

# MATH 3800 F - Winter 2020: Mathematical Modeling and Computational Methods

**Instructor:** Gary Peter Bazdell

**Office:** 4302C Herzberg Laboratories

**Email:** gbazdell@math.carleton.ca

**Office hours:** By email appointment.

**Feedback:** Please tell me what you think about my teaching at RateMyProfessor.com.

## References:

1. A First Course in Mathematical Modeling (5<sup>th</sup> Ed) by Giordano, Fox, and Horton.
2. Applied Numerical Methods (with Matlab) for Engineers and Scientists (4<sup>th</sup> Ed) by Chapra.

**Prerequisites:** i) MATH 1107 or MATH 1104; ii) MATH 1005 or MATH 2007; and iii) Knowledge of a computer language.

**Course Contents:** In this course, we will study Mathematical Modeling. What exactly that means will be one of the topics we discuss. We will look at discrete, continuous and random processes, difference equations and differential equations. We will also study the numerical methods that come up along the way.

**Course Description:** Design and analysis of mathematical models for problems in science. Computational methods, including function evaluation, interpolation, solution of linear equations, root finding, integration, solution of differential equations, Fourier series and Monte Carlo methods.

**Classes:** Monday and Wednesday at 8:35-9:55 AM in Loeb C164.

**Classes begin:** January 6, 2020.

**Classes end:** April 7, 2020.

**Tutorials:** Labs start on or after January 13.

**Withdrawals with fee adjustment:** January 31.

Tutorial	TA Information	Day	Time	Room
F1	Joshua Franklin joshuafranklin@cmail.carleton.ca	Friday	3:35-4:25	HP 4385
F2	Joshua Franklin joshuafranklin@cmail.carleton.ca	Wednesday	10:35-11:25	HP 4385
F3	Muhammad Salman muhammadbsalman@cmail.carleton.ca	Tuesday	1:35-2:25	HP 4385
F4	Joshua Franklin joshuafranklin@cmail.carleton.ca	Friday	1:35-2:25	HP 4385
F5	Tiancheng Zhang tianchengzhang4@cmail.carleton.ca	Friday	8:35-9:25	HP 4385
F4	Tiancheng Zhang tianchengzhang4@cmail.carleton.ca	Tuesday	6:35-7:25	HP 4385

# Evaluation Summary

## Evaluation Components

20% Assignments

30% Midterm Tests

50% Final Examination

## Assignments

There will be 4 assignments worth a total of 20%. Assignments are to be handed in at the start of class. Assignments will **NOT** be acceptable after the class ends. The due dates will be January 22<sup>nd</sup>, February 12<sup>th</sup>, March 11<sup>th</sup> and April 1<sup>st</sup>. The cover page found on cuLearn must be completed and attached to the front of your assignment (**failure to do so will result in your assignment not being marked**).

## Midterm Tests

There will be two 80-minute midterm tests worth 15% each. The tests will be held in the lecture periods on Wednesday, February 5<sup>th</sup> and Wednesday, March 18<sup>th</sup>. If you miss a test, its weight will transfer to the final exam automatically.

**It is the student's responsibility to pick up their tests during the following tutorial session. Any discrepancy between the tests and cuLearn will be dealt with up to two weeks after the test date. After that point, the mark is final.**

## Final Examination

This is a 3-hour exam scheduled by the University. The exam is taking place during the period of April 13 to 25 (including Saturday and Sundays). It is each student's responsibility to be available at the time of the examination. In particular, no travel plans should be made until the examination schedule is published on February 14<sup>th</sup>. It is each student responsibility to find out the correct date and time of the exam and the room where it takes place. After the exam is written, the students are allowed to see their exam papers up until three weeks after the exam date. This examination review is for the educational purpose only and NOT for negotiation of the grade with the instructor. Please remember that we do not change grades on the basis of students' needs (such as scholarships, etc.).

## To Pass This Course

A student must obtain at least 50% of total and at least 30% of the final exam mark. Students who missed the examination may be eligible for a deferred exam, provided that they present an official signed medical note or another supporting document to the Registrar's Office. It is the Registrar's Office which makes the decision of granting a deferred examination.

