>

<b>b- Schedule:</b>	Assessment 1 ( 7 <sup>th</sup> and 12 <sup>th</sup> Week Written Exam) Assessment 2 ( 7 <sup>th</sup> and 12 <sup>th</sup> Week oral Exam ) Assessment 3 ( 7 <sup>th</sup> and 12 <sup>th</sup> Week practical Exam) Assessment 4 ( continuous assessment ) Assessment 5 ( 16 <sup>th</sup> week Final Exam )												
<b>c- Weighing of Assessment:</b>	<table> <tr> <td>Assessment 1</td> <td>40%</td> </tr> <tr> <td>Assessment 2</td> <td>5%</td> </tr> <tr> <td>Assessment 3</td> <td>10%</td> </tr> <tr> <td>Assessment 4</td> <td>5%</td> </tr> <tr> <td>Assessment 5</td> <td>40%</td> </tr> <tr> <td>Total</td> <td>100%</td> </tr> </table>	Assessment 1	40%	Assessment 2	5%	Assessment 3	10%	Assessment 4	5%	Assessment 5	40%	Total	100%
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Assessment 2	5%												
Assessment 3	10%												
Assessment 4	5%												
Assessment 5	40%												
Total	100%												
<b>8- List of References:</b>													
<b>a- Course Notes</b>													
<b>b- Required Books (Textbooks)</b>	Floyd, " Electronics Fundamentals, Circuits, Devices and Applications" Boylested, Nashelsky, Electronic Devices & circuit theory												
<b>c- Recommended Books</b>	Stan Gibilisco, Teach Yourself Electricity and Electronics, McGraw Hill. Mc Comb and Earl Boysen; Electronics for Dummies; John Wiley, Inc, 2005. Paul Horowitz and Winfield Hill; The Art of Electronics; Second Edittion, Cambridge, 1989. Forrest M. Mims; Getting Started in Electronics; Master Publishing, INC, 2003. Boylestad, Nashelsky, Electronic Devices and Circuit Theory, 1991.												
<b>d- Periodicals, Web Sites, ..., etc.</b>													

**Course Instructor**

Name:

Signature:

**Head of Department**

Name:

Signature: