MAT 1330E: Calculus for the Life Sciences I, Fall 2021

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Course description: Discrete dynamical systems (DTDS): equilibrium points, stability, cobwebbing. Derivatives: product and quotient rules, chain rule, derivative of exponential, logarithm and basic trigonometric functions, higher derivatives, curve sketching. Applications of the derivative to life sciences. Integrals: indefinite and definite integrals, fundamental theorem of calculus, antiderivatives, substitution, integration by parts. Applications of the integral to life sciences.

Central hub: All links to classes, DGDs and office hours, as well as files, resources, homework, quizzes, announcements and the calendar of activities, will appear on our Brightspace homepage: `https://tlss.uottawa.ca/site/index.php?option=com_content&view=article&id=1391&Itemid=4814&lang=en`

Technical requirements: You must have a reliable internet connection, a computer equipped with standard applications (including a browser such as Google Chrome or Firefox, as Safari is not well-supported), a microphone, and a cellphone equipped with an app such as CamScanner (or an actual scan-ner). In addition: you must have an external camera (such as a cell phone, plugged in) that can be positioned during a test or exam to show your work surface, your face and your computer screen.

How to succeed in Calculus

Get ready for term: You have been enrolled in a Custom Course on Brightspace, separate from MAT1330, called **Calculus Readiness Module: Self-Testing and Lots of Tips**. Take quizzes, read the Survival Guide, and warm up your mathematical mind before the term starts!

Attend Lectures: Mondays 10:00–11:30 am and Wednesdays 8:30–10:00 am online using Zoom, using the link corresponding to the lecture in Brightspace. You can enter the room early. Lectures will be recorded and uploaded to Brightspace as soon as possible for anyone who can't attend, or who has connection issues.

Class: We'll be adapting as we go along. For our first class, half the time will be devoted to course logistics and answering your questions; the rest will be more fun (math). The review part of the course is the first week (two lectures and all DGDs); thereafter, we'll be covering new material and will settle into more of a routine. I will be happy for your feedback throughout; we will make this work well!

Zoom etiquette for class: mute your microphone to avoid echoes. Please ensure your name appears appropriately (eg Ali M or Sara B, not jz9w or BlackWidow). Post questions in the chat during the lecture, which I answer live. You can ask questions live before and after the class time. If I didn't get to your question during class time, please post it on the Discussion board on Brightspace.

Prepare & Self-Evaluate: Prepare for class by reviewing the material of the previous class and reading the notes. After class, start on the week's homework assignment, which includes some quick questions to check your comprehension, in addition to longer answers where you practice your problem-solving skills.

Attend DGDs: This is your Directed Group Discussion, led by a graduate student TA, who will answer questions and work through the suggested exercises for the preceding two lectures. You are free to attend whichever suits your schedule (see links on Brightspace):

DGD E1:	Friday 8:30 – 9:50 am	First regular DGD: September 17
DGD E2:	Wednesday 10:00 – 11:20 am	First regular DGD: September 15
DGD E3:	Wednesday 1:00 – 2:20 pm	First regular DGD: September 15

On September 8, during the DGD time slot, 10:00-11:20 am, and September 13, 5:30-6:50 pm, I will cover pre-Calculus review, following a schedule posted on Brightspace.

Use Möbius: Your assessments are to be completed online using a web application called Möbius. You will need to purchase a license for Möbius the first time you use it; see the instructions on Brightspace. Check out the Möbius FAQ. Available August 20.

Start the homework early each week and use the instant feedback as a tool to measure your learning. Note that you can redo the assignment to increase your grade, up to the due date (which is immoveable).

Get mathematically fit: Do 5 problems every day : from Möbius, from the Course Guide and DGD Workbook, from the textbook. **You must do problems to actually learn Calculus** — reading the notes and understanding the theory is necessary but insufficient. Work regularly throughout the term.

Textbook: The official textbook for the course is *Calculus for the Life Sciences: Modelling the Dynamics of Life* by Frederick Adler and Miroslav Lovric. There are two editions of this textbook, some available used. Either of them will work for this course; the newest has geese on the cover. The book has all the material for the course, and also tons of problems, with answers at the back. The book is an excellent tool you can use to keep up with the course and continually evaluate the progress of your learning.

