

Course Outline (W2024)

ELE202: Electric Circuit Analysis

Instructor(s)	Dr. Farah Mohammadi [Coordinator] Office: ENG461 Phone: (416) 979-5000 x 556094 Email: fmohamma@torontomu.ca Office Hours: Tuesdays 2 to 4 pm
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):	<ol style="list-style-type: none"> 1. Fundamentals of Electric Circuits, 7th Edition by C.K. Alexander & M.N. Sadiku, published by McGraw-Hill. 2. ELE202: Lecture Notes, The lecture notes are available on D2L.
Reference Text(s):	<ol style="list-style-type: none"> 1. No reference text. 2. Each student is required to purchase a Laboratory Kit and to download the licensed version of the MultiSIM circuit simulation software tool. 3. Refer to the course website on D2L for more instructions on when and where to buy the Labkit from and how to download the MultiSIM circuit simulation software tool.
Learning Objectives (Indicators)	<p>At the end of this course, the successful student will be able to:</p> <ol style="list-style-type: none"> 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

Rupinder Kaur(rupinder.kaur.ece@torontomu.ca)- TA Coordinator
 Hamed Mohammadkazemi(hmohammadkazemi@torontomu.ca)
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Course Evaluation

Theory	
Midterm Exam	22 %
Quiz - 5 quizzes each worth 2%	10 %
Final Exam	40 %
Laboratory	
Labs - 7 labs each worth 4%	28 %
TOTAL:	100 %

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 refer to the "**Course Evaluation**" section above for details on the Theory and Laboratory components (if applicable).

Examinations

- Midterm exam is scheduled in Week 8, for the duration of 2 hours, (covers Weeks 1-8 of lecture and laboratory material). The date and time of the midterm exam is on Tuesday, March 5th during the regular lecture hours. It will be a closed book exam.

- Final exam will be held during exam period. The duration will be 3 hours, (covers all course material)
 It will also be a closed book exam

Other Evaluation Information	<p>- All quizzes, mid-term test and final examination will be closed book/ closed notes and will be administered in-person.</p> <p>LAB WORK: Each lab experiment is to be done individually, and comprises of Pre-Lab Work, In-Lab Work and Post-Lab Work. Pre-Lab Work must be submitted (uploaded) online prior to the start of student's scheduled lab period. 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 website for evaluation and lab submission requirements).</p> <p>QUIZZES: Each Quiz will comprise of problem questions, and scheduled during designated tutorial period. A tutorial session will be held before the Quiz.</p>
Teaching Methods	<p>Lectures will be held in-person in the designated classroom.</p> <p>The In-Lab Work and tutorials to be undertaken in-person in the designated Laboratory room. Please carefully check your schedule for location of the lecture and lab classes.</p> <p>The lab attendance is mandatory.</p>
Other Information	<p>As noted earlier, each student is required to purchase a Laboratory Kit and to download the licensed version of the MultiSIM circuit simulation software tool. Please refer to the course website on D2L for more instructions/requirements.</p>

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
Week 3	4	3/3.1-3.3	Methods of Analysis
Week 4	4	3/3.4-3.7	Methods of Analysis(Continued)
Week 5	4	4/4.1-4.5	Circuit Theorems
Week 6	4	4/4.6-4.8 and 4.10	Circuit Theorems(Continued)

Week 7	4	7/7.1-7.4	First Order Circuits
			Study week
Week 8	4	7/7.5-7.6 and 7.9	First Order Circuits (Continued) Mid Term Exam on Tuesday, March 5th
Week 9	4	9/9.1-9.4	Sinusoids and Phasors
Week 10	4	9/9.5-9.8	Sinusoids and Phasors (Continued)
Week 11	4	10/10.1-10.3	Sinusoidal Steady State Analysis
Week 12	4	10/10.4-10.6; 11/11.1-11.2	Sinusoidal Steady State Analysis (Continued) AC Power Analysis
Week 13	4	11/11.4,11.6	AC Power Analysis (Continued) and Review

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

Week	L/T/A	Description
1	No Lab	NO LAB => Each student is required to purchase a Laboratory Kit and to download the licensed version of the MultiSIM circuit simulation software tool. Refer to the course website on D2L for more information.
2	Tutorial/Quiz #1	Tutorial & Quiz #1 on Chapters sections: 1.1-1.7; 2.1-2.8

3	Lab #1	Introduction to Basic Lab Equipment, Circuit Tools & DC Measurements
4	Lab #2	Basic Concepts, Relationships and Laws of Electric Circuits
5	Tutorial/Quiz #2	Tutorial & QUIZ #2 on Chapters sections: 3.1-3.7
6	Tutorial/Quiz #3	Tutorial & QUIZ #3 on Chapters sections: 4.1-4.8,4.10
7	Lab #3	Resistive Network Analysis Methods Nodal and Mesh
8	Lab #4	Circuit Theorems and the Superposition Principle
9	Tutorial/Quiz #4	Tutorial & QUIZ #4 on Chapters sections: 7.1-7.6,7.9
10	Lab #5	Introduction to Function Generator, Oscilloscope, & AC Measurements
11	Lab #6	Transient Response of First Order R-C and R-L Circuits
12	Tutorial/Quiz #5	Tutorial & QUIZ #5 on Chapters sections: 9.1-9.8; and 10.1-10.6
13	Lab #7	Sinusoidal Steady-State Response of Simple R-C and R-L Circuits

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 Library](#) provides research [workshops](#) and individual assistance. If the University is open, there is a Research Help desk on the second floor of the library, or students can use the [Library's virtual research help service](#) to speak with a librarian.
- [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, require documentation. Students must notify their instructor once a request for academic consideration is submitted. See Senate [Policy 167: Academic Consideration](#).

- If a student is requesting accommodation due to a religious, Aboriginal and/or spiritual observance, they must submit their request via the online [Academic Consideration Request \(ACR\) system](#) **within the first two weeks of the class or, for a final examination, within two weeks of the posting of the examination schedule**. If the required absence occurs within the first two weeks of classes, or the dates are not known well in advance as they are linked to other conditions, these requests should be submitted with as much lead time as possible in advance of the required absence.
- If taking a remote course, familiarize yourself with the tools you will need to use for remote learning. The [Remote Learning Guide](#) for students includes guides to completing quizzes or exams in D2L Brightspace, with or without [Respondus LockDown Browser and Monitor, using D2L Brightspace](#), joining online meetings or lectures, and collaborating with the Google Suite.
- Information on Copyright for [Faculty](#) and [students](#).

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](#).

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.