



The Hashemite University
Faculty of Engineering
Course Syllabus

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|-----------------------------------|--|-----------------------------|--------------------------------|
| Course Title: | Electrical Machines and Drive Laboratory | Course Number: | 110405423 |
| Department: | Department of Mechatronics | Designation: | Compulsory |
| Prerequisite(s): | 110405422 | | |
| Instructor: | Dr. Mohammad Salah Eng. Enas Hussain | Instructor's Office: | E3130 E1043 |
| Instructor's e-mail: | msalah@hu.edu.jo , www.msalah.com | | |
| Office Hours: | Announced on the office door | | |
| Time: | 2:00 – 4:00 (Sun) 2:00 – 4:00 (Mon) | Class Room: | E1043 |
| Course description: | This course introduces experiments on single and three-phase transformers, autotransformers, separately excited, shunt, series, and compound DC motors, three-phase induction motors, DC and AC generators, speed control and drive systems (convertors and invertors). | | |
| Textbook(s): | Stephen Chapman: "Electric Machinery Fundamentals", 5th edition, McGraw Hill, 2012. | | |
| Other required material: | <ol style="list-style-type: none">1. Smarajit Ghosh, "Electric Machines," Pearson Education: Delhi, 2005.2. Sayed Naser, "Handbook of Electrical Machines," McGraw-Hill: New York, 1987.3. Sayed Naser, "Electrical Machines and Electromechanics," Schaum's outline series , 2nd Ed, 1998. | | |
| Course objectives: | <i>The student shall be able to:</i> <ol style="list-style-type: none">1. Evaluate and analyze the performance characteristics of transformers and electric motors (DC and AC)2. Apply various methods of operation, control, and drive for DC and AC motors. | | |
| Topics covered: | <ol style="list-style-type: none">1. Basic Measurements2. Transformers3. Shunt DC Motor4. Series DC Motor5. Three Phase Induction Motor6. Operational Methods of Three-Phase Induction Motor7. AC Drive Systems8. DC Drive Systems9. Demonstration for Single-Phase, Universal, and Brushless Motors | | |
| Class/laboratory schedule: | 1 lab session each week; 120 minutes | | |
| Grading Plan: | Lab Work | (30 Points) | To be examined after the lab |
| | Midterm Exam (Practical) | (15 Points) | Sun/Mon 3-4/3/2019 at lab time |
| | Midterm Exam (Theory) | (15 Points) | Sun/Mon 3-4/3/2019 at lab time |
| | Final Exam (Practical) | (20 Points) | Sun/Mon 7-8/4/2019 at lab time |
| | Final Exam (Theory) | (20 Points) | Sun 14/4/2019 TBD |
| General Notes: | Attendance is mandatory and absence is allowed up to total 2 labs | | |
| Prepared by: | Dr. Mohammad Salah | Date: | 13/1/2019 |

Laboratory Schedule

| Section 1: Sunday | Section 2: Monday | Experiment |
|--------------------------|--------------------------|-------------------------------------|
| 20/1/2019 | 21/1/2019 | EX 1 + Lab Sheet 1 |
| 27/1/2019 | 28/1/2019 | EX 2 + Lab Sheet 2 |
| 3/2/2019 | 4/2/2019 | EX 3 + Lab Sheet 3 |
| 10/2/2019 | 11/2/2019 | EX 4 + Lab Sheet 4 |
| 17/2/2019 | 18/2/2019 | EX 5 + Lab Sheet 5 |
| 24/2/2019 | 25/2/2019 | Free Lab |
| 3-4/3/2014 | | Midterm Exam (Practical and Theory) |
| 10/3/2019 | 11/3/2019 | EX 6 + Lab Sheet 6 |
| 17/3/2019 | 18/3/2019 | EX 7 + Lab Sheet 7 |
| 24/3/2019 | 25/3/2019 | EX 8 + Lab Sheet 8 |
| 31/3/2019 | 1/4/2019 | Demonstrations for Other Motors |
| 7/4/2019 | 8/4/2019 | Final Practical Exam |
| 14/4/2019 | | Final Theory Exam |

Note:

How to troubleshoot three-phase induction motors are included in the final exam (Theory Part)