# AM3815A: Partial Differential Equations I 2015–16 Course Outline

## Prerequisite Requirements

(i) Mathematics 1600A/B or the former Linear Algebra 1600A/B; Applied Mathematics 2402A or the former Differential Equations 2402A; Calculus 2303A/B or 2503A/B;  or (ii) Calculus 2402A/B and Statistics 2503A/B or the former Applied Mathematics 2503A/B.  In each course a minimum mark of 60% is required.

Unless you have either the prerequisites 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. The prerequisites for this class are:

(i)     Mathematics 1600A/B or the former Linear Algebra 1600A/B; Applied Mathematics 2402A or the former Differential Equations 2402A; Calculus 2303A/B or 2503A/B;
        **OR**
(ii)     Calculus 2402A/B and Statistics 2503A/B or the former Applied Mathematics 2503A/B.  In each course a minimum mark of 60% is required.

## The Course

Applied Mathematics 3815a is a course about partial differential equations.    We will study linear partial differential equations.  We will explore where partial differential equations arise in other disciplines, including physics, engineering, biology and ecology,  finance, and demography.   Note that this course has no non mathematical prerequisites and all application materials explored will be self contained.   We will study how to solve linear partial differential equations.  In the process we will explore the important discipline of Fourier Analysis, which also arises in signal processing.  We will also explore Sturm Liouville differential equation boundary value problems.

We will cover Chapters 2-9 of the Hillen/Leonard/vanRoessel book; Chapters 4-8 of the Shearer and Levy book will be a good reference also.

## Lecture and Instructor Information

| Section | Time | Room | Instructor | Office | Email |
|---------|------|------|------------|--------|-------|

| 001 | MWF 1:30–2:30 pm | UCC 67 | Prof. Matt Davison | W.Sc. 266 | mdavison@uwo.ca |

If you are contacting your instructor or Teaching Assistant, please use your Western email address.

# Teaching Assistant Information

| TA | Office | Email |
|---|---|---|
| Andrew Day | MC275F | Aday46@uwo.ca |

If you are contacting your instructor or Teaching Assistant, please use your Western email address.

# Course Website

Students should check OWL (http://owl.uwo.ca) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. Students are responsible for checking OWL on a regular basis.

# Course Materials

Required:   *Partial Differential Equations, Theory and Completely Solved Problems* by T. Hillen, I.E. Leonard, and H. Van Roessell  ISBN  978-1-118-06330-9

 Suggested:   *Partial Differential Equations, and Introduction to Theory and Applications* by Michael Shearer and Rachel Levy ISBN 978-0-691-16129-7

# Evaluation

## Components

The overall course grade, out of 100, will be calculated as listed below. Listed next to the respective components are their maximum contributions toward the course grade.

| Component | Notes | Value |
|---|---|---|

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|---|---|---|
| Quizzes | Every Friday starting Sept 18 (except Oct 9 and Oct 30) | 10 |
| Term Test 1 | Monday Oct 19 7-9PM  SSC2028 | 25 |
| Term Test 2 | Monday Nov 16 7-9PM SSC2028 | 25 |
| Final Exam | Scheduled by the Registrar | 40 |

No electronic devices may be in your possession during quizzes, tests and exams except for a simple scientific calculator.

It is Faculty of Science policy that a student who chooses to write a quiz, test or exam deems themselves fit enough to do so, and the student must accept the mark obtained. Claims of medical, physical, or emotional distress after the fact will not be considered.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at this website: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.


# Missed Course Components

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 Counselling Office of your home faculty as soon as possible.

If you are a Science student, the Academic Counselling Office of the Faculty of Science is located in WSC 140, and can be contacted at 519-661-3040 or scibmsac@uwo.ca. Their website is http://www.uwo.ca/sci/undergrad/academic_counselling/index.html.

A student requiring academic accommodation due to illness must use the Student Medical Certificate (https://studentservices.uwo.ca/secure/medical_document.pdf) when visiting an off-campus medical facility.

For further information, please consult the university's medical illness policy at http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.

**Missed Quizzes:**  If you miss a quiz and have valid supportive documentation which you have supplied to Academic Counselling as per above, the missed quiz (or quizzes) will be deemed to have received an equal grade to that you earned on the quizzes you write.   In the unlikely event that you miss all the quizzes, your total quiz grade   will be deemed to be equal to that earned on the other "term" component of your grade.

**Missed Tests:**  If you miss a term test the course will be reweighted 10% Quizzes, 35% other term test,  55% final.  If you miss both term tests a makeup will be arranged for the second term test missed.

If you miss the Final Exam, please contact your faculty's Academic Counselling 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).

## *Accessibility*

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.

# Support Services

Learning-skills 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, http://westernusc.ca/services.

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