

The University of Western Ontario

London Ontario Canada

Department of Physics and Astronomy

NMM2270A

Course Outline 2025 Fall Session

Instructors:

Dr. A.B. MacIsaac Course Coordinator allanb@uwo.ca

Tutorials: (subject to changes in TA's)

Section	Day	Start	End	Location	TA
003	Friday	3:30 PM			TBD
004	Friday	12:30 PM			TBD
006	Friday	10:30 AM			TBD
008	Monday	11:30 AM			TBD
009	Monday	10:30 AM			TBD
011	Monday	11:30 AM			TBD
012	Friday				TBD

Text Book:

Advanced Engineering Mathematics, 7th edition, Zill (required)
1284231472 (No need to take book to class.)

ISBN-13 978-

Advanced Engineering Mathematics, 6th edition, Zill (required), ISBN 978-1-284-10590-2

Course Description: (note used to be AM2270)

This (half) course is designed to provide all second year engineering students with an introduction to the field of differential equations, with special emphasis on methods and applications that are most useful in the engineering sciences. Topics include first order differential equations of various types, higher order differential equations and methods of solving them, initial and boundary value problems, applications to mass-spring systems and electric RLC circuits, Laplace transform and its use for solving differential equations, systems of linear differential equations, orthogonal functions and Fourier series.

Learning Outcomes:

By the end of the course the student will be able to

- Solve first order linear and non-linear differential equations.
- Solve second order or higher order linear differential equations.
- Solve linear order differential equations with constant coefficients with initial condition(s) by using Laplace transform.
- Construct a physical/engineering problem in the language of differential equations and solve it.
- Solve a system of differential equations by using Laplace transform.
- Define orthogonal functions and compute their inner product.
- Express a periodic function by using Fourier series.

Method of Evaluation:

Quizzes (4 weekly: check calendar): 30%

Midterm (1): 30%

Final Exam (1): 40%

“The Department of Physics and Astronomy may, in exceptional cases, adjust the final course marks in order to conform to Departmental policy.”

Notes:

Material:

All material in the lectures up to the end of the course can be considered testable. In addition, extra material covered in lectures can be tested in quizzes, tests and exams.

Missing Quizzes or Exams:

Missing an exam or quiz will result a grade of zero for that exam or quiz except when permission is granted from Engineering Student Services or by Dr. MacIsaac. If permission is granted, a prorated mark will be assigned.

HELP I HAVE A QUESTION!

What to do when you need help in this new structure? We are going to try and provide a few different avenues for students to access help. You should choose the ones you are most comfortable with bearing in mind that some will provide quicker responses than others and some are only available at limited times.

Options:

1. Use the OWL Forums to ask questions. A TA or Prof. will be responsible for watching the forums Monday to Friday 9 to 5. In addition other students may provide help, if they choose.
2. Email a professor or TA using their uwo email address. The only difference between the forums and email is that other students will not see your email.
3. Ask your TA during your tutorial.
4. Ask Prof. during their Office Hours.
5. Don't forget to check the Resources tab as the Profs. and TA's may post useful materials under this TAB. Your answer might already be waiting for you.

HOW TO DO WELL IN THIS COURSE!

1. Read the text. We follow the text almost religiously so you need to read the text.
2. Note the suggested problems list in RESOURCES. This tells you the sections we will cover and the order we cover them. Important sections will have lots of questions. Sections with only a concept or two we want will have fewer questions.
- 3.A Go to class and listen to the lecture. Bring the PDF in the Course contents section with you to class to take notes on.
- 3.B Watch the lectures in the Course Content tab and take notes from these lectures. I provide you a copy of what would have been written on the whiteboard as a PDF file. You may use that PDF as a start for your own notes. (See 3A)
4. Do as many suggested problems as you can. If you can do all the suggested problems you will do well on any test/quiz/exam.
5. If you have issues from the text, lectures or suggested problems. ASK questions of the TA's or the Profs. No, the Prof doesn't show up for tutorials, so use Office Hours or email.

Addendum to all NNM Course Outlines: (SUBJECT TO REVISION FOR 2025)

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or supporting documentation to the Academic Counseling Office of your home faculty as soon as possible. If you are a Science student, the Academic Counseling Office of the Faculty of Science is located in NCB 280, and can be contacted at scibmsac@uwo.ca. For further information, please consult the university's medical illness policy at http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf

If you miss the Final Exam, please contact your faculty's Academic Counseling Office as soon as you are able to do so. They will assess your eligibility to write the Special Exam (the name given by the university to a makeup Final Exam). You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (see http://www.registrar.uwo.ca/examinations/exam_schedule.html) Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you.

You may also wish to contact Student Accessibility Services (SAS) at 661-2147 if you have any questions regarding accommodations. The policy on Accommodation for Students with Disabilities can be found here: http://www.uwo.ca/univsec/pdf/academic_policies/appeal/accommodation_disabilities.pdf

The policy on Accommodation for Religious Holidays can be found here: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

Learning-skills counselors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered

throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year round through individual counseling.

Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help. Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.

Statements concerning Online Etiquette

Some components of this course will involve online interactions. To ensure the best experience for both you and your classmates, please honour the following rules of etiquette:

- please “arrive” to class/tutorials on time
- please use your computer and/or laptop if possible (as opposed to a cell phone or tablet)
- ensure that you are in a private location to protect the confidentiality of discussions in the event that a class discussion deals with sensitive or personal material
- to minimize background noise, kindly mute your microphone for the entire class until you are invited to speak, unless directed otherwise
- In order to give us optimum bandwidth and web quality, please turn off your video camera for the entire class unless you are invited to speak
- please be prepared to turn your video camera off at the instructor’s request if the internet connection becomes unstable
- unless invited by your instructor, do **not** share your screen in the meeting

The course instructor/TA will act as moderator for the class and will deal with any questions from participants. To participate please consider the following:

- if you wish to speak, use the “raise hand” function and wait for the instructor to acknowledge you before beginning your comment or question
- remember to unmute your microphone and turn on your video camera before speaking
- self-identify when speaking.
- remember to mute your mic and turn off your video camera after speaking (unless directed otherwise)

General considerations of “netiquette”:

- Keep in mind the different cultural and linguistic backgrounds of the other students in the course.
- Be courteous toward the instructor, your colleagues, and authors whose work you are discussing.
- Be respectful of the diversity of viewpoints that you will encounter in the class and in your readings. The exchange of diverse ideas and opinions is part of the scholarly environment. “Flaming” is never appropriate.
- Be professional and scholarly in all online postings. Cite the ideas of others appropriately.

Note that disruptive behaviour of any type during online classes, including inappropriate use of the chat function, is unacceptable. Students found guilty of Zoom-bombing a class or of other serious online offenses may be subject to disciplinary measures under the Code of Student Conduct.

Examination conflicts

A student with examinations having flexible submission times (e.g., where one or more examination is a take-home examination) cannot request alternative arrangements unless a conflict cannot be avoided by rescheduling writing the exam to a different time within the window specified by the instructor. This applies to

direct conflicts as well as “heavy load” conflicts (e.g., three exams within a 23-hour period). The student should discuss any concerns about a potential conflict and/or request accommodation with their academic counselling unit prior to the deadline to drop a course without academic penalty.

In the case of online examinations, an “Examination Conflict Room,” which may be assigned when a student is scheduled to write two proctored exams concurrently, will be interpreted as arrangements for continuous proctoring.

Resources

- For OWL support and other technical support, contact the WTS Helpdesk. [WTS HelpDesk](#):
- [Health and Wellness Support](#): Western has many resources dedicated to supporting remote learners. This includes
- Student Experience has a variety of resources to help you navigate life as an online learner! [Student Experience](#):