

ENGG 3510

Electromechanical Devices

Instructor: Dr. Mohammad Biglarbegian
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Office Hours: Thursdays: 12:30 pm-2 pm

TAs: Tim Lambert (full TA)
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Class Hours: Monday/Wednesday/Friday, 9:30 am-10:20 am: MACK, Room 029

Labs: Tues 11:30am - 1:20PM, 1:30pm-3:20pm, Thurs. 11:30am - 01:20pm THRN 1007

Tutorials: Wed 1:30pm-2:20pm MACK 311, Wed 4:30pm - 5:20pm, MACK 304, Thurs.
4:00pm - 4:50pm, MACK 237

Midterm Exam: Wednesday October 24, MACHALL 149, 7 pm-9 pm

Final Exam: 07/12/2012 (Friday), 2:30pm - 4:30pm, 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. Labs 20%
4. Final 40%

Both midterm and final exams have questions and problems. Questions are related to the fundamental understanding of the concepts taught in class. For both exams you are allowed to bring your own **only one-page** aid sheet (double-side) which can **only** have formulas (**No** solved problems, no description, no explanation, no figures, no diagrams, no graphs, no curves, no tables, etc.). **Any deviations** from this will result in automatic deduction of 35%.

Important Note:

while you are encouraged to discuss with other classmates problems in the assignment or labs, there is zero tolerance for plagiarism or copying. A grade of 0 will be assigned to any assignment or lab report if they are copied or plagiarism is done by any means.

Assignments:

Late policies for the assignments only:

- 50% deduction if the assignment is submitted late within 12 hours of the deadline
- assignments are not accepted beyond that (i.e. grade of 0)

Labs:

There are four labs throughout the term which you are supposed to complete with a group of 5-6 people. Lab reports are due in the lab sessions and the TAs will go over the deadlines as they occur. Reports are usually due the week the next lab starts (i.e. the lab 1 report is due the week the lab 2 starts).

Late policies for the lab reports only:

- 35% deduction if the report is submitted late within 24 hours of the deadline (i.e. within 1 day)
- 70% deduction if the report is submitted late within 48 hours of the deadline (i.e. within 2 days)
- reports are not accepted beyond that (i.e. grade of 0)

Note: Grouping for the labs is also done in the lab. For remarking the labs and assignments, please discuss with the TAs in the lab.

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 **optional**.

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.