MAT290H1F: ADVANCED ENGINEERING MATHEMATICS - COURSE SYLLABUS FOR FALL 2023

BASIC COURSE DESCRIPTION

This is a course designed to prepare students for use of essential mathematical concepts and techniques for Electrical and Computer Engineering applications. It covers basics of Complex Analysis, Differential Equations and Laplace Transforms. Topics include: ordinary linear differential equations; transform methods; complex numbers and the complex plane; the logarithmic and exponential functions; complex functions; limits and continuity; derivatives and integrals; analytic functions and the Cauchy-Riemann equations; power series as analytic functions; Cauchy's integral theorem, Cauchy's integral formula, Laurent series, the Residue Theorem, computation of real integrals using residues, the inversion formula for the Laplace transform. Examples are drawn mostly from electrical circuit systems. Official calendar description can be found here.

INSTRUCTORS

Lecture Section	Instructor	Office Hours	Email
LEC0101 and LEC0102	Adrian Nachman (course coordinator)	Thursdays 8 – 9 PM Through Zoom	adrian.nachman@utoronto.ca
LEC0103 and LEC0104	Micah Stickel	Mondays 2 – 3 PM (Group) Wednesdays 2 – 3 PM (Individual)	m.stickel@utoronto.ca

EMAIL AND OFFICE HOURS

If you need to send us an email message, make sure to use the above addresses and **include MAT290 in the subject line**. Office hours will be held over Zoom or Teams.

PIAZZA

We will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TAs, and your instructors. Rather than emailing questions to the teaching staff, we encourage you to post your questions on Piazza.

Our course Piazza page is accessible through the main Quercus page, or through this direct link: https://piazza.com/utoronto.ca/fall2023/mat290h1f

TEXTBOOK

The **required** textbook for this course is:
Dennis G. Zill, *Advanced Engineering Mathematics*, 7th Ed Jones and Bartlett Publishers.
Available in both printed (ISBN: 97815284250091) and e-text (ISBN: 9781284231861) formats.

LEARNING OUTCOMES

- Formulate **mathematical models** for circuits.
- Gain mastery of various methods (including but not limited to use of the **Laplace Transform**) for **solving** corresponding ordinary **differential equations** and for **interpreting the results**.
- Learn and understand basic theorems of **Complex Analysis**.
- Use Complex Analysis methods to **compute** certain **integrals** and **inverse Laplace transforms**.

HOMEWORK

It is **essential** for your success in the course**, and for your learning experience,** that you **work through all the homework problems assigned each week** *before* attending your tutorial.

WEEKLY READING ASSIGNMENTS

In each week's problem set a reading assignment will be included. The lectures in this course are designed to explain the most important and/or difficult parts of the textbook, so not every detail of the **material which you are responsible for** will be discussed in lectures. **Make sure you work through the assigned sections of the book.**

The weekly readings will also help you keep up in this course. It is a small investment that will make a big difference when you go to write your quizzes and final exam.

QUIZZES

We will have **9 quizzes** this semester. These **are meant to test whether you have understood the lectures, read the assigned sections in the textbook and have solved the homework problems.** There will be no make-up quizzes. We will take the best 8 of the 9 quizzes for this component of your course grade. The first quiz is scheduled for Monday Sept. 25 in your 4-5 pm tutorials. Further details about the quizzes will be posted on the Quercus page of the course.

COURSE MARKS

Quizzes 56% (Best 8 of 9), Final Exam 44%
Please note that due to unforeseen circumstances, dates and percentages of the course assessments are subject to change.

STATEMENT ON INCLUSIVITY

Looking for community? Feeling isolated? Not being understood or heard?
You are not alone. You can talk to anyone in the Faculty that you feel comfortable approaching, anytime – professors, instructors, teaching assistants, first-year or upper years academic advisors, student leaders or the Assistant Dean of Diversity, Inclusion and Professionalism.

You belong here. In this class, the participation and perspectives of everyone is invited and encouraged. The broad range of identities and the intersections of those identities are valued and create an inclusive team environment that will help you achieve academic success. You can read the evidence for this approach here.

You have rights. The University Code of Student Conduct and the Ontario Human Rights Code protect you against all forms of harassment or discrimination, including but not limited to acts of racism, sexism, Islamophobia, antisemitism, homophobia, transphobia, ableism, classism and ageism. Engineering denounces unprofessionalism or intolerance in language, actions or interactions, in person or online, on- or off-campus. Engineering takes these concerns extremely seriously and you can confidentially disclose directly to the Assistant Dean for help here.

Resource List:

- Engineering Equity, Diversity & Inclusion Groups, Initiatives & Student Resources
- Engineering Positive Space Resources
- Request a religious-based accommodation here
- Email Marisa Sterling, P.Eng, the Assistant Dean, Diversity, Inclusion &Professionalism here
- Make a confidential disclosure of harassment, discrimination or unprofessionalism here or email disclosure.engineering@utoronto.ca or call 416.946.3986
- Email the Engineering Society Equity & Inclusivity Director here
- U of T Equity Offices & First Nations House Resources

LAND ACKNOWLEDGEMENT AND INDIGENOUS STUDENT SUPPORT

Land Acknowledgement
We wish to acknowledge this land on which the University of Toronto operates. For thousands of years, it has been the traditional land of the Huron-Wendat, the Seneca, and the Mississaugas of the Credit. Today, this meeting place is still the home to many Indigenous people from across Turtle Island and we are grateful to have the opportunity to work on this land.

Learn more about Canada's relationship with Indigenous Peoples here.

Indigenous Students' Supports
If you are an Indigenous engineering student, you are invited to join a private Discord channel to meet other Indigenous students, professors, and staff, chat about scholarships, awards, work opportunities, Indigenous-related events, and receive mentorship. Email Professor Bazylak or Darlee Gerrard if you are interested.

Indigenous students at U of T are also invited to visit First Nations House's (FNH) Indigenous Student Services for culturally relevant programs and services. If you want more information on how to apply for Indigenous specific funding opportunities, cultural programs, traditional medicines, academic support, monthly social events or receive the weekly newsletter, go to the FNH website, email or follow FNH on social media: Facebook, Instagram, or TikTok. A full event calendar is on the CLNX platform. Check CLNX often to see what new events are added!

Statement on Accomodations

The University of Toronto supports accommodations for students with diverse learning needs, which may be associated with mental health conditions, learning disabilities, autism spectrum, ADHD, mobility impairments, functional/fine motor impairments, concussion or head injury, visual impairments, chronic health conditions, addictions, D/deaf, deafened or hard of hearing, communication disorders and/or temporary disabilities, such as fractures and severe sprains, or recovery from an operation.

If you have a learning need requiring an accommodation the University of Toronto recommends that students register with Accessibility Services as soon as possible.

We know that many students may be hesitant to reach out to Accessibility Services for accommodations. The purpose of academic accommodations is to support students in accessing their academics by helping to remove unfair disadvantages. We can assess your situation, develop an accommodation plan with you, and support you in requesting accommodation for your course work. The process of accommodation is private; we will not share details of your needs or condition with any instructor.

If you feel hesitant to register with us, we encourage you to reach out for further information and resources on how we can support. It may feel difficult to ask for help, but it can make all the difference during your time here.

Phone: 416-978-8060
Email: accessibility.services@utoronto.ca

Statement on Mental Health

As a U of T Engineering student, you have a Departmental Undergraduate Advisor or a Departmental Graduate Administrator who can support you by advising on personal matters that impact your academics. Other resources that you may find helpful are listed on the U of T Engineering Mental Health & Wellness webpage, and a small selection are also included here:

- U of T Engineering's Mental Health Programs Officer
- Accessibility Services & the On-Location Advisor
- Health & Wellness and the On-Location Health & Wellness Engineering Counsellor
- Graduate Engineering Council of Students' Mental Wellness Commission
- SKULE Mental Wellness
- U of T Engineering's Learning Strategist and Academic Success
- Registrar's Office and Scholarships & Financial Aid Office & Advisor

We encourage you to access these resources as soon as you feel you need support; no issue is too small.

If you find yourself feeling distressed and in need of more immediate support, consider reaching out to the counsellors at U of T Telus Health Student Support or visiting U of T Engineering's Urgent Support – Talk to Someone Right Now

Term Work Petitions and Absence Declaration

As of the Fall 2023 term, U of T Engineering students can no longer use ACORN to Self-Declare absences. Instead, all absences and term-work petitions must be filed through the Engineering Portal.

Students can still self-declare an absence without documentation once per term for up to a period of 3 days, as long as the course work missed is not worth more than 15%. All other absences must include the appropriate documentation. More details are found here.

Academic Integrity Policies

Make sure to review and understand these materials:
https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july- 1-2019
http://www.academicintegrity.utoronto.ca/

Notice of Video Recording and Sharing

Some lectures of course, including your participation, will be recorded on video. Course videos and materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation, and are protected by copyright. **Do not download, copy, or share any course or student materials** or videos without the explicit permission of the instructor. For questions about recording and use of videos in which you appear please contact your instructor.