EE 424 – Electrical Drives (1)

CREDIT HOURS
3 Hours

CONTACT HOURS (Hours/week)
Lecture: 2; Tutorial: 2

COURSE COORDINATOR
Dr Hady El Helw

TEXT BOOK:
M. El-Sharkawi, "Fundamentals of Electric Drive", Brooks/Cole USA

COURSE DESCRIPTION:
DC Drives. Single phase separately excited dc motors drives. Three phase drive. Dual converter. Reversible drives. Armature current reversal. Field current reversal. Closed-loap control. Chopper drives. Principles of: power control, regenerative brake control rheostat brake control, two/four quadrant chopper drives and multiphase choppers. AC drives; Induction motor drive. Stator voltage and frequency control. Current control. Voltage, current and frequency control. Closed-loop control; synchronous motor drive with closed-loop control.

PREREQUISITE:
EE 421

RELATION OF COURSE TO PROGRAM:
Required

COURSE INSTRUCTION OUTCOMES:
The student gains detailed skills related to the subject of DC and AC electrical drives.

TOPICS COVERED:

- Single phase DC motor drives (separately excited and self excited)
- Semi converter and full converter Dc drives.
- Dual converters.
- Reversible drives.
- Three-phase drives.
- Closed loop control of DC drives.
- DC chopper drives for DC Motors and its discontinuous operation.
- Induction motor drives, operation & performance

- Voltage and frequency control, current control and closed loop control of the 3 - phase induction motor drives.
- Synchronous motor drive

CONTRIBUTION OF COURSE TO MEET THE REQUIREMSNTS OF CRITERION 5:

Professional Component Content			
Math and Basic Sciences	**Engineering Topics**	**General Education**	**Engineering Design**
	✓		✓

RELATIONSHIP OF COURSE TO STUDENT OUTCOMES:

Student Outcomes		Course Outcomes
a.	An ability to apply knowledge of mathematics, science, and engineering.	
b.	An ability to design and conduct experiments, analyze and interpret data.	✓
c.	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.	
d.	An ability to function on multi-disciplinary teams.	
e.	An ability to identify, formulate, and solve engineering problems.	
f.	An understanding of professional and ethical responsibility.	
g.	An ability to communicate effectively.	
h.	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal content	
i.	A recognition of the need for, and an ability to engage in life-long learning.	
j.	A knowledge of contemporary issues within and outside the electrical engineering profession.	
k.	An ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.	✓