



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 322	Course Title: Electrical Machines (2)	Academic Year/Level: 3
Specialization: Electrical and Control Eng.	No. of Instructional Units: 3	Lecture 2 Tutorial 2 Lab 2

2- Course Aim	<ul style="list-style-type: none"> • Providing detailed skills related to the subject of single phase transformers and induction motors. • To investigate the different aspects of single phase transformers. • To study the construction and theory of operation for its 3 phase induction motors. • To study the running performance and speed control of the 3 phase induction motors.
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3- Intended Learning Outcome

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>
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	<p>A.31 Formulate the problem, realizing the requirements and identifying the constraints</p> <p>A.32 Know the modern renewable energy systems</p>
b- Intellectual Skills	<p>B.11 Analyze results of numerical models and assess their limitations</p>
c- Professional Skills	<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.11 Exchange knowledge and skills with engineering community and industry</p> <p>C.12 Prepare and present technical reports</p>
d- General Skills	<p>D.5 Lead and motivate individuals</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> Single phase transformer; polarity & connections.</p> <p><i>Week Number 2:</i> No load operation of single phase transformer</p> <p><i>Week Number 3:</i> Per unit system for the single phase transformer.</p> <p><i>Week Number 4:</i> Voltage regulation, losses and efficiency.</p> <p><i>Week Number 5:</i> Auto transformers.</p> <p><i>Week Number 6:</i> Construction of three phase induction motor.</p> <p><i>Week Number 7:</i> 7th week exam + EMF generated per phase.</p> <p><i>Week Number 8:</i> Actual EMF value for the 3 – phase IM.</p> <p><i>Week Number 9:</i> Effect of harmonics in the 3-phase IM.</p> <p><i>Week Number 10:</i> Rotor & synchronous speed for the 3-phase IM.</p> <p><i>Week Number 11:</i> Power flow of the 3-phase induction motor.</p> <p><i>Week Number 12:</i> 12th week + IM equivalent circuit parameters estimation.</p> <p><i>Week Number 13:</i> Torque/speed characteristics for the 3-phase IM.</p> <p><i>Week Number 14:</i> Losses & efficiency in the 3- phase IM.</p> <p><i>Week Number 15:</i> Speed control for the 3- phase IM.</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>Written Examinations to asses The Intended Learning Outcomes</p> <p>Class Activities (Reports, Discussions, -----) to asses The Intellectual Skills</p>										
<p>a- Procedures used:</p>	<p>Written Examinations to asses The Intended Learning Outcomes</p> <p>Class Activities (Reports, Discussions, -----) to asses 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	7 th Week Written Exam	Assessment 2	12 th Week Written Exam	Assessment 3	Continuous Assessments	Assessment 4	16 th Week Final Written Exam		
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<p>c- Weighing of Assessment:</p>	<table border="0"> <tr> <td>7th Week Examination</td> <td>25%+5% practical</td> </tr> <tr> <td>12th Week Examination</td> <td>10%+10% practical</td> </tr> <tr> <td>Final-term Examination</td> <td>40%</td> </tr> <tr> <td>Oral Examination</td> <td>0%</td> </tr> <tr> <td>Semester Work</td> <td>10%</td> </tr> </table>	7 th Week Examination	25%+5% practical	12 th Week Examination	10%+10% practical	Final-term Examination	40%	Oral Examination	0%	Semester Work	10%
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	Total	100%
8- List of References:	C.Hubert, 'Electric Machines" Maxewell Macmillan, 1991	
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: