Western University
Course Outline Applied Mathematics 9505B
Winter 2022, Partial Differential Equations

Instructor: Greg Reid  
Office: MC 281 (usually out in January, due to Covid restrictions)
Email: reid@uwo.ca  
Always include AM9505 in the subject line of emails.

Course Web Site:  http://owl.uwo.ca

Note on Delivery:  As of Dec 21, 2021, classes will start Monday Jan 10, 2022, and be online until the end of Jan. Delivery (online or in person) after January is still uncertain.

: Below means online by Zoom (in Jan) and will be determined (in person or by Zoom ) depending on public health and UWO guidelines after January.

Instructor’s Office Hour:  Private (1 on 1) by appointment:  Mon 1:30 pm – 2:30 pm

Note I will usually be available at the end of the Wednesday and Friday classes.

It is your responsibility to regularly check the course web site daily for emails, grades, announcements, assignments, important dates etc. Note however that some announcements will be made often only in class.

Lectures:  MWF 12:30 pm – 1:30 pm, usually in real time, i.e. synchronous live if online.

First lecture:  Mon January 10.

Texts:  Both are excellent (Olver is a modern master of PDE, and his book has had 2 million downloads).


It is about $55 USD for as an e-book, or $70 USD in hardcover. [e-version available through the uwo library]

It is about $150 CAD for the e-book. [Available as e-copy (not sure of the quality) via the library].

Prerequisites:

Assumed as background is a standard introductory undergrad course in PDE, where an introduction to separation of variables and Sturm-Liouville problems in 2 variables has been covered.

Outline of Topics


Part 2 (Basic Theory and application for Linear PDE): Topics include initial and boundary value problems in bounded regions (including separation of variables in 3 and higher dimensions). Topics also include generalized functions and Green’s functions for bounded and unbounded regions. We will cover fundamentals of the theory and application of linear partial differential equations with in-homogenous terms by these methods. Introduction to function space techniques.

Nonlinear elliptic PDE (models, eigenvalue problems, stability & bifurcation). Nonlinear Hyperbolic systems of PDE. Applications from the sciences. Some computer tools such as Maple and others will be used to graph, solve and illustrate aspects of the course.

Evaluation

35% – About 5 Assignments (as shown in the schedule) of equal weight
20% – Midterm (as shown in the schedule)
45% – Final Exam (time TBA)

Comments: Assignments will be equally weighted. Makeups for the final exam and midterm and only with the appropriate documentation and approvals by UWO’s process and will be via ProctorTrack. Makeups for the quizzes will be via ProctorTrack or pro-rated grade.

<table>
<thead>
<tr>
<th>Week: Dates</th>
<th>Schedule (tentative) Description</th>
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<tbody>
<tr>
<td>1: Jan 10 – 16</td>
<td>Mon Jan 10: first lecture, 12:30 pm. Part 1 starts (approximately 5 lectures).</td>
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<tr>
<td>2: Jan 17 – 23</td>
<td>Part 2 starts (approximately 12 lectures).</td>
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<td>3: Jan 24 – 30</td>
<td>Assignment 1 due Sun Jan 30: 11:59 pm.</td>
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<td>4: Jan 31 – Feb 6</td>
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<td>5: Feb 7 – 13</td>
<td>Assignment 2 due Sun Feb 13: 11:59 pm.</td>
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<td>6: Feb 14 – 20</td>
<td>Spring Reading Week.</td>
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<td>Feb 19 – 27</td>
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<td>8: Mar 7 – 13</td>
<td>Assignment 4 (A4) due Sun Mar 13: 11:59 pm</td>
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<td>9: Mar 14 – 20</td>
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<td>10: Mar 21 – 27</td>
<td>A5 due Sun Mar 27, 11:59pm</td>
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<td>11: Mar 28 – Apr 3</td>
<td>Friday, April 2, 2022, Easter Friday (Holiday)</td>
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<td>12: Apr 4 – 8</td>
<td>Last week of classes, Last class Fri Apr 8</td>
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<td>Apr 9 – 30</td>
<td>Final Exams April 10 – 30. Sat April 9 (Study Day), Easter Friday Apr 15 (Official Holiday)</td>
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1. Technical Requirements:

- Stable internet connection
- Laptop or computer with installed versions of Maple and Matlab: https://wts.uwo.ca/sitelist/index.html
- Working microphone
- Working webcam
If students need assistance, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800. Google Chrome or Mozilla Firefox are the preferred browsers to optimally use OWL; update your browsers frequently. Students interested in evaluating their internet speed, please click here.

