



The Hashemite University
Faculty of Engineering
Course Syllabus

Course Title: Motor Drive Systems **Course Number:** 110405422
Department: Mechatronics Engineering **Designation:** Compulsory
Prerequisite(s): 110406329 + 110405323
Instructor: Dr. Mohammad Salah **Instructor's Office:** E3130
Instructor's e-mail: msalah@hu.edu.jo, www.msalah.com

Office Hours: All the time via MS Teams or Facebook messenger (Dr-Mohammad Salah)

Time: 12:00 – 1:00 (Su / Tu / Thu) **Class Room:** E2024

Course description: This course will provide students with the basic principles of power electronic devices and switches, in addition to operation, drive, and control of electric motors using classical (relays and contactors) and modern (power electronics) methods, motor behavior when operated from variable power sources (converters), DC motor drives using phase-control and choppers, AC motor drives for induction motors using phase and frequency (inverters).

Textbook(s):

- Stephen Chapman: "Electric Machinery Fundamentals", 5th edition, McGraw Hill, 2012.
- M. Rashid, "Power Electronics: Circuits, Devices, and Applications," Prentice Hall Inc., Third Ed., 2003.

Other required material:

- N. Mohan *et al.*, "Power Electronics: Converters, Applications, and Design," John Wiley & Sons, Inc., Third Ed., 2002.
- T. Wildi, "Electrical Machines, Drives, and Power Electronics," Prentice Hall, 6th Ed., 2006.
- D. Polka, "Motors and Drives: A Practical Technology Guide," ISA, 2003.
- R. Krishnan, "Electric Motor Drives: Modeling, Analysis, and Control," Prentice Hall Inc., 2001.

Course objectives: *The student shall be able to:*

1. Obtain mathematical models as well as estimate and analyze the performance characteristics of motor drive systems
2. Design industrial and modern drive systems to operate and control motor speed using an appropriate strategy according to the application
3. Comprehend the impact of state-of-the-art electric machines in solving industrial problems

Topics covered:

1. Basic concepts of drive and control systems
2. Safety and control elements in control panels
3. Three-phase induction motor starting methods
4. Operation of single phase motors
5. Motor braking methods
6. Introduction to electric drives and power electronic devices
7. DC motor drives
8. AC motor drives

Class/laboratory schedule: 3 class sessions each week; 50 min each

Grading Plan:

Midterm Exam	(50 Points)	Sun 15/11/2020 (12:00 – 1:00)
Final Exam	(50 Points)	To be announced by the registrar

General Notes: Attendance is mandatory and absence is allowed up to 7 lectures

Prepared by: Dr. Mohammad Salah **Date:** 11/10/2020