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:	**Course Title:**	**Academic Year/Level:**
EE 422	Electrical Machines 3	4
Specialization:	**No. of Instructional Units:**	**Lecture** 2
Electrical and Control Eng.	3	**Tutorial/ Practical** 2

2- Course Aim	• To investigate the different aspects of three phase transformers. • To study the generation of A.C. voltage from synchronous generators. • To study the characteristics of synchronous motors and their applications.
3- Intended Learning Outcome	
a- Knowledge and Understanding	A.8 Current engineering technologies as related to disciplines
b- Intellectual Skills	B.2 Select appropriate solutions for engineering problems based on analytical thinking B.11 Analyze results of numerical models and assess their limitations
c- Professional Skills	C.3 Create and/or re-design a process, components or system, and carry out specialized engineering designs C.5 Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results C.6 Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs

	C.18 Test and examine components, equipment and systems of electrical power and machines and control engineering
d- General Skills	D.1 Collaborate effectively within multidisciplinary team D.6 Effectively manage tasks, time, and resource
4- Course Content According to Course Matrix (**Form 11a**), Course File Summary (**ISO MPC 3/2-1** and session Plan (**ISO MPC 3/3-1**)	*Week Number 1:* 3 - phase transformers; polarity and connections *Week Number 2:* Three phase / two phase transformation *Week Number 3:* Harmonics suppression in 3-phase transformers *Week Number 4:* Tap changer, voltage & current transformers *Week Number 5:* Parallel operation of transformers *Week Number 6:* Synchronous generator construction *Week Number 7:* EMF & Equivalent circuit of the alternators *Week Number 8:* Power equation for the synchronous generators *Week Number 9:* Load angle and operation stability limits *Week Number 10:* Voltage regulation in synchronous generators *Week Number 11:* Synchronization between two alternators *Week Number 12:* V - curves of synchronous motors *Week Number 13:* Starting methods of the synchronous motors *Week Number 14:* Saliency effect in synchronous machines *Week Number 15:* Synchronous reluctance motor *Week Number 16:* Final exam
5- Teaching and Learning Methods	- Lectures - Tutorials - Reports & sheets - Laboratories
6- Teaching and Learning Methods for Students with Special Needs	- Lectures - Tutorials - Reports & sheets - Laboratories - Condensed office hours
7- Student Assessment:	Written Examinations to asses The Intended Learning Outcomes Class Activities (Reports, Discussions, ------) to asses The Intellectual Skills
a- Procedures used:	Written Examinations to asses The Intended Learning Outcomes Class Activities (Reports, Discussions, ------) to asses The Intellectual Skills
b- Schedule:	Assessment 1 — 7th Week Written Exam Assessment 2 — 12th Week Written Exam Assessment 3 — Continuous Assessments Assessment 4 — 16th Week Final Written Exam

c- Weighing of Assessment:	7^{th} Week Examination	30%
	12^{th} Week Examination	15%+5% Practical
	Final-term Examination	40%
	Oral Examination	0%
	Practical Examination	0%
	Semester Work	10%
	Total	100%
8- List of References:	C. Hubert, 'Electric Machines" Maxewell Macmillan, 1991	
a- Course Notes		
b- Required Books (Textbooks)	P.C. Sen, "Principles of Electrical Machines and Power Electronics", John Wiley, 1989	
c- Recommended Books		
d- Periodicals, Web Sites, ..., etc.		

Course Instructor

Name: **Dr. Ahmed El Shenawy**

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: