



COURSE OUTLINE WINTER 2021

	Date	Initials
Prepared by Instructor	04-Jan-21	NRB
Approved by Head		

1. Calendar Information

ENGG 225

Fundamentals of Electrical Circuits and Machines

Current, voltage and power; Kirchhoff's current and voltage laws; capacitors; electricity and magnetism fundamentals applied to circuit elements and machines; inductors; topics in electrical circuits and systems; instrumentation; circuit design, DC and AC circuit analysis methods; DC and AC machines; first order circuits and transient analysis

Course Hours: 3 units; H(4-3/2)

Academic Credit: 3

Calendar Reference: <http://www.ucalgary.ca/pubs/calendar/current/engineering.html#30143>

2. Learning Outcomes

At the end of this course, you will be able to:

- 1 Apply fundamentally important circuit laws, including Ohm's and Kirchhoff's laws, using precisely defined conventions for voltage, current, and power.
- 2 Analyze DC circuits using well-established systematic methods, including node voltage analysis, mesh-current analysis, Thevenin and Norton equivalent circuits, and superposition.
- 3 Analyze circuits employing operational amplifiers, including analysis and design of inverting, non-inverting, and other useful amplifier circuits.
- 4 Predict the time-domain voltage-current behaviour, power, and energy of capacitors and inductors.
- 5 Perform steady-state sinusoidal analysis of AC circuits using the same circuit analysis methods as used in DC circuits, instead using complex impedances and phasors.
- 6 Determine complex power in AC circuits, including average power, reactive power, and power factor.
- 7 Analyze DC motor and generator circuits in common machine configurations, such as separately-excited, shunt-connected, and series-connected; you will be able to relate electrical current, voltage, and power to physical torque, power, and shaft speed.

3. Timetable

Section	Day(s) of the Week	Time	Location
LEC 01	MWF	09:00-09:50	Web-based section
	R	08:00-08:50	Web-based section
LAB B01	F	11:00-13:50	Web-based section
LAB B02	F	11:00-13:50	Web-based section
LEC 02	MTWF	08:00-08:50	Web-based section
LAB B01	T	14:00-16:50	Web-based section
LAB B02	T	14:00-16:50	Web-based section
LEC 03	TR	14:00-15:15	Web-based section
	F	10:00-10:50	Web-based section
LAB B01	T	8:00-10:50	Web-based section
LAB B02	T	8:00-10:50	Web-based section

4. Course Instructors

Course Coordinator

Section	First Name	Family Name	Phone	Office	Email
L02	Norm	Bartley	220-5060	ICT 306	nbartley@ucalgary.ca

Other Instructors

Section	First Name	Family Name	Phone	Office	Email
L01	Pouyan (Yani)	Jazayeri	220-8714	ICT 344	spiazave@ucalgary.ca
L03	Anis	Haque	220-8606	ICT 307	anis@ucalgary.ca

5. Examinations

1. **Midterm examination:** The midterm will be an open-book take-home test, and will be designed to require less than 120 minutes to complete for most students. It will be scheduled in coordination with other Winter 2021 courses, but has a due date tentatively scheduled for Thursday, February 25 at 5:00 PM Mountain Time. Students will receive at least 24 hours to complete it. The exam will be posted on D2L at least 24 hours prior to the scheduled due time. The precise format of the exam will be posted well in advance.

2. **Final examination:** To be scheduled by the Registrar's Office. The final examination will also be an open-book take-home exam, and will be designed to require less than 3 hours to complete for most students. Students will receive at least 24 hours to complete it. The exam will be posted on D2L at least 24 hours prior to the scheduled completion time. The precise format of the exam will be posted well in advance.

You will need access to a computer and internet, as well as an ability to scan and upload handwritten work. Microsoft Office Lens is recommended when using a smartphone or tablet to scan handwritten work.

Both the midterm and final exams are open-book and open-notes. You are permitted to access your own course notes, the textbook, a calculator, the course D2L site, and the internet. However, you are to respect academic integrity and not communicate about the exam with other students in the course or with any other person who could give you unfair help with the questions.

6. Use of Calculators in Examinations

There will be no restrictions on use of calculators or computers in exams and quizzes.

7. Final Grade Determination

The final grade in this course will be based on the following components:

Component	Learning Outcome(s) Evaluated	Weight
Assignments	1-7	10%
Labs	1-6	15%
Midterm Examination	1-2	25%
Final Examination	1-7	50%

Total: 100%

Notes:

A mark of not less than 35% on the final exam is required in order to pass the course as a whole. The instructors reserve the right to adjust this threshold of 35% if it is judged after marking the final exam that the exam was more difficult than intended.

b) Conversion from a score out of 100 to a letter grade will be done using the conversion chart shown below. This grading scale can only be changed during the term if the grades will not be lowered.

Letter Grade	Total Mark (T)
A+	$T \geq 96.0\%$
A	$88.0\% \leq T < 96.0\%$
A-	$84.0\% \leq T < 88.0\%$
B+	$78.7\% \leq T < 84.0\%$
B	$74.7\% \leq T < 78.7\%$
B-	$70.7\% \leq T < 74.7\%$
C+	$65.3\% \leq T < 70.7\%$
C	$61.3\% \leq T < 65.3\%$
C-	$57.3\% \leq T < 61.3\%$
D+	$52.0\% \leq T < 57.3\%$
D	$48.0\% \leq T < 52.0\%$
F	$T < 48.0\%$

8. Textbook

The following textbook(s) is required for this course:

Title	Engineering 225 (from: Electrical Engineering: Principles and Applications)
Author(s)	Team ENGG 225 (author of full textbook: Allan R. Hambley)
Edition, Year	Customized 7th Edition, 2018
Publisher	Pearson Custom Library (ISBN 10: 1323714871)

9. University of Calgary Policies and Supports

*SSE ADVISING AND POLICIES

All Schulich School of Engineering students have access to a D2L site titled “Engineering Student Centre”. Students have a responsibility to familiarize themselves with the policies available on this site.

