EE354-3: Electrical Machine (3)

Course code and name	EE354-3: Electrical Machine (3)
Credits units	3 Credit units
Contact hours	5 Contact hours: 2 lecture, 1 tutorial and 2 practical
Instructor name	Dr. Ahmed Said Mohamed Oshaba
Textbook	- Stephen J. Chapman. Electric Machinery Fundamentals, fourth edition, McGraw-Hill, 2005, ISBN0-07-246523-9 - Fitzgeraid, A. E., Kingsley, C. and Kusko, A. "Electric Machinery" Third Edition, (Book) McGraw-Hill, Inc, N. Y. 1971.
Other supplemental materials	- Dynamics Electrical Machine and Special Machine Notebook. - Assembly Language software (C Language software)
	Specific course information
a. Course description	This course includes, basic principles for electric machine analysis, magnetically coupled circuits, obtaining the matrix equation for transformer principle operation tests, basic principles of rotating machine, dynamics analysis of different types for DC-machine, dynamics analysis for induction and synchronous machines. Models and performance characteristics for dynamics operations, their performance and application, analysis of different types for special machine (single phase induction motors, permanent magnet machine, control motors, and stepper motor), and experimental tests for all topics.
b. Prerequisite	EE352-3
c. Required / Elective	Required
	Course Learning Outcomes
<u>CLO of the Lecture Activities:</u> CLO1: Describe the mathematical relationships between the different variables of the electrical and magnetic circuits and Describe the difference between the different types of losses in the magnetic circuits. CLO2: Explain the equivalent circuit of the single and three phase transformer from the	

engineering aspects and Explain the matrix equation of the single and three phase transformers.

CLO3: Illustrated the rotating machine concepts and Illustrated the different types of direct current (DC) machines.

CLO4: Analyze the equivalent circuit of three phase induction motor and Analyze the dynamic operation of induction motor and synchronous machine.

CLO5: Evaluate of performance the different types of special machine (single phase induction motors, permanent magnet machine, control motors, and stepper motor).

CLO of the Laboratory Activities:

CLO1: Verify theory and to improve knowledge learned in class.

CLO2: Formulate and solve problems related to theory.

CLO3: Design and safety conducts an experimental procedure.

CLO4: Independently perform accurate quantitative measurements, interpret experimental results, perform calculations on these results and draw a reasonable, accurate conclusion.

CLO5: Communicate critical analysis of scientific information through written reports.

CLO6: Be integrated inside a group of work and respect the team working.

Brief list of topics to be covered

- Magnetic circuits, Transformers and basic principles for electrical machine

- Dynamic analysis of DC Machines

- Dynamic analysis of Induction Machines and dynamic analysis of Synchronous Machines

- Basic principles for special electrical machine , stepper Machines

- Single phase induction motors, Permanent magnet machine and control motors

Mapping Course Learning Outcomes to Student Outcomes

	Lecture Activities						
	SO1	SO2	SO3	SO4	SO5	SO6	SO7
CLO1							
CLO2							
CLO3							
CLO4							

CLO5							

	Laboratory Activities						
	SO1	SO2	SO3	SO4	SO5	SO6	SO7
CLO1							
CLO2							
CLO3							
CLO4							
CLO5							
CLO6							