



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

Course Code: EE 321	Course Title: Electrical Machines (1)	Academic Year/Level: 3
Specialization: Electrical and Control Engineering	No. of Instructional Units: 3	Lecture 2 Tutorial /Practical 2

2- Course Aim	<ul style="list-style-type: none"> To study the Electro-mechanical energy conversion. To investigate the analysis and design of magnetic circuits. To investigate the construction of DC machines and its different types. To study the generation of DC Voltage and DC generators applications. To study the performance of DC motors and their starting, speed control and braking techniques.
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3- Intended Learning Outcomes

a- Knowledge and Understanding	<p>A.4 Principles of design including elements design, process and/or a system related to specific disciplines</p> <p>A.5 Methodologies of solving engineering problems, data collection and interpretation</p> <p>A.8 Current engineering technologies as related to disciplines</p> <p>A.26 Design and analysis of power system generation, transmission and distribution</p> <p>A.27 Analysis, design and implementation of various methods of control using analogue and digital control systems</p> <p>A.28 Applications of industrial automated systems for electrical and control engineering</p> <p>A.29 Understand the principle and design of power electronic and drive system</p> <p>A.31 Formulate the problem, realizing the requirements and identifying the constraints</p>
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	A.32 Know the modern renewable energy systems
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b- Intellectual Skills	B.11 Analyze results of numerical models and assess their limitations
c- Professional Skills	<p>C.3 Create and/or re-design a process, components or system, and carry out specialized engineering designs</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.18 Test and examine components, equipment and systems of electrical power and machines and control engineering</p>
d- General Skills	<p>D.1 Collaborate effectively within multidisciplinary team</p> <p>D.6 Effectively manage tasks, time, and resources</p>

<p>4- Course Content</p> <p>According to Course Matrix (Form 11a), Course File Summary (ISO MPC 3/2-1) and session Plan (ISO MPC 3/3-1)</p>	<p><i>Week Number 1:</i> Definition of the magnetic terms, magnetic materials and the B-H curve.</p> <p><i>Week Number 2:</i> Magnetic circuits principles.</p> <p><i>Week Number 3:</i> Electromechanical Energy Conversion Principles.</p> <p><i>Week Number 4:</i> Force and torque equations in magnetic circuits.</p> <p><i>Week Number 5:</i> Construction of a DC machine.</p> <p><i>Week Number 6:</i> EMF and torque equations in dc machines.</p> <p><i>Week Number 7:</i> Armature windings and commutator design.</p> <p><i>Week Number 8:</i> Armature reaction and compensation techniques.</p> <p><i>Week Number 9:</i> Self excitation of dc generators.</p> <p><i>Week Number 10:</i> External characteristics of dc generators.</p> <p><i>Week Number 11:</i> Kinds of losses and efficiency of dc machines.</p> <p><i>Week Number 12:</i> Torque and speed characteristics of dc motors.</p> <p><i>Week Number 13:</i> Speed control of dc motors.</p> <p><i>Week Number 14:</i> Starting of dc motors.</p> <p><i>Week Number 15:</i> DC Motor electrical braking techniques.</p> <p><i>Week Number 16:</i> Final Exam.</p>														
<p>5- Teaching and Learning Methods</p>	<ul style="list-style-type: none"> • Lectures • Tutorials • Reports & sheets • Laboratories 														
<p>6- Teaching and Learning Methods for Students with Special Needs</p>	<ul style="list-style-type: none"> • Lectures • Tutorials • Reports & sheets • Laboratories • Condensed office hours 														
<p>7- Student Assessment:</p>															
<p>a- Procedures used:</p>	<p>Written Examinations to assess the intended learning outcomes Class activities (Reports, Discussions, -----) to assess the intellectual Skills</p>														
<p>b- Schedule:</p>	<table border="0"> <tr> <td>Assessment 1</td> <td>7th Week Written Exam</td> </tr> <tr> <td>Assessment 2</td> <td>12th Week Written Exam</td> </tr> <tr> <td>Assessment 3</td> <td>Continuous Assessments</td> </tr> <tr> <td>Assessment 4</td> <td>16th Week Final Written Exam</td> </tr> </table>	Assessment 1	7th Week Written Exam	Assessment 2	12th Week Written Exam	Assessment 3	Continuous Assessments	Assessment 4	16th Week Final Written Exam						
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<p>c- Weighing of Assessment:</p>	<table border="0"> <tr> <td>7th Week Examination</td> <td>30 %</td> </tr> <tr> <td>12th Week Examination</td> <td>20 %</td> </tr> <tr> <td>Final-term Examination</td> <td>40 %</td> </tr> <tr> <td>Oral Examination</td> <td>0 %</td> </tr> <tr> <td>Practical Examination</td> <td>10 %</td> </tr> <tr> <td>Semester Work</td> <td>0 %</td> </tr> <tr> <td>Total</td> <td>100%</td> </tr> </table>	7th Week Examination	30 %	12th Week Examination	20 %	Final-term Examination	40 %	Oral Examination	0 %	Practical Examination	10 %	Semester Work	0 %	Total	100%
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<p>8- List of References:</p>	<p>C.Hubert, 'Electric Machines" Maxwell Macmillan, 1991</p>														

a- Course Notes	
b- Required Books (Textbooks)	B. S. Guru, "Electric Machinery and Transformers", Oxford Uni. Press, 2001
c- Recommended Books	
d- Periodicals, Web Sites, ..., etc.	

Course Instructor

Name: **Dr. Ahmed Kadry**

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**

Signature: