

Course Outline (W2026)

ELE202: Electric Circuit Analysis

Instructor(s)	Dr. Mohamad Shahab [Coordinator] Office: ENG451 Phone: (416) 979-5000 x 556686 Email: mshahab@torontomu.ca Office Hours: 1-2 PM on Tuesdays and Wednesdays; also available other times by appointment Dr. Jonathan Mar Office: EPH 400K Phone: (416) 979-5000 x 557581 Email: jdmar@torontomu.ca Office Hours: Fridays 10:00 - 11:00 am by email
Calendar Description	This course is a one semester introductory course in electric circuit analysis. The topics covered include the following: circuit variables and elements, resistive circuits, methods of circuit analysis, circuit theorems, energy storage elements, transient responses of RL and RC circuits, sinusoidal steady state analysis, and AC steady state power concepts. (1 hr. Tutorial and 3 hr. Lab every other week)
Prerequisites	MTH 140 and MTH 141
Antirequisites	None
Corerequisites	None
Compulsory Text(s):	1. Fundamentals of Electric Circuits, 7th Edition by C.K. Alexander & M.N. Sadiku, published by McGraw-Hill, 2021. <u>Note:</u> According to the textbook's publisher, purchasing options include both print & e-book versions of the textbook with costs between C\$59-C\$129.95. Check the publisher's website for more information. Also, this textbook is available for short-term loan at the TMU Library. For more information check https://library.torontomu.ca/services/borrower/textbook-collection/ 2. ELE202 Laboratory Manuals, by M.S. Kassam, S. Hussain & K. Tang, Toronto Metropolitan University, ECBE Department, 2021. (Available in the course shell on D2L: https://courses.torontomu.ca/)
Reference Text(s):	1. No reference text.
Learning Objectives (Indicators)	At the end of this course, the successful student will be able to: 1. Recognize and describe terminologies and concepts related to university-level natural sciences; Recalls and states first principles and theories in university-level natural sciences.

	- Develops linear equations based on different circuit configurations. Solve linear equations using variable elimination or Cramer rule. (1b) 2. Recognize and describe terminologies and concepts related to university-level natural sciences; Recalls and states first principles and theories in university-level natural sciences. - Understands, interprets, articulates, and applies the basic voltage and current laws in the identification, formulation, and solution of the basic problem of circuit analysis. (1a) 3. Understand mathematical models used to describe engineering systems; Make valid assumptions based on available information; Apply mathematics and computations to solve mathematical models. - Conducts experiments using the basic principles of circuit analysis and analyze and interpret the obtained results. (2a) 4. Use appropriate measurement techniques/devices/computer aided design tools to conduct experiments/synthesis; Know measurement errors in instrumentation, human, and environment and the limitations of engineering tools; Follow protocols and safety procedures in conducting experiments. - Uses current and voltage measurement instruments, including volt/current meters and oscilloscope to measure the voltage and current characteristics of various circuits. (5a) NOTE:Numbers in parentheses refer to the graduate attributes required by the Canadian Engineering Accreditation Board (CEAB).														
Course Organization	4.0 hours of lecture per week for 13 weeks 1.5 hours of lab per week for 12 weeks 0.5 hours of tutorial per week for 12 weeks														
Teaching Assistants	• Seham Al Abdul Wahid (AA Coordinator) [salabdulwahid@torontomu.ca] • Abdulghani Aljundi [abdulghani1.aljundi@torontomu.ca] • Abdulrahman Emam [abdulrahman.emam@torontomu.ca] • Mohammad Khoobani [mohammad.khoobani@torontomu.ca] • Mohammadreza Maleki [mohammadreza1.maleki@torontomu.ca] • Nikoo Alavi [nikoo.alavi@torontomu.ca] • Osama Harmouche [oharmouche@torontomu.ca] • Salma Mohamed [salma.mohamed@torontomu.ca] • Sima Darbasi [sima.darbasi@torontomu.ca] • Sravya Reddy Yammanuru [sravya.yammanuru@torontomu.ca]														
Course Evaluation	<table> <tr> <th colspan="2">Theory</th></tr> <tr> <td>Mid-term Exam</td><td>26 %</td></tr> <tr> <td>Quizzes</td><td>10 %</td></tr> <tr> <td>Final Exam</td><td>40 %</td></tr> <tr> <th colspan="2">Laboratory</th></tr> <tr> <td>Labs - 6x4%</td><td>24 %</td></tr> <tr> <td>TOTAL:</td><td>100 %</td></tr> </table> Note: In order for a student to pass a course, a minimum overall course mark of 50% must be obtained. In addition, for courses that have both "Theory and Laboratory" components, the student must pass the Laboratory and Theory portions separately by achieving a minimum of 50% in the combined Laboratory components and 50% in the combined Theory components. Please	Theory		Mid-term Exam	26 %	Quizzes	10 %	Final Exam	40 %	Laboratory		Labs - 6x4%	24 %	TOTAL:	100 %
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	refer to the "Course Evaluation" section above for details on the Theory and Laboratory components (if applicable).
Examinations	<u>Quizzes:</u> Each Quiz will consist of problem-solving questions and will be scheduled during designated tutorial sessions. A tutorial session will be held before the Quiz. Check the lab/tutorial schedule for the quizzes' scheduling. <u>Mid-term exam:</u> The mid-term exam is scheduled in Week 8, on Tuesday, 3 March 2026, during the regular lecture hours. The mid-term exam covers lecture and laboratory material up to Week 8. Further details will be announced on D2L (https://courses.torontomu.ca/) and in class. <u>Final exam:</u> The final exam will be held during the university's final examination period. The duration will be 3 hours (covers all course material). Further details will be announced on D2L (https://courses.torontomu.ca/) and in class. All quizzes, the mid-term exam, and the final exam will be closed-book/closed-notes examinations and will be administered in-person.
Other Evaluation Information	<u>Lab Work:</u> - Each lab experiment is to be done individually, and consists of Pre-Lab Work, In-Lab Work and Post-Lab Work. - Pre-Lab Work must be submitted (uploaded) to D2L prior to the start of student's scheduled lab session. - The Lab Report, consisting of the In-Lab Work and Post-Lab Work, is to be submitted (uploaded) to D2L within 24 hours of the completion of the experiment. - Refer to each lab description and information posted on the course shell in D2L for evaluation and lab submission requirements.
Teaching Methods	- Lectures will be held in-person in the designated classroom for each section. - During lectures, slides will be expanded with additional notes. - The In-Lab Work and tutorials are to be undertaken in person in the designated laboratory room for each section. Students should carefully check their schedule for the room locations of the lecture classes and lab/tutorial sessions. Each student must attend the lab/tutorial session on the day and at the time specified for their section. - Lab attendance is mandatory. - Announcements will be announced in class and posted to the course shell on D2L (https://courses.torontomu.ca/). - Practice problems will be provided.
Other Information	Each student is required to purchase a Laboratory Kit (Lab Kit) and to download the licensed version of the MultiSIM circuit simulation software tool. Please refer to the course shell on D2L for more instructions/requirements on purchasing the Lab Kit and downloading the MultiSIM circuit simulation software tool. Each Lab Kit costs no more than C\$60 before tax. In accordance with the Policy on TMU Student E-mail Accounts (Policy 157), the university requires that any electronic communication by students to TMU faculty or staff be sent from their official university email account. Use of Generative AI (e.g. ChatGPT, Grammarly, Perplexity) to develop or assist with any ideas or material submitted for coursework is expressly prohibited in this course. Use of Generative AI in this manner will be considered a breach of Policy 60.

Course Content

Week	Hours	Chapters / Section	Topic, description
Week 1	4	1/1.1-1.7	Basic Concepts
Week 2	4	2/2.1-2.8	Basic Laws
Weeks 3 & 4	8	3/3.1-3.7	Methods of Analysis
Weeks 5 & 6	8	4/4.1-4.8 and 4.10	Circuit Theorems
Study/reading week	0	==	No classes during the week of 16 Feb (Study/reading week)
Weeks 7 & 8	8	6/6.1-6.5, 7/7.1-7.6 and 7.9	First Order Circuits <i>[Mid-Term Exam on Tuesday, 03 March 2026, during the regular lecture hours]</i>
Weeks 9 & 10	8	9/9.1-9.8	Sinusoids and Phasors
Week 11	4	10/10.1-10.3	Sinusoidal Steady State Analysis
Week 12	4	10/10.4-10.6 and 11/11.1-11.3	Sinusoidal Steady State Analysis (continued) AC Power Analysis
Week 13	4	11/11.4-11.7	AC Power Analysis Review

Laboratory(L)/Tutorials(T)/Activity(A) Schedule

Week	L/T/A	Description
Week 1	No Lab	No Lab => Each student is required to purchase a Lab Kit and to download the licensed version of the Multisim circuit simulation software tool. Refer to the course shell on D2L for more information.
Week 2	Tutorial	Tutorial 1 & Quiz 1
Week 3	Lab	Introduction to Basic Lab Equipment, Tools,& DC Measurements (Lab 1 in the manual)
Week 4	Tutorial	Tutorial 2 & Quiz 2
Week 5	Lab	Basic Concepts, Relationships and Laws of Electric Circuits (Lab 2 in the manual)
Week 6	Tutorial	Tutorial 3 & Quiz 3
Study/reading week	==	No labs/tutorials during the week of 16 Feb (Study/reading week)
Week 7	Lab	Resistive Network Analysis Methods - Nodal and Mesh (Lab 3 in the manual)
Week 8	Lab	Circuit Theorems and the Superposition Principle (Lab 4 in the manual)
Week 9	Tutorial	Tutorial 4 & Quiz 4
Week 10	Lab	Transient Response of First-Order R-C and R-L Circuits (Lab 6 in the manual)
Week 11	Lab	Sinusoidal Steady-State Response of Simple R-C and R-L Circuits (Lab 7 in the manual)
Week 12	Tutorial	Tutorial 5 [University will be closed on Friday, 3 April (Good Friday)]

Week 13	Tutorial	Tutorial 6 & Quiz 5
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University Policies & Important Information

Students are reminded that they are required to adhere to all relevant university policies found in their online course shell in D2L and/or on [the Senate website](#)

Refer to the [Departmental FAQ page](#) for further information on common questions.

Important Resources Available at Toronto Metropolitan University

- [The University Libraries](#) provide research [workshops](#) and individual consultation appointments. There is a drop-in Research Help desk on the second floor of the library, and students can use the [Library's virtual research help service](#) to speak with a librarian, or [book an appointment](#) to meet in person or online.
- [Student Life and Learning Support](#) offers group-based and individual help with writing, math, study skills, and transition support, as well as [resources and checklists to support students as online learners](#).
- You can submit an [Academic Consideration Request](#) when an extenuating circumstance has occurred that has significantly impacted your ability to fulfill an academic requirement. You may always visit the [Senate website](#) and select the blue radio button on the top right hand side entitled: Academic Consideration Request (ACR) to submit this request.

For Extenuating Circumstances, [Policy 167: Academic Consideration](#) allows for a once per semester ACR request without supporting documentation if the absence is less than 3 days in duration and is not for a final exam/final assessment. Absences more than 3 days in duration and those that involve a final exam/final assessment, always require documentation. Students must notify their faculty/contract lecturer once a request for academic consideration is submitted. See Senate [Policy 167: Academic Consideration](#).

Longer absences are not addressed through Policy 167 and should be discussed with your Chair/Director/Program to be advised on next steps.

- [FAQs Academic Considerations and Appeals](#)
- Information on Copyright for [Faculty/Contract Lecturers](#) and [students](#).

Lab Safety (if applicable)

Students are to strictly adhere and follow:

- a. The Lab Safety information/guidelines posted in the respective labs,
- b. provided in their respective lab handouts, and
- c. instructions provided by the Teaching Assistants/Course instructors/Technical Staff.

During the lab sessions, to avoid tripping hazards, the area around the lab stations should not be surrounded by bags, backpacks etc, students should place their bags, backpacks etc against the walls of the labs and/or away from their lab stations in such a way that it avoids tripping hazards.

Accessibility

- Similar to an [accessibility statement](#), use this section to describe your commitment to making this course accessible to students with disabilities. Improving the accessibility of your course helps minimize the need for accommodation.
- Outline any technologies used in this course and any known accessibility features or barriers (if applicable).
- Describe how a student should contact you if they discover an accessibility barrier with any course materials or technologies.

Academic Accommodation Support

Academic Accommodation Support (AAS) is the university's disability services office. AAS works directly with incoming and returning students looking for help with their academic accommodations. AAS works with any student who requires academic accommodation regardless of program or course load.

- Learn more about [Academic Accommodation Support](#).
- Learn [how to register with AAS](#).
- Learn about [Policy 159: Academic Accommodation of Students with Disabilities](#)

Academic Accommodations (for students with disabilities) and Academic Consideration (for students faced with extenuating circumstances that can include short-term health issues) are governed by two different university policies. Learn more about [Academic Accommodations versus Academic Consideration and how to access each](#).

Wellbeing Support

At Toronto Metropolitan University, we recognize that things can come up throughout the term that may interfere with a student's ability to succeed in their coursework. These circumstances are outside of one's control and can have a serious impact on physical and mental well-being. Seeking help can be a challenge, especially in those times of crisis.

If you are experiencing a mental health crisis, please call 911 and go to the nearest hospital emergency room. You can also access these outside resources at anytime:

- **Distress Line:** 24/7 line for if you are in crisis, feeling suicidal or in need of emotional support (phone: 416-408-4357)
- **Good2Talk:** 24/7-hour line for postsecondary students (phone: 1-866-925-5454)
- **Keep.meSAFE:** 24/7 access to confidential support through counsellors via [My SSP app](#) or 1-844-451-9700

If non-crisis support is needed, you can access these campus resources:

- **Centre for Student Development and Counselling:** 416-979-5195 or email csdc@torontomu.ca
- **Consent Comes First - Office of Sexual Violence Support and Education:** 416-919-5000 ext 3596 or email osvse@torontomu.ca
- **Medical Centre:** call (416) 979-5070 to book an appointment

We encourage all Toronto Metropolitan University community members to access available resources to ensure support is reachable. You can find more resources available through the [Toronto Metropolitan University Mental Health and Wellbeing](#) website.