

UNDERGRADUATE COURSE OUTLINE

1. COURSE INFORMATION

Course Name: Partial Differential Equations I

Course Number: APPLMATH 3815A (Sec 001)

Prerequisite: Either (i) a minimum final mark of 60% in each of Mathematics 1600A/B, Applied Mathematics 2402A, and Calculus 2303A/B (or Calculus 2503A/B), or (ii) a minimum final mark of 60% in both Calculus 2402A/B, and Statistics 2503A/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 in the event that you are dropped from a course for failing to have the necessary prerequisites.

Lectures: Mon/Wed/Fri, 1:30-2:30 PM, SEB 2202

2. INSTRUCTOR INFORMATION

Geoff Wild
Associate Professor
Department of Applied Mathematics

Email: gwild@uwo.ca (put AM 3815 in the subject line please)
Extension: 88784
Office: MC 280
Office Hour: Fri 2:30-3:30 PM

Andrew Day (Teaching Assistant)

Email: aday46@uwo.ca
Office Hour: TBA

3. COURSE SYLLABUS

Content: Boundary value problems for Laplace, heat, and wave equations; derivation of equations; separation of variables; Fourier series; Sturm-Liouville Theory; eigenfunction expansions; cylindrical and spherical problems; Legendre and Bessel functions; spherical harmonics; Fourier and Laplace transforms.

Objective: The objective of the course is to introduce students to certain central concepts of mathematical modelling, especially in the physical sciences.

Outcomes: By the end of the course, the successful student will be able to: (i) recognize prototypical partial differential equations (PDEs) and connect each to the phenomenon it is intended to model; (ii) interpret solutions to a PDE, as well as conditions associated with a PDE, in terms of the phenomenon being modelled; (iii) classify and solve PDEs using various standard techniques (e.g. separation of variables, transforms, method of characteristics).

Expectations Regarding Preparation:

- Students are expected to check owl.uwo.ca regularly for announcements, and information, etc.
- Students are expected to attend all lectures. In the event a student is unable to attend a lecture, it is the student's responsibility to review any material that was missed, for example by checking owl.uwo.ca.
- Students are expected to complete associated readings and suggested exercises from the textbook at a steady pace throughout the term. Students who complete readings and exercises in a short,

- concentrated period of time often receive lower-than-average grades on tests and exams.
- Students are expected to take note of quiz dates and other, course-related deadlines. Except in the case of emergencies, those students seeking accommodation are expected to make their request known to the instructor at least one week prior to a deadline.
- Students are expected to complete quizzes and exams in permanent ink, however pencils and erasable ink are permitted. Grade appeals made by those students who choose something other than permanent ink may not be accepted.

4. COURSE MATERIALS

Required Textbook: *Partial Differential Equations: Theory and Completely Solved Problems*, by T. Hillen, I. E. Leonard, & H. van Roessel, Wiley: Hoboken, NJ (2012).

5. METHODS OF EVALUATION

On-line Assessments	via owl.uwo.ca, 5 @ 1% ea.	5 %
In-Class Quiz 1	Wed, Sept 28	10 %
Mid-Term Exam	Fri, Oct 21 (7-10PM)	25 %
In-Class Quiz 2	Mon, Nov 14	10 %
Final Exam	Dec Exam Period	50 %

Requests for academic accommodation (medical or otherwise) in AM 3815 must go through the office of the dean of your faculty. All such requests will require appropriate documentation.

Students seeking academic accommodation for medical reasons should review the university's policy on Accommodation for Illness:

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

Make-up quizzes will not be offered. Accommodation for a missed quiz will be made by increasing weight given to the next scheduled examination by the amount originally assigned to the quiz.

Make-up exams will be offered to those students who are granted accommodation. In the event that a make-up mid-term cannot be scheduled within a reasonable period of time, accommodation may be made by increasing the weight given to the final exam.

6. ADDITIONAL STATEMENTS

Use of Electronic Devices: The only electronic device you will be permitted to use during quizzes and exams is a non-programmable calculator. Any device that might store text or transmit a wireless signal is not permitted during quizzes and exams. This includes (but is not limited to) cell phones, "smart" watches, music players, computers, tablets, and programmable calculators. If you are unsure whether a device that does not appear on this list is permitted, then ask prior to a quiz or test. If you are discovered using a prohibited device during an evaluation you will be subject to academic discipline.

Academic Offences: Scholastic offences are taken seriously and 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

Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Support Services: A list of services offered by the Office of the Registrar can be found <http://www.registrar.uwo.ca>.

Counsellors 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 counselling.

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. Visit <http://westernusc.ca/services> for details.

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 Services for Students with Disabilities (SSD) at 661-2111 ext. 82147 if you have questions regarding accommodation.