

Winter 2023

ECE 7030 – ADVANCED ELECTRIC MACHINES AND DRIVES

COURSE DESCRIPTION:

The course deals with modeling of electric machines and electric drive systems. Transient and steady state models of ac and dc electric machines will be developed and strategies for their drive (based on both steady state and transient observations) will be developed. The course has intensive analytical and computer simulation contents.

COURSE OBJECTIVE:

AC and dc machine fundamentals; principles of energy conversion, generalized reference frame theory of electric machines; modeling and simulation of electric machines and drives.

PRE-REQUISITES: Undergraduate level electric machines knowledge.

CONTACT HOURS: 3 hours per week

COURSE CONTENT:

1. Magnetically coupled circuits
2. Energy conversion principles
3. Machine windings, mmf waveforms and inductances
4. DC machine dynamics and drives
5. Induction machine dynamics and drives
6. Synchronous machine dynamics and drives
7. Power electronic circuits for machine drives (overview)

HOMEWORK:

See the evaluation section.

TEXTBOOK:

S. Filizadeh, Electric Machines and Drives: Principles, Control, Modeling, and Simulation, CRC Press, 2013.

EVALUATION:

Your final course grade is determined by your performance in the components listed below in the Evaluation Table.

COMPONENT	NO	VALUE %	TOTAL VALUE	DETAILS / ADDITIONAL INFO
Assignments	TBD		40	
Term test	1		30	
Final examination	1		30	
Total			100	

INSTRUCTOR INFO:

Name:..... Prof. S. Filizadeh
Office:..... SPC-309
Tel:..... (204) 480-1401
Email:..... Shaahin.Filizadeh@umanitoba.ca
Office Hours: By appointment

VOLUNTARY WITHDRAW:

Consult the University Calendar.

REQUIREMENTS/REGULATIONS

Student Responsibilities: It is the responsibility of each student to contact the instructor if he/she is uncertain about his/her standing in the course and his/her potential for receiving a failing grade. Students should also familiarize themselves with Sections 4 and 6 of the Regulations dealing with, among others, incomplete term work, deferred examinations, attendance and withdrawal, etc..

Lectures: Attendance at lectures is essential for successful completion of this course. Students must satisfy each evaluation component in the course.

ACADEMIC INTEGRITY

Students are expected to conduct themselves in accordance with the highest ethical standards of the Profession of Engineering and evince academic integrity in all their pursuits and activities at the university. As such, in accordance with the General Academic Regulations and Requirements of the University of Manitoba, Section 7.1, students are reminded that plagiarism* or any other form of cheating is subject to serious academic penalty (e.g. suspension or expulsion from the faculty or university) regardless of media

- examinations
- assignments
- laboratory reports
- term exams

A student found guilty of contributing to cheating in examinations or term assignments is also subject to serious academic penalty

Please refer any questions regarding Academic Integrity to your course instructor.

***Plagiarism:** to steal and pass off (the ideas or words of another) as one's own; use (another's production) without crediting the source