

ENGG 3510

Electromechanical Devices

Instructor: Dr. Mohammad Biglarbegian

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Office Hours: Thursdays: 12:30 pm-2 pm

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Class Hours: Monday/Wednesday/Friday, MACK room 115

Tutorials: Mondays 9:30 am-10:20 am, and 10:30 am-11:20 am, MACK Room 315

Midterm Exam: Friday October 21, Rozanski 103, 11:30 am-12:30 pm

Final Exam: 2:30pm - 4:30pm, (2011/12/16), Room TBA

Outlines: Electromechanical systems are used everywhere ranging from basic home devices to advanced machines used in industry. As a mechanical engineer, one should have a general understanding on these devices. The course covers magnetic material, permanent magnets, magnetic circuits and related topics such as EMF, MMF, inductance, etc. It also covers, transformers, electric machines (motors and generators) both DC and AC, special motors such as stepper, servo, as well as speed control of motors. You will learn how the fundamental laws of magnetism are used in electromechanical systems such as transformers, electromotors, or generators. By the end of the term, you should have a good understanding of such devices. This course covers the following topics:

1. Background on Magnetism
2. Magnetic circuits and applications
3. Transformers
4. Linear Machines
5. DC machines (generators and motors)
6. AC machines (generators and motors)

7. Special purpose machines
8. Introduction to speed control of motors

The breakdown of the marking scheme is:

1. Midterm 25%
2. Assignments 15%
3. Project and presentation 15%
4. Final 45%

Midterm and final exams have two separate parts:

- Part A: Questions (**closed-books and closed-notes**) you are given 15-30 minutes to complete this section.
- Part B: Problems: you are allowed to bring your own **only one-page** aid sheet in which can have **only** formulas and **NOT** solved problems.

References:

The textbook for the course is available at the bookstore and is selected chapters from the following sources:

1. "Principles and Applications of Electrical Engineering", by G. Rizzoni, McGraw-Hill, 5th edition, 2007 (we only cover chapters 18-20)
2. "Electric Machinery Fundamental", by S. J. Chapman, McGraw-Hill, 5th edition, 2011 (we only cover chapters 8-10)

* Purchase of the textbook is encouraged but not mandatory. Lectures notes will also be provided.

University Policy on Academic Misconduct:

Academic misconduct, such as plagiarism, is a serious offence at the University of Guelph. Please consult the Undergraduate Calendar 2011-2012 and School of Engineering programs guide, for offences, penalties and procedures relating to academic misconduct.

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Disclaimer:

The instructor reserves the right to change any or all of the above in the event of appropriate circumstances, subject to the University of Guelph Academic Regulations.