2. Western Academic Policies and Statements

Absence from Course Commitments

Policy on Academic Consideration for Student Absences

Students will have up to two (2) opportunities during the regular academic year to use an on-line portal to self-report an absence during the term, provided the following conditions are met: the absence is no more than 48 hours in duration, and the assessment for which consideration is being sought is worth 30% or less of the student’s final grade. Students are expected to contact their instructors within 24 hours of the end of the period of the self-reported absence, unless noted on the syllabus. Students are not able to use the self-reporting option in the following circumstances:

- for exams scheduled by the Office of the Registrar (e.g., December and April exams)
- absence of a duration greater than 48 hours,
- assessments worth more than 30% of the student's final grade,
- if a student has already used the self-reporting portal twice during the academic year

If the conditions for a Self-Reported Absence are not met, students will need to provide a Student Medical Certificate if the absence is medical or provide appropriate documentation if there are compassionate grounds for the absence in question. Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.

Accommodation for Religious Holidays

The policy on Accommodation for Religious Holidays can be viewed here.

Special Examinations

A Special Examination is any examination other than the regular examination, and it may be offered only with the permission of the Dean of the Faculty in which the student is registered, in consultation with the instructor and Department Chair. Permission to write a Special Examination may be given on the basis of compassionate or medical grounds with appropriate supporting documents. To provide an opportunity for students to recover from the circumstances resulting in a Special Examination, the University has implemented Special Examinations dates. These dates as well as other important information about examinations and academic standing can be found here.

Academic Offenses
“Scholastic offences are taken seriously, and students are directed here to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence.

Accessibility Statement

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Accessible Education (AE) at 661-2111 x 82147 for any specific question regarding an accommodation or review The policy on Accommodation for Students with Disabilities.

Correspondence Statement

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 his/her official university address is attended to in a timely manner. You can read about the privacy and security of the UWQ email accounts here.

3. BMSUE Academic Policies and Statements

Copyright and Audio/Video Recording Statement

Course material produced by faculty is copyrighted and to reproduce this material for any purposes other than your own educational use contravenes Canadian Copyright Laws. You must always ask permission to record another individual and you should never share or distribute recordings.

Rounding of Marks Statement

Across Undergraduate Education programs, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. Final grades on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.4 becomes 74, and 74.5 becomes 75. Marks WILL NOT be bumped to the next grade or GPA, e.g. a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark “bumping” will be denied.

Proctortrack and Zoom

Tests and examinations in this course will be conducted using the remote proctoring service, Proctortrack and Zoom. Note that Proctortrack and Zoom may not be simultaneously used for the same assessment. 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. More information about these remote proctoring services are available at:


Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for these services. Information about the technical requirements are available at the following link and the zoom link above:
When Zoom is used for test/exam invigilation, you will be required to keep your camera on for the entire session, hold up your student card for identification purposes, and share your screen with the invigilator if asked to do so at any time during the exam. The exam session using Zoom will not be recorded. Please note that Zoom servers are located outside Canada. If you would prefer to use only your first name or a nickname to login to Zoom, please provide this information to the instructor in advance of the test or examination.

Use of Recordings

Some remote learning sessions for this course will be recorded. The data captured during these recordings may include your image, voice recordings, chat logs and personal identifiers (name displayed on the screen). The recordings will be used for educational purposes related to this course, including evaluations. The recordings may be disclosed to other individuals under special circumstances. Please contact the instructor if you have any concerns related to session recordings.

Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation, or the participant has the prior written permission of the instructor.

4. Support Services

The following links provide information about support services at Western University.

Academic Counselling (Science and Basic Medical Sciences)
Appeal Procedures
Registrarial Services
Student Development Services
Student Health Services

5. Addendum to all Applied Mathematics Course Outlines

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will 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 in the event that you are dropped from a course for failing to have the necessary prerequisites.

For multiple-choice tests and/or exams: Use may be made of software to check for unusual coincidences in answer patterns that may indicate cheating.

6. Accreditation (AU) Breakdown: Engineering Science = 100%