

TERM YEAR

ECE 7070 – Power System Analysis Winter 2022

COURSE DESCRIPTION:

The topics covered in the course include, introduction to power system operation; power flow analysis; review of transient stability modeling and simulation using the classical model; introduction of detailed machine models for transient stability analysis, modeling of exciters, governors and FACTS devices for transient stability analysis; methods of transient stability analysis; voltage stability.

COURSE OBJECTIVE:

The main objective of this course is to get an in depth understanding of how to model and simulate a power system for assessing its stability. At the end of this course, the students will have a solid understanding gained through hands-on experience of writing computer simulations.

PRE-REQUISITES:

Undergraduate background in Power Systems and Electrical Machines. Students also need a computer programming experience with Matlab or similar platform.

CONTACT HOURS:

3-hours per week

COURSE CONTENT:

The following topics will be covered:

1. Network modeling and power flow analysis.
2. Synchronous machine models and transient stability simulation.
3. Load modeling (including induction machine).
4. Power flow control, HVDC and FACTS.
5. Dynamic models of FACTS devices.
6. Wind and Solar power plant models.
7. Voltage stability.
8. Introduction to the Design of Power System Stabilizers.

HOMEWORK:

There will be assignments and projects.

TEXTBOOK:

Power System Stability and Control, Prabha Kundur, McGraw Hill, 1994.

GRADE ANNOUNCEMENTS:

Grades for this course will be announced by 31st May 2022

EVALUATION:

Your final course grade is determined by your performance in the components list below in the Evaluation Table (seminar, assignments, project, mid-term, and a final examination. **Students must receive a minimum of 50% on the final examination and must complete and pass all components in the course in order to be eligible to receive a passing grade.**

Each component is weighted as follows:

COMPONENT	NO	VALUE %	TOTAL VALUE	DETAILS / ADDITIONAL INFO
Assignments	5	4%	20	
Projects	2	20%	40	
Final Examination	1	40%	40	
TOTAL			100	

GRADE SCALE:

LETTER	MARK	LETTER	MARK	LETTER	MARK	LETTER	MARK
A+	95-100	B+	80-84	C+	65-69	D	45-54
A	85-94	B	70-79	C	55-64	F	<45

INSTRUCTOR INFO:

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Office Hours:..... By appointment

VOLUNTARY WITHDRAW:

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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