



**University/Academy:** Arab Academy for Science, Technology & Maritime Transport  
**Faculty/Institute:** College of Engineering & Technology  
**Program:** Industrial Engineering

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

**1- Course Data**

<b>Course Code:</b> EE 236	<b>Course Title:</b> Electrical Engineering (I)	<b>Academic Year/Level:</b> 2
<b>Specialization:</b> Industrial Eng	<b>No. of Instructional Units:</b> 3	<b>Lecture</b> 2 <b>tutorial</b> 2

**2- Course Aim**

The course aims to give the students a good background of electric and magnetic circuit fundamentals, power calculation and polyphase circuits.

**3- Intended Learning Outcome**

**a- Knowledge and Understanding**

Ability to:

**1.a Concepts and theories of mathematics and sciences, appropriate to the discipline**

- Listing electric circuits components.
- Definition of Ohm's law and Kirchoff's laws.
- Identification between concepts of series and parallel circuits
- Showing alternating current (AC) circuit components.
- Power calculation in three phase circuits.

**1.e Methodologies of solving engineering problems, data collection and interpretation**

- Distinguishing electrical network theorems.
- Knowing magnetic field and magnetic circuits.
- Describing analysis of three phase circuits.

<b>b- Intellectual Skills</b>	<p>Ability to:</p> <p><b>2.b Select appropriate solutions for engineering problems based on analytical thinking</b></p> <ul style="list-style-type: none"> <li>• Select the appropriate methods to analysis and solve electric circuits.</li> </ul> <p><b>2.g Solve engineering problems, often on the basis of limited and possibly contradicting information</b></p> <ul style="list-style-type: none"> <li>• Calculate the electric power</li> </ul> <p><b>I2 Identify and formulate engineering problems and apply their knowledge of mathematics, science and engineering tools along with creativity skills to solve problems in the field of electric power, machines and control Engineering:</b></p> <ul style="list-style-type: none"> <li>• Examine magnetic circuit and its relation to electric circuits</li> </ul> <p><b>I3 1-Analyze complex electrical power, machines, electric drives and automatic control systems</b></p> <ul style="list-style-type: none"> <li>• Apply mathematical and graphical techniques for solving electric circuits</li> </ul>
<b>c- Professional Skills</b>	<p>Ability to:</p> <p><b>3.a Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems</b></p> <ul style="list-style-type: none"> <li>• Understand the behavior of direct and alternating current circuits.</li> </ul> <p><b>3.f Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs</b></p> <p><b>P1 Design and perform experiments as well as analyze and interpret experimental results related to electrical power and machines and control system:</b></p> <ul style="list-style-type: none"> <li>• Measure current, voltage and power in electric circuit.</li> </ul> <p><b>P21- Use laboratory equipment to obtain data</b></p> <ul style="list-style-type: none"> <li>• Perform laboratory experiments to verify various electric circuits' theory.</li> <li>• Use computer in solving basic electric circuits.</li> </ul>
<b>d- General Skills</b>	<p>Ability to:</p> <p><b>4a Collaborate effectively within multidisciplinary team</b></p> <ul style="list-style-type: none"> <li>• Communicate effectively with colleagues and others to interchange knowledge and information in digital control system design.</li> <li>• Work individually and in a small group to perform laboratory experiments and tutorial exercises in electric engineering fundamentals.</li> <li>• Prepare effective technical reports and present data</li> </ul>

	<p>on electrical engineering.</p>
<p><b>4- Course Content</b></p>	<p><i>Week Number 1:</i> Basic d-c circuit elements, series and parallel network.</p> <p><i>Week Number 2:</i> Resistance, Voltage, current, Ohm's law and Kirchoff's laws.</p> <p><i>Week Number 3:</i> Resistances in series or parallel, current divider and voltage divider.</p> <p><i>Week Number 4:</i> Nodal analysis</p> <p><i>Week Number 5:</i> Mesh analysis</p> <p><i>Week Number 6:</i> Laws of magnetic force</p> <p><i>Week Number 7:</i> 7th week exam + Field strength, flux density, relation between B, H, I, K</p> <p><i>Week Number 8:</i> Magnetic circuits</p> <p><i>Week Number 9:</i> Alternating currents, waves, effective, mean values.</p> <p><i>Week Number 10:</i> RL, RC circuits, power calculation..</p> <p><i>Week Number 11:</i> Analysis of A-C networks.</p> <p><i>Week Number 12:</i> 12th week exam + Analysis of three phase circuits</p> <p><i>Week Number 13:</i> Analysis of three phase circuits (1).</p> <p><i>Week Number 14:</i> Analysis of three phase circuits (2).</p> <p><i>Week Number 15:</i> Analysis of three phase circuits (3).</p> <p><i>Week Number 16:</i> Final</p>

<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> </ul>														
<b>6- Teaching and Learning Methods for Students with Special Needs</b>	<ul style="list-style-type: none"> <li>- Lectures</li> <li>- Tutorials</li> <li>- Reports &amp; sheets</li> <li>- Laboratories</li> </ul>														
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<b>8- List of References:</b>	<ul style="list-style-type: none"> <li>▪ A. B Carlson, "Circuits, Engineering Concepts and Analysis of Linear Electric Circuits", John Wiley, 2000</li> <li>▪ R.L. Boylestad, "Introductory Circuit Analysis", Merrill, London, 1994.</li> <li>▪ W. J. Hayt and J. E. Kemmerly, "Engineering Circuit Analysis", McGraw Hill Int. Edition, 1986.</li> <li>▪ D. E. Johnson, J. R. Johnson and J.L. Hilburn,</li> </ul>														

	“Electric Circuit Analysis”, Prentice Hall, N. J. 1992.
<b>a- Course Notes</b>	
<b>b- Required Books (Textbooks)</b>	J. Nilsson & S. Riedel, “Electrical Circuits”, Prentice Hall, latest edition
<b>c- Recommended Books</b>	
<b>d- Periodicals, Web Sites, ..., etc.</b>	

**Course Instructor:**

**Head of Department:**

**Program Manager:**