Course Description Form

1. Course Name:
Electrical Machines
2. Course Code:
ELMA215
3. Semester / Year:
3 / 2024-2025
4. Description Preparation Date:
01/06/2024
5. Available Attendance Forms:
Theoretical lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
٤٥ / 4
7. Course administrator's name (mention all, if more than one name)
Dr. Farazdaq R. Yaseen , L. Baydaa Hashim
8. Course Objectives

Course Objectives	• To understand basic concepts of transformers. • To understand basic concepts of DC machines. • To understand basic concepts of AC machines. • To control the DC Motor: starting, running, and braking. • To control the AC Motor: starting, running, and braking.
9. Teaching and Learning Strategies	
Strategy	• The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	٦	Learn about magnetic circuits and DC generators	**Magnetic Circuits, DC Generator: construction, operation, types, equivalent circuits, build up voltage**	**Theoretical lecture and model viewing**	**Theoretical exam**

3-4	٦	Calculating generator efficiency and identifying DC motors	**DC Generator: Power flow diagram, efficiency, losses, DC Motors: construction, operation, types, equivalent circuits, power developed**	**Theoretical lecture and exercises Theoretical lecture and introductory video**	**Theoretical exam**
5-6	٦	Study of the commutation, losses, operation and braking of the engine	**DC Motor: armature reaction, commutation, losses, power stages, DC Motors: starting, running, braking, and speed control method**	**Theoretical lecture**	**Theoretical exam**
7-8	٦	Methods of controlling speed	**DC Motors: closed loop speed control, Transformers**	**Theoretical lecture and introductory video**	**Theoretical exam**
9-12	١٢	Learn about induction motors	**Three phase induction motors: construction, operation, types, slip, equivalent circuits, Three phase induction motors: losses, power stages, Three phase induction motors: starting, speed control methods, Three phase synchronous generators**	**Theoretical lecture and introductory video**	**Theoretical exam**
13-15	٦	Learn about different types of engines	**Three phase synchronous motors, Single phase induction motors, Special Machines: two phase servo motors, stepper motors**	**Theoretical lecture and introductory video**	**Theoretical exam**

11. Course Evaluation

20% documented exam
١٠% Quizes
١٠% reports and homework

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	P. C. Sen, " Principles of Electrical Machines and Power Electronics" ,John and Wiley Sons. Inc., Second Edition, USA 2014
Main references (sources)	P. C. Sen, " Principles of Electrical Machines and Power Electronics" ,John and Wiley Sons. Inc., Second Edition, USA 201
Recommended books and references (scientific journals, reports…)	B.L. Theraja, A.K. Theraja, " Electrical Technology" S. Chand and Company LTD, 2005 India
Electronic References, Websites	https://pdfcoffee.com/solutions-principles-of-electric-machines-and-power-electronics-third-edition-pdf-free.html