

EE 423 – Power Electronics (2)

CREDIT HOURS

3 Hours

CONTACT HOURS (Hours/week)

Lecture: 2; Tutorial: 2; Lab: 2

COURSE COORDINATOR

Dr Hady El Helw

TEXT BOOK:

M. H. Rashid, "Power Electronics: Circuits, Devices and Applications", Prentice Hall

COURSE DESCRIPTION:

MOSFET power transistor. Chopper principles and classification. Buck and Boost regulator(s), Cuk regulator. Single phase AC voltage controllers principles. Three-phase full wave AC voltage controllers. Cycloconverters. Principles and performance of PWM inverters. Three phase inverters, other kinds of inverters, and applications

PREREQUISITE:

EE 421

RELATION OF COURSE TO PROGRAM:

Required

COURSE INSTRUCTION OUTCOMES:

The student gains detailed skills related to subject of D.C choppers, AC voltage controllers and DC-AC inverters.

TOPICS COVERED:

- Providing detailed skills related to subject of D.C choppers DC-AC inverters.
- Chopper principles and classification (the buck and the boost regulator, the buck and the cuk regulator)
- AC voltage controllers principles and classifications (single phase full wave AC voltage controllers, three phase full wave AC voltage controllers)
- Cycloconverters
- Principles and performance of PWM inverters, three phase inverters, other kinds of inverters.
- Applications

CONTRIBUTION OF COURSE TO MEET THE REQUIREMENTS 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.	