University of Tehran
School of Electrical and Computer Engineering

Course:	**8101322 – Electrical Machines 2**
Course type:	EE*: Com ☐ / E ☐ / P ☐ / B ☐ / Con ☐ / D ☐ — CE*: SW ☐ / HW ☐ / IT ☐ — Credit: 3 — Required: ☒ — Elective: ☐
Level:	Undergraduate ■ Graduate ☐
Co-requisite(s):	None.
Prerequisite(s):	Electrical Machines 1 (8101425)
Prerequisite by topic:	
Textbook(s):	[1] S. J. Chapman, Electric Machinery Fundamentals, WCB/McGraw-Hill, 3rd Edition, 1998. [2] G. R. Slemon, and A. Straughen, Electric Machines, Addison_wesley, 1990. [3] G. McPherson, an Introduction to Electrical Machines and transformers, McGraw-Hill, 5th Edition, 1990. [4] P. S. Bimbhara, Electrical Machinery, Khanna Publishers, Delhi, 6th Edition, 1998.
Coordinator:	Davarpanah, Professor, School of ECE
Goals:	The course adopted is to give a careful explanation of two main electromagnetic devices in their basic forms, viz, the transformer and three-phase induction machine. A sound knowledge of these machines will permit the ready understanding of many other machines, which for the most part are modifications of one or other type. The course covers the needs of those whose training requires a deep understanding of all aspects of machine behavior, as studies of power systems, control systems, machine design and general industrial applications.
Outcome:	Upon successful completion of the course, students will be able 1. To understand the principles of operation of transformers and induction machines. 2. To investigate the operation of ac machines in general. 3. To be familiar with applications of different types of transformers in various environments. 4. To predict the performance of transformers and induction motors in different situation and combinations. 5. To control the speed of three-phase induction motors.
Topics:	1) Single-phase and three-phase transformers 2) Complementary topics on transformers

	3) Fundamentals of ac machines 4) Three-phase induction machines 5) Complementary topics on induction motors.
Computer usage:	Developing computer programs for modeling of transformers.
Assignments:	20 to 30 homework assignments
Projects:	Only interesting students can take project. The projects will be on modeling of different aspects of transformers operation.
Grading:	Assignments: 5% Quiz: 10% Midterm exams: 20% Final exam: 65%
Further readings:	[1] A. E. Fitzgerald, et. al., Electric Machinery, 5th Edition, McGraw-Gill, 1990. [2] J. Hindmarsh, Electrical Machines and their Applications, Pergamon Press Ltd, 1980.
Prepared by:	Professor Jawad Faiz
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*EE: Electrical Engineering		CE: Computer Engineering	
Com	Communications	SW	Software
E	Electronics	HW	Hardware
P	Power	IT	Information Technology
B	Bioelectronics		
Con	Control		
D	Digital System		