COURSE OUTLINE
MATH 346: Introduction to PDEs
SPRING 2020

Instructor

Section A02

Lecturer: Dr. Jason J. Bramburger

Research Area: Applied Math, Dynamical Systems, Bifurcation Theory.

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General Course Information

Number of Units 1.5

Pre-requisites (MATH 110 or MATH 211), and (either MATH 200 and 201 or MATH 204); or permission of the Department.

Class Meetings

- 8:30 am to 9:20 am Tuesdays, Wednesdays & Fridays. Room: Clearihue Building A307.

The first lecture will be on Tuesday Jan. 07, 2020.

Office Hours and Assistance

2:00 pm to 4:30 pm on Wednesdays in ECS 128 **or** by appointment.

Other Help The Mathematics & Statistics Assistance Centre is a large space where students can go to work, on their own or in groups, and to discuss math & stats problems. The Centre is staffed with talented Teaching Assistants who are happy to discuss primarily first and second year course material with you. Please see http://www.math.uvic.ca/~msassist/index.html for more information.

Math Club Students in Undergraduate Mathematics and Statistics (SUMS) was founded in 2014 as the reincarnation of a previous undergraduate course union that had been inactive for a few years. Please see http://www.uvic.ca/science/math-statistics/current-students/undergraduate/sums/index.php for more information.

Learning Objectives

In this course we will develop a mathematical theory about the basic Partial differential equations: wave, heat and Laplace equations. We will discuss solutions by separation of variables, study boundary value problems, and introduce orthogonal functions. We will review Fourier series and transform methods to solve PDEs.

Course Material

Textbook "Applied Partial Differential Equations " Richard Haberman, (fifth edition).

Tentative list of Specific Topics

(not necessary in a chronological order and time permits!)

- Chapter I: Heat Equation.
- Chapter II: Method of Separation of Variables.
- Chapter III: Fourier Series (Sections 1-5).
- Chapter IV: Wave Equation (Sections 1-4).
- Chapter V: Sturm-Liouville Eiggenvalue Problems (Sections 1-8).
- Chapter VI: Finite Difference Numerical Methods (1, 2, 3.1 - 3.3, 3.9).
- Chapter VIII: Nonhomogeneous Problems (Sections 1-3).
- Chapter X: Infinite Domain Problems (1-2, 6.1-6.4).
- Chapter XIII: Laplace Transform (Sections 1, 2, 4, 5).

Evaluation and Grading

There are two in-class midterm tests and a final exam. There are five written homework assignments. You need to use a calculator in MATH 346. In any course offered by the Department, the only acceptable calculators are the Sharp EL-510R or the Sharp EL-510RNB. Your final percentage grade will be computed according to the following scheme.

Homework Assignments	Midterms	Final Exam
20%	30%	50%

Accessibility Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the Centre for Accessible Learning (CAL) as soon as possible. The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations `http://uvic.ca/cal`. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

Grading Percentage scores will be converted to letter grades according to the university-wide standard table that you can find online or clicking here.

Final Examination The 3-hour comprehensive final examination will be scheduled by Records to occur during the final examination period. Off-schedule final examinations (i.e., deferred examinations) are given only in accordance with the university policy as outlined in the Calendar. If you are unable to write a final examination due to illness, accident or family affliction, please look for the online detailed instructions on how to proceed or click here.

Students are **strongly advised not to make plans for travel or employment during the final examination period** as special arrangements will not be made for examinations that conflict with such plans.

Supplemental Examinations. The Department of Mathematics and Statistics does not award 'E' grades or offer Supplemental Examinations in any of its courses.

Policies and Ethics

Attendance The university Calendar states (see online or click here) 'Students are expected to attend all classes in which they are enrolled.'

Our courses are conducted on that basis. If you miss an announcement (information concerning midterms, corrections to assignment, etc.) because you did not attend class, you must accept the consequences of not having learned of the change.

Guidelines on Religious Observances Where classes or examinations are scheduled on the holy days of a religion, students may notify their instructors, at least two weeks in advance, of their intention to observe the holy day(s) by absenting themselves from classes or examinations. Instructors will provide reasonable opportunities for such students to make up work or missed examinations.

Missing work *Missing midterms* : No midterm extensions or make-ups will be offered. If you are unable to write a midterm due to serious illness, accident, or family affliction then you must provide adequate documentation as soon as possible. If you miss midterm 1 the percentage will be transferred to midterm 2. If you miss midterm 2 your final exam will count for 60% and midterm 1 will count for 20%. If you miss two midterms due to documented need, you will need to meet with your instructor to discuss your options: passing the final exam is likely to be challenging for students who have missed that much material. You may be advised to contact Undergraduate Advising to find out whether it is possible for you to get withdrawn from the course.
Missing homework : No homework make-ups will be offered.
Re-mark requests : If you believe that a midterm or a homework assignment was been incorrectly marked, you must write a short explanation (one or two sentences usually suffice) and staple it to the front of your work. This request must be submitted to your course instructor in lecture no later than the Thursday of the week after the work is returned to you.

Final exam : Deferred exams are an academic concession available to students who, through no fault of their own, are prevented by circumstances from writing the final exam.

Academic Integrity Academic integrity is intellectual honesty and responsibility for academic work that you submit individual or group work. It involves commitment to the values of honesty, trust, and responsibility. It is expected that students will respect these ethical values in all activities related to learning, teaching, research, and service. Therefore, plagiarism and other acts against academic integrity are serious academic offenses.

The responsibility of the institution
Instructors and academic units have the responsibility to ensure that standards of academic honesty are met. By doing so, the institution recognizes students for their hard work and assures them that other students do not have an unfair advantage through cheating on essays, exams, and projects.

The responsibility of the student
Plagiarism sometimes occurs due to a misunderstanding regarding the rules of academic integrity, but it is the responsibility of the student to know them. If you are unsure about the standards for citations or for referencing your sources, ask your instructor. Depending on the severity of the case, penalties include a warning, a failing grade, a record on the students transcript, or a suspension.

It is your responsibility to understand the University's policy on academic integrity. You can search for the policy online or click here.

How to Succeed in This Course

Visit CourseSpaces. There is a forum set up for class discussion, which the instructor will monitor fairly regularly. Feel free to answer questions there as well as ask. If you have a question about course policies, it is almost certain to be answered in an announcement (or this course outline) - so please check before emailing!

Check your progress. Read the feedback I give you on your midterms, and compare your work (even if it is marked as correct) with the posted solutions. Keep an eye on the CourseSpaces grade book to see your current expected grade in the course.

Email the instructor. If you have not yet learned the value of being wrong, you might find it uncomfortable to ask a question publicly. You can always email the instructor instead. Due to the number of students enrolled, if you ask a question whose answer already appears in the Course Outline or in a post on CourseSpaces I will probably just send you a link.

Start preparing early. It is highly recommended to start homework at least one week before the deadline. If you can maintain a constant moderate level of work then you will not have intense weeks that are hard to keep up during. Begin reviewing for the midterms a week or two ahead of time.

Important Dates and Deadlines.   Actual dates will be announced in class and posted in courspace

06 Jan 2020	Classes start
16 Jan 2020	**Homework 1** deadline
30 Jan 2020	**Homework 2** deadline
5 Feb 2020	**Midterm 1**
17-21 Feb 2020	Reading break
24 Feb 2020	**Homework 3** deadline
29 Feb 2020	Last day for withdrawing
5 Mar 2020	**Homework 4** deadline
17 Mar 2020	**Midterm 2**
30 Mar 2020	**Homework 5** deadline
03 Apr 2020	Last day of classes

The date of the final examination will be announced by the university.