*ACADEMIC MISCONDUCT

Academic Misconduct refers to student behavior which compromises proper assessment of a student's academic activities and includes: cheating; fabrication; falsification; plagiarism; unauthorized assistance; failure to comply with an instructor's expectations regarding conduct required of students completing academic assessments in their courses; and failure to comply with exam regulations applied by the Registrar.

For information on the Student Academic Misconduct Policy and Procedure please visit:

<https://ucalgary.ca/policies/files/policies/student-academic-misconduct-policy.pdf>

<https://ucalgary.ca/policies/files/policies/student-academic-misconduct-procedure.pdf>

Additional information is available on the Academic Integrity Website at <https://ucalgary.ca/student-services/student-success/learning/academic-integrity>.

*ACADEMIC ACCOMODATION

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The Student Accommodations policy is available at <https://ucalgary.ca/student-services/access/prospective-students/academic-accommodations>. Students needing an accommodation based on disability or medical concerns should contact Student Accessibility Services (SAS) in accordance with the Procedure for Accommodations for Students with Disabilities (<https://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities.pdf>). Students who require an accommodation in relation to their coursework based on a protected ground other than Disability should communicate this need in writing to their Instructor.

SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit

*INSTRUCTOR INTELLECTUAL PROPERTY

Course materials created by instructors (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the instructor. These materials may NOT be reproduced, redistributed or copied without the explicit consent of the instructor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course at the same time may be allowed under fair dealing.

*FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY

Student information will be collected in accordance with typical (or usual) classroom practice. Students' assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary.

*COPYRIGHT LEGISLATION

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright (<https://www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright-policy.pdf>) and requirements of the copyright act (<https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html>) to ensure they are aware of the consequences of unauthorised sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy <https://www.ucalgary.ca/pubs/calendar/current/k.html>.

*MEDIA RECORDING (if applicable)

Please refer to the following statement on media recording of students: https://elearn.ucalgary.ca/wp-content/uploads/2020/05/Media-Recording-in-Learning-Environments-OSP_FINAL.pdf

**Media recording for lesson capture*

The instructor may use media recordings to capture the delivery of a lecture. These recordings are intended to be used for lecture capture only and will not be used for any other purpose. Although the recording device will be fixed on the Instructor, in the event that incidental student participation is recorded, the instructor will ensure that any identifiable content (video or audio) is masked, or will seek consent to include the identifiable student content to making the content available on University approved platforms.

**Media recording for self-assessment of teaching practices*

The instructor may use media recordings as a tool for self-assessment of their teaching practices. Although the recording device will be fixed on the instructor, it is possible that student participation in the course may be inadvertently captured. These recordings will be used for instructor self-assessment only and will not be used for any other purpose.

**Media recording for the assessment of student learning*

The instructor may use media recordings as part of the assessment of students. This may include but is not limited to classroom discussions, presentations, clinical practice, or skills testing that occur during the course. These recordings will be used for student assessment purposes only and will not be shared or used for any other purpose.

SEXUAL VIOLENCE POLICY

The University recognizes that all members of the University Community should be able to learn, work, teach and live in an environment where they are free from harassment, discrimination, and violence. The University of Calgary's sexual violence policy guides us in how we respond to incidents of sexual violence, including supports available to those who have experienced or witnessed sexual violence, or those who are alleged to have committed sexual violence. It provides clear response procedures and timelines, defines complex concepts, and addresses incidents that occur off-campus in certain circumstances. Please see the policy available at <https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>

*OTHER IMPORTANT INFORMATION

Please visit the Registrar's website at: <https://www.ucalgary.ca/registrar/registration/course-outlines> for additional important information on the following:

- Wellness and Mental Health Resources
- Student Success
- Student Ombuds Office
- Student Union (SU) Information
- Graduate Students' Association (GSA) Information
- Emergency Evacuation/Assembly Points
- Safewalk

10. Statements Specific to Winter 2021

Course Format and Scheduling

The delivery of course content for ENGG 225 is classified as synchronous online learning. Synchronous learning takes place online during the registrar-scheduled class times. Although the course content will be available entirely for viewing asynchronously, the instructors may use the scheduled periods as an opportunity for direct interaction with students.

Expectations for Attendance and Engagement in Online Sessions

Attendance is voluntary.

Guidelines for Completing and Submitting Coursework

Detailed instructions will be issued for submission of all lab work and online assessments.

11. Additional Course Information

Problem Assignments

A problem assignment will be issued regularly. Your assignments are to be submitted for grading by the due dates given.

Laboratories

There will be four laboratory experiments that will be conducted entirely online. The labs are designed to:

- support and extend the lecture material,
- provide practical experience in using electronic instruments,
- explore some practical engineering applications,
- provide valuable hands-on experience in soldering and circuit assembly.

Detailed instructions on laboratory policies and procedures will be given to students well in advance of the first laboratory exercise.