Western Science

Department of Physics and Astronomy

Course Outline: NMM 2276b
"Applied Mathematics for Electrical and Mechanical Engineering III"

1. Course Information

Course Information
Numerical and Mathematical Methods 2276a, "Applied Mathematics for Electrical and Mechanical Engineering III"
Winter 2024, Section 001:
Location:

List of Prerequisites
NMM 2270a/b
(or the former Applied Mathematics 2270a/b)

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees if you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor Information

Instructors	Email	Office	Phone	Office Hours
Prof. Blaine A. Chronik	bchronik@uwo.ca		x86455	By appointment
TAs (to be determined)				

Students must use their Western (@uwo.ca) email addresses when contacting their instructors

3. Course Syllabus, Schedule, Delivery Mode

Western Academic Calendar description:
Topics Include: review of vector mathematics, orthogonal expansions of functions and Fourier series and transforms, multiple integration with methods of evaluation in different systems of coordinates, vector fields, line integrals, surface and flux integrals, the Green, Gauss, Stokes, and Divergence theorems with applications.

Proposed Topics (Chapters/Sections refer to Zill, 7th Edition):

Review of vector mathematics (for self-review) (Chapter 7);
Vector functions (differentiation, integration; Section 9.1);
Curvature, arc-length (Section 9.3);
Partial differentiation (Section 9.4);
Directional derivatives and the Gradient Operator (Section 9.5);
Curl and Divergence operators (Section 9.7);
Line integration (Section 9.8);
Path independence and conservative vector fields (Section 9.9);
Double integration (Section 9.10, 9.11);
Green's theorem (Section 9.12);
Surface integration (Section 9.13);
Stoke's theorem (Section 9.14);
Triple integration (Section 9.15);
Divergence theorem (Section 9.16);
Change of variables in multiple integration, the Jacobian (Section 9.17);
Orthogonal functions (review only) (Section 12.1);
Fourier series (review only) (Section 12.2, 12.3, 12.4);
Sturm-Liouville Problems (Section 12.5);
Fourier-Bessel Series (Section 12.6);
Fourier Transforms (Section 15.4)

Delivery Mode and Schedule:

In person lectures (weekly):

Tutorials:

Tuesdays:
Wednesdays:
Wednesdays:
Thursdays:

Key Sessional Dates:

Classes begin:	January 8, 2024
Winter Reading Week:	February 17 - 25, 2024 April
Classes end (final class):	8, 2024
Exam period:	starts April 11, 2024

Contingency plan for in-person class moving to 100% online learning

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, affected course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

4. Course Materials

Textbook (required): "Advanced Engineering Mathematics, 7th Edition", D.G. Zill.

This is the same textbook/edition used in NMM 2270a this year and both 2270 and 2276 last year. The content is very similar to the 6th edition of the same textbook, and students are welcome to use the 6th edition if they have it; however, all responsibilities regarding identifying and navigating any differences between the two editions (particularly in context of problems and/or problem numbers) are that of the student.

All additional course material will be posted to OWL: http://owl.uwo.ca.

All students are responsible for checking the course OWL site (http://owl.uwo.ca) on a regular basis for news and updates.

In person lectures (i.e., "attending class") is the primary method by which information will be disseminated to all students in this course. If any student misses a class, it is his or her responsibility to identify the information covered during that class.

If you need assistance with the course OWL site, they can seek support on the OWL Help page. Alternatively, you can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

5. Methods of Evaluation

The overall course grade will be calculated as listed below:

Assignments	10 %
Midterm Test	35 %
Final Exam	55 %

Only the top (i.e., highest grade) 5 assignments will be used to calculate the 10% assignment contribution to the overall course grade. Each assignment will be worth 2% of the total course grade.

Midterm date: Sunday 11 February 2024,
Midterm make-up date: Wednesday 14 February,

The midterm will cover all course material introduced up to the date of the midterm.

Final exam date: TBD (set by Registrar, between 11 and 30 April 2024)
Final exam made-up date: May 2024 (exact date TBD)

The final exam will be cumulative, covering all material within the scope of the course.

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

6. Student Absences

If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below.

Assessments worth less than 10% of the overall course grade (Assignments):

Of the 6 assignments, only the top 5 will be included in the grade calculation; therefore, you are obviously allowed to miss any single assignment without penalty. An extension of 48 hours (with no penalty) will be allowed for any assignment.

If any additional assignments are missed (regardless of the reason), their weighting (2% per assignment) will be added to the final exam. For example, if all assignments are missed, the final exam will have a 65% weighting for calculation of the final course grade.

No special permission or notification is required in order miss an assignment. If an assignment is missed, the weight will automatically be transferred to the final exam.

Assessments worth 10% or more of the overall course grade (Midterm and Final):

If you miss work totalling 10% or more of the final course grade (i.e., if you miss the midterm or final exam), you must provide valid medical or supporting documentation to the Engineering Academic Counselling Office as soon as possible. For further information, please consult the University's medical illness policy at

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.

The Student Medical Certificate is available at

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

If and only if the Engineering Academic Counselling Office recommends accommodation for the missed assessment, you will be allowed to write the make-up exam for that assessment. If the Counselling office does not recommend accommodation, you will be assigned a grade of 0 for the assessment.

Special notes regarding Absences from the Midterm Examinations

If you cannot write the scheduled midterm make-up exam, you must again provide valid medical or supporting documentation to the Engineering Academic Counselling Office as soon as possible. If and only if the Engineering Academic Counselling Office recommends accommodation, the weight of the midterm will be added to the weight of the final exam (i.e., the final exam will be worth 90% of your course grade).

Special notes regarding Absences from the Final Examinations

You may also be eligible to write the Special Exam (the name given by the University to a makeup Final Exam) if you are in a "Multiple Exam Situation" (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period). In this case you must still contact and obtain a recommendation for academic accommodation from the Engineering Academic Counselling Office.

If you cannot write the final make-up exam, you must again provide valid medical or supporting documentation to the Engineering Academic Counselling Office as soon as possible. If and only if the Engineering Academic Counselling Office recommends accommodation, the date of the next Special Examination will normally be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

7. Accommodation and Accessibility

Religious Accommodation
When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

https://multiculturalcalendar.com/ecal/index.php?s=c-univwo.

Accommodation Policies
Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic Accommodation_disabilities.pdf.

8. Academic Policies

The website for Registrarial Services is http://www.registrar.uwo.ca.

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf,

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

No electronic devices of any kind (including calculators) will be required or permitted during the midterm or final examinations (including make-up or Special Examinations).

Scholastic offences are taken seriously. Students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

In the event of a health lock-down during which in-person examinations are not possible, tests and examinations in this course may be conducted using a remote proctoring service. By taking this course,

you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data) and the session will be **recorded**. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at:

https://remoteproctoring.uwo.ca.

9. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: https://www.uwo.ca/sci/counselling/.

Learning-skills counsellors at the Student Development Centre (https://learning.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 counselling.