

THE UNIVERSITY OF WESTERN ONTARIO
AM 3615A/9576A – MATHEMATICAL BIOLOGY – FALL 2015

COURSE INFORMATION

Times: Tuesdays: 1:30 – 3:30 pm and Thursdays: 1:30-2:30 pm

Location: Social Science Centre, Room 3006 (SSC-3006)

Instructor: Qasim Ali

Postdoc Fellow, Department of Applied Mathematics

Middlesex College, Room 265 (MC-265)

qali6@uwo.ca

ext. 88786

Office Hours: TBA

Website: OWL

Textbook: *Essential Mathematical Biology*, by N. F. Britton, Springer (Required)

Reference book: *Mathematical Models in Biology*, Leah Edelstein-Keshet, 2004

Pre-reqs: Either Calc 2302, or Calc 2502; either Linear Algebra 1600, or AM 1411.

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.

COURSE SYLLABUS

The objective of this course is to provide the student with an overview of mathematical modelling approaches in population biology. The course will focus on tools used when modelling population change, particularly difference and differential equations. The graduate component of this course will require students to complete a special project.

Learning Goals:

- 1. The student will establish a strong foundational understanding of common mathematical tools, and become proficient in their application.**

You should understand and remember terminology, formulae, useful theorems, etc. encountered in lectures and readings. You should be able to explain how the basic mathematical concepts have been applied to solve problems in population biology. In

particular, this will require that you sometimes interpret the biological significance of a mathematical result.

2. The student will develop his/her ability to apply foundational understanding successfully in new situations.

Through readings and other course activities you will establish connections among concepts and topics (including topics encountered earlier in your university career). The connections you establish will allow you to tackle never-before-seen problems.

EVALUATION

A student's grade will be based on assignments and in-class tests. Undergraduate students enrolled in AM 3615A will write a final examination. Graduate students enrolled in AM 9576A will complete a research project in lieu of the final exam.

Assignments:

Each student is to complete three assignments over the course of the term (due dates will be provided with assignments).

Problem sets must ...

- be completed independently;
- provide complete solutions, including clear explanations (do not submit a bunch of equalities with a box drawn around the answer and expect full credit);
- be completed using neat handwriting, and permanent ink (undergraduates), or using LaTeX (graduate students);
- be single-sided and each problem should begin on a new page;
- be submitted in person, electronically or slid under my office door by the deadline.

NOTE that assignments submitted after midnight on the due date will be considered late. Late assignments will be penalized at a rate of 10% per day, including weekends and holidays.

In-Class Tests:

There will be three in-class tests throughout the term. These tests are 50 minutes each, and will not be cumulative. The first test will be on Tuesday **October 6th**, the second will be on Tuesday **November 10th** and the last one will be on Tuesday **December 1st**.

Final Examination:

The final examination is for undergraduate students only, and will take place during the December Exam Period. The final exam will be three-hours and will be cumulative.

Research Project:

Each graduate student will choose one published research paper (mathematical in nature and on the topic of population biology) and submit an electronic copy of that paper to the instructor. Papers must not be more than 10 journal pages in length, and must be submitted before Friday **October 11th**.

Each graduate student will write a report/summary of the article. The content of this report can be decided in consultation with the instructor. In addition, they must prepare a 30-minute presentation on the research paper he or she chose. The presentation must provide background information, motivation, outline main mathematical approaches, main conclusions, and suggest ideas for future work. Presentations will be graded on content, and clarity. Time limits will be strictly enforced.

Each graduate student will also read the papers submitted by classmates. Each student will be required to ask a classmate one sensible question and the conclusion of that classmate's presentation. Questions will count toward a participation grade.

Presentations will be held during the December Exam Period. Graduate students will be required to meet as a group during that period of time.

Summary:

	AM 3615A	AM 9576A
Assignments	3 x 10% ea. = 30%	3 x 10% ea. = 30%
In-Class Tests	3 x 10% ea. = 30%	3 x 10% ea. = 30%
Final Exam	1 x 40% = 40%	–
Research Project	–	Summary = 10% Presentation = 20% Participation = 10%

ADDENDA

Academic Accommodation Due to Illness:

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to your faculty's Dean's Office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation

has been approved and the instructor has been informed. In the event of a missed final exam, a “Recommendation of Special Examination” form must be obtained from your faculty’s Dean’s Office immediately. For further information please see:

<http://www.uwo.ca/univsec/handbook/appeals/medical.pdf>

A student requiring academic accommodation due to illness should use the Student Medical Certificate when visiting an off-campus medical facility, or request a Records Release Form (located in the Dean’s Office) for visits to Student Health Services. The form is posted at:

https://studentservices.uwo.ca/secure/medical_document.pdf

Academic Integrity:

You should familiarize yourself with University of Western Ontario’s Scholastic Offense Policy. The policy describes the university’s process for dealing with scholastic offenses, including a list of sanctions. See:

<http://www.uwo.ca/univsec/handbook/appeals/scholoff.pdf>

The Office of the Ombudsperson produces a student guide on cheating, plagiarism and other scholastic offenses. See:

<http://www.uwo.ca/ombuds/student/cheating.html>

Ideas come from the mind not from Google. I TAKE PLAGIARISM VERY SERIOUSLY and I will report any concerns I have related to plagiarism to the appropriate departmental chair.