## Learning Assistance

### Homework

Students are expected to do the exercises from the textbook that follow the sections discussed in class. These exercises are not to be handed in and will not be graded. However, in order to succeed in the course, it is absolutely essential to do the exercises on a regular basis.

### Calculators

You will need a basic scientific calculator for the tests and final exams. If you have a graphing and/or programmable calculator, you may find it useful for the assignments, but you will not be permitted to use it on the exams.

# University Policies

## Student Academic Responsibilities

Each student is responsible for:

- Knowing the due dates of in-tutorial marked problem sets and tests.
- Maintaining a folder of all work done in the course during the semester for validation claims in cases of disagreement with faculty.
- Keeping both paper and electronic copies of all assignments, marked and unmarked, in case papers are lost or go missing.
- Regularly checking both cuLearn announcements as well as one's Carleton e-mail account for important messages from both professor and university administration
- Participating in tutorial exercises and activities as required.

## Class Conduct

To ensure an optimum-learning environment, students are expected to behave in a professional manner at all times. Disrupting a class is considered to be an Instructional Offence (see University Calendar). If a student exhibits disruptive behavior in class and chooses not to refrain from such behavior at the request of the instructor, the student will be asked to leave the class. The student's behavior will be reported to Campus Security and the Office of the Associate Dean of Student Affairs.

## Student Academic Integrity Policy

Every student should be familiar with the Carleton University student academic integrity policy. A student found in violation of academic integrity standards may be awarded penalties, which range from a reprimand to receiving a grade of F in the course or even being expelled from the program or University. Some examples of offences are: plagiarism and unauthorized co-operation or collaboration. Information on this policy may be found in the Undergraduate Calendar.

## Plagiarism

As defined by Senate, "plagiarism is presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own". The office of the Dean of Science will review such reported offences.

## Unauthorized Co-operation or Collaboration

Senate policy states that "to ensure fairness and equity in assessment of term work, students shall not co-operate or collaborate in the completion of an academic assignment, in whole or in part, when the instructor has indicated that the assignment is to be completed on an individual basis". Please refer to the course outline statement or the instructor concerning this issue.

## Academic Accommodations for Students with Disabilities

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or [pmc@carleton.ca](mailto:pmc@carleton.ca) for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your *Letter of Accommodation* at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website ([www.carleton.ca/pmc](http://www.carleton.ca/pmc)) for the deadline to request accommodations for the formally

scheduled exam (*if applicable*).

### **Academic Accommodation**

To be worked out on individual basis with instructor. Consult Equity Services Website or an Equity Advisor, ext. 5622, for Policy and list of Holy Days ([www.carleton.ca/equity](http://www.carleton.ca/equity)). For Pregnancy Contact Equity Services (ext. 5622) to obtain letters of accommodation

### **Student with Religious Obligations**

1. As soon as you receive your course syllabus, identify any potential conflicts between your religious obligations and course requirements.

NOTE: Contact Equity Services if you are unclear if your religious observance requires accommodation under the Policy

2. Make a formal written request to your instructor indicating the nature of the religious obligation and suggest possible alternative dates and/or means of satisfying the academic requirements.

NOTE: Such request should be made during the first two weeks of the term, or as soon as possible after a need for accommodation is known to exist, but in no case later than the second last week of classes for that term. Even if you are unclear as to the exact date of the obligation (e.g., when waiting for a moon sighting) you are still expected to notify your instructor of the potential conflict and explore accommodation options.

3. If your request for accommodation is denied you may contact Equity Services and request assistance in an informal review of the decision.

[http://www.carleton.ca/equity/accommodation/student\\_guide.htm](http://www.carleton.ca/equity/accommodation/student_guide.htm)

### **Medical Certificate**

The following is a link to the official medical certificate accepted by Carleton University for the deferral of final examinations or assignments in undergraduate courses. To access the form, please go to <http://www.carleton.ca/registrar/forms>.