University of Manitoba | Price Faculty of Engineering
Department of Electrical and Computer Engineering

Course Outline

Instructor

- Joe LoVetri, P.Eng.
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Office Hours

- After lectures and by appointment

Teaching Assistant

- Saman Dehghan
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- Zahra Nasresfahani
  nasresfz@myumanitoba.ca

Contact Hours

- 4 credit hours
- Lectures: 3 hours per week
- Tutorial: 1.5 hours x 12 weeks
- Laboratories: 3 hours x 5 weeks

Prerequisites:

- ENG 1450 Introduction to Electrical and Computer Engineering

Pre/Corequisite

- MATH 2132 Engineering Mathematical Analysis 2

Important Dates

- **Voluntary Withdrawal Deadline**
  March 19th, 2026
- **Louis Riel Day**
  February 16th, 2026
  No classes or examinations
- **Spring Break**
  February 17th – 20th, 2026
  No classes or examinations
- **Good Friday**
  April 3rd, 2026
  No classes or examinations

ECE 2262 – Electric Circuits

Winter 2026

Course Objectives

The application of circuit concepts; network theorems and formal methods, steady state analysis, frequency and transient response, application of the Laplace transform in the analysis of linear time-invariant networks, and circuits using operational amplifiers.

Course Content

The following topics will be covered:

- Circuit analysis techniques, network theorems and formal methods.
- Introduction to the operational amplifiers.
- Storage energy elements, transient behaviour.
- First and second order circuits' transient response.
- Sinusoidal steady state analysis and steady state response.
- Steady state analysis using phasors.
- Maximum power transfer and the ideal transformer.
- Frequency response: introduction to filters.
- Application of the Laplace transform in the analysis of linear time-invariant networks.

Textbook:

None. Online resources will be supplied.

Learning Outcomes

1. Comprehend and apply general circuit-analysis theorems and techniques.
2. Analyze circuits with energy storage elements, ideal op amps, and ideal transformers.
3. Determine first- and second-order transient response of circuits.
4. Analyze circuits in the sinusoidal steady state, perform steady-state power analysis, and calculate maximum power transfer.
5. Determine and analyze frequency response of RLC circuits.

Expected Competency Levels

Outcome	KB	PA	IN	DE	ET	IT	CS	PR	IE	EE	EP	LL
1	D	D	D		D		I					I
2	D	D	D		D		I					I
3	D	D	D		I		I					I
4	D	D	D		D		I					I
5	D	D	D		I		I					I

Traditional Territories Acknowledgement

The University of Manitoba campuses and research spaces are located on original lands of Anishinaabeg, Ininiwak, Anisininewuk, Dakota Oyate, Dene and Inuit, and on the National Homeland of the Red River Métis.

UM recognizes that the Treaties signed on these lands are a lifelong, enduring relationship, and we are dedicated to upholding their spirit and intent. We acknowledge the harms and mistakes of the past and the present. With this understanding, we commit to supporting Indigenous excellence through active Reconciliation, meaningful change, and the creation of an environment where everyone can thrive. Our collaboration with Indigenous communities is grounded in respect and reciprocity and this guides how we move forward as an institution.

Accreditation Details

Accreditation Units

- Mathematics: 0%
- Natural Science: 0%
- Complementary Studies: 0%
- Engineering Science: 100%
- Engineering Design: 0%

Graduate Attributes

KB: A knowledge base for engineering
PA: Problem analysis
IN: Investigation
DE: Design
ET: Use of engineering tools
IT: Individual and team work
CS: Communication skills
PR: Professionalism
IE: Impact of engineering on society/ environment
EE: Ethics and equity
EP: Economics and project management
LL: Life-long learning

Competency Levels

I - Introduced (Introductory)
D - Developed (Intermediate)
A - Applied (Advanced)

Evaluation

Students must receive a minimum of 50% on the final examination in order to be eligible to receive a passing grade. Students who are unable to write a quiz during the designated time for medical (or other acceptable) reasons will have to use that quiz as one of their dropped quizzes. Students must complete all the laboratories in order to be eligible to receive a passing grade.

