



**University/Academy:** Arab Academy for Science and Technology & Maritime Transport  
**Faculty/Institute:** College of Engineering & Technology  
**Program:** Electrical and Control Engineering

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

**1- Course Data**

<b>Course Code:</b> EE 311	<b>Course Title:</b> <b>Fundamental of Control Engineering</b>	<b>Academic Year/Level:</b> 3
<b>Specialization:</b> Electrical and Control Engineering	<b>No. of Instructional Units:</b> 3	<b>Lecture</b> 2 <b>Practical</b> 2 <b>Lab</b> 2

<b>2- Course Aim</b>	To present and introductory yet comprehensive definition of terms and mathematical tools used in the study of control.
<b>3- Intended Learning Outcome</b>	
<b>a- Knowledge and Understanding</b>	<p>A.5 Methodologies of solving engineering problems, data collection and interpretation</p> <p>A.13 Analytical and computer methods appropriate for electrical power and machines engineering.</p> <p>A.15 Principles of operation and performance specifications of electrical and electromechanical engineering systems</p> <p>A.27 Analysis, design and implementation of various methods of control using analogue and digital control systems</p> <p>A.31 Formulate the problem, realizing the requirements and identifying the constraints</p>

<b>b- Intellectual Skills</b>	<p>B.1 Select appropriate mathematical and computer-based methods for modeling and analyzing problems</p> <p>B.8 Select and appraise appropriate ICT tools to a variety of engineering problems</p> <p>B.16 Analyze the performance of electric power generation, control and distribution systems</p> <p>B.19 Design computer programs to analyze and simulate different electrical systems components and control applications</p>
<b>c- Professional Skills</b>	<p>C.1 Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems</p> <p>C.5 Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results</p> <p>C.6 Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs</p> <p>C.13 Design and perform experiments, as well as analyze and interpret experimental results related to electrical power and machines systems</p> <p>C.14 Use laboratory and field equipment competently and safely</p> <p>C.15 Integrate electrical, electronic and mechanical components and equipment with transducers, actuators and controllers in creatively computer controlled systems</p> <p>C.16 Specify and evaluate manufacturing of components and equipment related to electrical power and machines</p> <p>C.18 Test and examine components, equipment and systems of electrical power and machines and control engineering</p>
<b>d- General Skills</b>	<p>D.1 Collaborate effectively within multidisciplinary team</p> <p>D.3 Communicate effectively</p> <p>D.4 Demonstrate efficient IT capabilities</p>

<b>4- Course Content</b>	<i>Week Number 1:</i> Modeling of systems. <i>Week Number 2:</i> Open loop systems. <i>Week Number 3:</i> Closed loop systems. <i>Week Number 4:</i> Block diagram reduction. <i>Week Number 5:</i> Signal flow graph techniques. <i>Week Number 6:</i> Transfer function. <i>Week Number 7:</i> Modeling of some electrical circuits. <i>Week Number 8:</i> System properties. <i>Week Number 9:</i> Error analysis and system type. <i>Week Number 10:</i> Stability analysis. <i>Week Number 11:</i> Time response of 1 <sup>st</sup> and 2 <sup>nd</sup> order. <i>Week Number 12:</i> Concept of poles and zeros. <i>Week Number 13:</i> Analysis & simple electromech. <i>Week Number 14:</i> Improving system response. <i>Week Number 15:</i> Analysis of higher order. <i>Week Number 16:</i> Final Exam.														
<b>5- Teaching and Learning Methods</b>	<ul style="list-style-type: none"> <li>- Lectures</li> <li>- Tutorials</li> <li>- Practical Training</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>- Practical Training</li> </ul>														
<b>7- Student Assessment:</b>															
<b>a- Procedures used:</b>	<p>Quizzes to assess the 7<sup>th</sup> week evaluation</p> <p>Quizzes to assess the 12<sup>th</sup> week evaluation</p> <p>Matlab code to asses class activities</p>														
<b>b- Schedule:</b>	<table border="0"> <tr><td>Assessment 1</td><td>4<sup>th</sup> Week</td></tr> <tr><td>Assessment 2</td><td>5<sup>th</sup> Week</td></tr> <tr><td>Assessment 3</td><td>6<sup>th</sup> Week</td></tr> <tr><td>Assessment 4</td><td>7<sup>th</sup> Week</td></tr> <tr><td>Assessment 5</td><td>11<sup>th</sup> Week</td></tr> <tr><td>Assessment 6</td><td>12<sup>th</sup> Week</td></tr> <tr><td>Assessment 7</td><td>13<sup>th</sup> Week</td></tr> </table>	Assessment 1	4 <sup>th</sup> Week	Assessment 2	5 <sup>th</sup> Week	Assessment 3	6 <sup>th</sup> Week	Assessment 4	7 <sup>th</sup> Week	Assessment 5	11 <sup>th</sup> Week	Assessment 6	12 <sup>th</sup> Week	Assessment 7	13 <sup>th</sup> Week
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<b>8- List of References:</b>	Ogata , "Modern control Engineering", Prentice – Hall , 1985														
<b>a- Course Notes</b>															
<b>b- Required Books (Textbooks)</b>	Benjamin C. Kuo, "Automatic Control Systems", Prentice Hall, Inc.														

<b>c- Recommended Books</b>	
<b>d- Periodicals, Web Sites, ..., etc.</b>	

**Course Instructor**

Name: **Dr. Mostafa Abdel geleil**

Signature:

**Head of Department**

Name: **Prof. Hamdy Ashour**

Signature:

**Dean of College of Engineering and Technology of  
AASTMT**

Name: **Prof. Moustafa Hussein Aly**

Signature:

**Executive Manager of Quality Assurance  
Center of AASTMT**

Name: **Prof. Aziz Ezzat**

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