ENGINEERING 6843: Rotating machines

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Communication I can be contacted by email or during my office hours as listed above.

CALENDAR ENTRY:

6843 Rotating Machines examines the fundamentals of rotating machines; design of machine windings; poly phase and single phase induction motor theory and applications; synchronous machine theory; stability and control of synchronous generators; control and protection of rotating machines, an introduction to A.C. motor drives, and machines.

PREREQUISITES: ENGI 4841
SCHEDULE:
https://www.mun.ca/engineering/undergrad/2017-2018/Fall2017T6Schedule.pdf
CREDIT VALUE: 3 credits
ACCREDITATION UNITS: 45 Combined Educational Hours; Focus: 100% Engineering Science
RESOURCES:
Course Texts:

1. Electrical Machines with Matlab, T. Gonen, Second Edition, CRC Press, 2012
2. Laboratory Manual for Engineering 6843 (MUN Bookstore)

Matlab: **Students are encouraged to use MATLAB It is available in the Faculty.**

Additional Reference: online.mun.ca

MAJOR TOPICS:

	Topic	
1.	Review & Rotating Machine Concepts	Assignment 1; Test 1
2.	Three Phase Induction Motor	Assignment 2; Test 1
3.	Synchronous Generator	Assignment 3; Test 2
4.	Synchronous Motor	Problem Set
5.	Single Phase Induction Motors	

LABORATORIES

- Attendance is mandatory for successful completion of the course work.
- Laboratory report is required for three experiments. Report (for Expt. 2, 3 and 4) is due one week from the date of performing the appropriate experiment. Submit one report per group.

Laboratory Schedule (September 2017 – November 2017) *EN1021C*

Expt.	Title of Experiment	Date
	MATLAB	Sept. 20 **2-4 p.m EN 1038B**
1.	Rotating Magnetic Field	Sept. 27
2.	Three phase Induction Motor (Report is required)	Oct. 4
3.	Synchronous Generator (may be a long Lab. 2 sessions Report is required)	Oct. 25 & Nov.1
4.	Synchronous Motor (Report is required)	Nov. 22
5.	Voltage Control Using Synchronous Motor	Nov. 29

Note: There may be a minor change in Lab. schedule, depending on the topics covered in the lectures.

Important: Students are expected to attend all scheduled lecture, tutorial and Laboratory sessions.

LEARNING OUTCOMES:

Upon successful completion of this course, the student will be able to:

	LEARNING OUTCOMES	GRADUATE ATTRIBUTES. LEVEL OF COMPETENCE	Methods of Assessment
1	Calculate voltage, current and power in three phase circuits.	1.3, 2.3	Assignments, Tests, Final Exam.
2	Describe the creation of rotating magnetic fields.	1.3	Assignments, Tests, Final Exam.
3	Describe the construction and operating principles of 3 phase induction motor.	1.3	Assignments, Tests, Final Exam.
4	Analyze a 3 phase synchronous generator and evaluate its performance.	1.3, 2.3	Labs, Assignments, Tests, Final Exam.
5	Formulate a two-axis model of a synchronous generator.	1.3, 2.3	Labs, Assignments, Tests, Final Exam.
6	Analyze synchronous motors and apply it to improve the performance of a power system.	1.3, 2.3	Labs, Assignments, Tests, Final Exam.
7	Apply the basic principles of operation, and characteristics, of single phase motors.	1.3, 2.3	Labs, Assignments, Tests, Final Exam.
8	Effectively communicate technical information in laboratory reports.	7.2	Labs, Assignments, Tests, Final Exam.

See www.mun.ca/engineering/undergrad/graduateattributes.pdf for more information on the 12 Graduate Attributes you are expected to be proficient in upon graduation.

Each Graduate Attribute for each learning outcome is rated at a level of proficiency between 1 and 3 (1=introductory, 2=intermediate, 3=sophisticated).

ASSESSMENT:

Assignments /Labs.	10% (3 Assignments; 3 Lab. Reports) Tentative dates: Assignments: Sep. 30, Oct. 17, Nov. 7, 2017 Tentative Dates: Labs., 1 week after Lab.	
Test 1	20%	Wed. October 18, 2017, 2- 3:15 p.m. EN1003
Test 2	20%	Wed. November 8, 2017, 2-3:15 p.m. EN1003
Final exam.	50%	

Lab. report Submission Schedule: One week after completing the Lab.
Calculator Policy: Programmable Calculators are not allowed.

ACADEMIC INTEGRITY AND PROFESSIONAL CONDUCT:

Students are expected to conduct themselves in all aspects of the course at the highest level of academic integrity. Any student found to commit academic misconduct will be dealt with according to the Faculty and University practices. More information is available at www.engr.mun.ca/undergrad/academicintegrity.

Students are encouraged to consult the Faculty of Engineering and Applied Science Student Code of Conduct at http://www.engr.mun.ca/policies/codeofconduct.php and Memorial University's Code of Student Conduct at http://www.mun.ca/student/conduct.

LAB SAFETY:

Students are expected to demonstrate awareness of, and personal accountability for, safe laboratory conduct. Appropriate personal protective equipment (PPE) must be worn (e.g. steel-toed shoes, safety glasses, etc.) and safe work practices must be followed as indicated for individual laboratories, materials and equipment. Students will immediately report any concerns regarding safety to the teaching assistant, staff technologist, and professor.

INCLUSION AND EQUITY:

Students who require physical or academic accommodations are encouraged to speak privately to the instructor so that appropriate arrangements can be made to ensure your full participation in the course. All conversations will remain confidential.

The university experience is enriched by the diversity of viewpoints, values, and backgrounds that each class participant possesses. In order for this course to encourage as much insightful and comprehensive discussion among class participants as possible, there is an expectation that dialogue will be collegial and respectful across disciplinary, cultural, and personal boundaries.

STUDENT ASSISTANCE: Student Affairs and Services offers help and support in a variety of areas, both academic and personal. More information can be found at www.mun.ca/student.