Component	Value (%)	Method of Feedback	Learning Outcomes Evaluated
Quizzes (Best 5 of 7) ❖	35	F, S	1, 2, 3, 4, 5
Laboratories	10	F, S	1, 2, 3, 4, 5
Final Examination	55	S	1, 2, 3, 4, 5

* Method of Feedback: **F** - Formative (written comments and/or oral discussion), **S** - summative (numerical grade)

❖ Marks from a student's best five quizzes will be used. Quizzes will be held during the last 20 minutes of designated tutorial periods.

CEAB Graduate Attributes Assessed

KB.3 – Recalls and defines, and/or comprehends and applies information, first principles, and concept in fundamental engineering science.

IN.1 – Gathers information (literature review, measurements, experiments, laboratory exercises) and analyzes data.

Student Absences

Attendance in lectures, tutorials, and laboratories is mandatory. For short-term absences due to illness or other extenuating circumstances of 120 hours (5 days) or less, students are required to complete a *Self-Declaration Form for Brief or Temporary Absence* available on the University website.🔗 This form must be submitted to the course instructor within 48 hours of the absence. (No additional documentation is required.)
Note that students are responsible to complete any missed work and must consult with the instructor to make appropriate arrangements.
For absences longer than 120 hours, students must contact the instructor and ECE Undergraduate Advisor, Tammy Holowachuk (Tammy.Holowachuk@umanitoba.ca) for further instructions.

Deferred Final Examinations

Students who miss the regular scheduled writing of a final examination, for valid medical or compassionate reasons, may be given the opportunity to write a deferred examination, subject to approval by the Associate Dean (Undergraduate). All requests for a deferred examination must be made within 48 hours of the missed examination, and must follow the procedure described on the Faculty website, without exception. Course instructors do not have the discretion to grant deferred final examinations. (https://umanitoba.ca/engineering/student-experience#engineering-student-policies)

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* on *Academic Integrity*, students are reminded that plagiarism or any other form of cheating in examinations, term tests, assignments, projects, or laboratory reports is subject to serious academic penalty (e.g. suspension or expulsion from the faculty or university). A student found guilty of contributing to cheating by another student is also subject to serious academic penalty.

Copyright Notice

Grading Scale

Letter	Mark
A+	95–100
A	85–94
B+	80–84
B	70–79
C+	65–69
C	55–64
D	45–54
F	< 45

Note: These boundaries represent a guide for the instructor and class alike. Provided that no individual student is disadvantaged, the instructor may vary any of these boundaries to ensure consistency of grading from year-to-year.

Retention of Student Work

Students are advised that copies of their work submitted in completing course requirements (i.e. assignments, laboratory reports, project reports, test papers, examination papers, etc.) may be retained by the instructor and/or the department for the purpose of student assessment and grading, and to support the ongoing accreditation of each Engineering program. This material shall be handled in accordance with the University's *Intellectual Property Policy* and the protection of privacy provisions of *The Freedom of Information and Protection of Privacy Act (Manitoba)*. Students who do not wish to have their work retained must inform the Head of Department, in writing, at their earliest opportunity.

Requirements and Regulations

- Attendance at lectures and laboratories is essential for successful completion of this course. Students must satisfy each evaluation component in the course to receive a passing final grade.
- It is the responsibility of each student to contact the instructor in a timely manner if he or she is uncertain about his or her standing in the course and about his or her potential for receiving a failing grade. Students should also familiarize themselves with the University's *General Academic Regulations*, as well as Section 3 of the Faculty of Engineering *Academic Regulations* dealing with incomplete term work, deferred examinations, attendance and withdrawal.
- No programmable devices or systems (such as calculators, PDAs, iPods, iPads, cell phones, wireless communication or data storage devices) are allowed in examinations unless approved by the course instructor.
- Students should be aware that they have access to an extensive range of resources and support organizations. These include Academic Resources, Counselling, Advocacy and Accessibility Offices as well as documentation of key University policies e.g. Academic Integrity, Respectful Behaviour, Examinations and related matters.

Supplemental Resources