Ask questions: Don't be shy to ask a question during the lecture. Plus, I am always available for questions before and after lecture: I aim to have the classroom open 30 minutes ahead. You can also email me and ask your questions.

Quick email etiquette: Subject line: MAT1330 + something informative. Body of email: Dear (professor or, once we've met, Nazanin), (content), Yours, (Name), (Student number).

Come to office hours: Ask anything. Wednesdays 4:00-5:30 pm via Zoom. I can also see you outside of these hours, but you have to send an email to book your appointment beforehand. Links will be posted on Brightspace.

Lecture Notes: These notes are supplemented with extra background material and examples. The sections associated to each class are indicated on Brightspace. See also the helpful index.

Course Guide: For each lecture : a one-page summary of the main ideas, together with questions from exams and homework of previous years.

DGD Workbook: Some of the recommended exercises, with exam-style space for your answer. Most weeks, you will do a subset of these problems in the DGD.

Check Brightspace: This is the central hub of our communications, with a guide for each lecture designed to help you keep on top of everything. Announcements will be posted there. Solutions to assessments

and your interim grades will also appear here; be sure to verify their accuracy.

How you will evaluate your progress

Weekly assignments: There will be weekly assignments. Some questions are Comprehension checks: quick assessments to help you see if you understood the theory of the lecture. The rest are focussed on developing your problem-solving skills. Do the work on paper so that you have a record of your reasoning that you can compare with the detailed solutions. The purpose of these assignments is to help you learn the material and receive immediate feedback, and are a supplement to Course Guide and DGD exercises. Start early: you can redo assignments up to the due date to increase your grade.

Academic integrity and how to learn math: you may work on assignments with friends or study groups; be sure that in the end you complete the question yourself, ideally, a little while later with your book closed (to see what you can pull out of your mind!). If you use a tutor, they should NOT provide the answer to you, but only guide you in how to choose the next steps. You may check your answer using internet tools, but if it tells you a different answer, you really have to do the steps yourself to understand how they got there, or else it's just cheating.

Tests:

Review Test: Wednesday September 22, 2021, 40 minutes, replacing the lecture. Covers high school material (see Course Guide and Lecture Notes for scope — not all will have been covered in class).

Test 1: Wednesday, October 13, 2021, 70 minutes, replacing the lecture. Covers t he first 8 lectures.

Test 2: Wednesday, November 17, 2021, 70 minutes, replacing the lecture. Covers material of lectures 8 through 14.

Final: During the final exam period (December 9 to 22, 2021; exact date published on October 8). 3 hours, half on Lectures 16 to 21, half is a comprehensive evaluation of the course.

If you miss a test for a valid reason, you must inform the professor by email immediately, with justification, and the weight of that test will be distributed to the other tests at the discretion of the professor. There are no make-up tests. Statistics show that students who write all tests do better on the final than those who missed a test.

Final exams are run by the Faculty of Science; see their policies and procedures for missing an exam: `https://science.uottawa.ca/en/students-etudiants/exams`.

Test procedures: Tests in this course will be closed-book and invigilated (proctored); doing so allows us to set normal tests and exams that are similar in spirit to previous years — straightforward assessments of your mathematical competencies in this course.

The precise modalities will be announced on Brightspace and depend on the proctoring tool used, which will be some subset of the following: **Zoom, Respondus Lockdown and Monitor, Möbius Test Environment, or Test Centres**.

You will need to upload your written work at the end of each test. Uploading after the deadline, or failure to adhere to the rules announced for the test, is subject to penalties that increase with tardiness to a maximum of 100% of the work.

Early in the course, you will do set-up activities to acquaint you with the Test environment and to practice scan-and-upload.

Any questions concerning the marking must be submitted to the professor within 5 working days of the release of the graded tests.

Academic integrity expectation for tests and the exam: The exams are closed-book, and are intended to evaluate students' learning. To this end, you are not permitted to

access internet resources, or to communicate with other students in any way, during the test. You must follow the instructions of the proctor. You are not permitted to share or distribute test questions or answers **at any point**, during or after your test. For each test, specific instructions will be given about formula sheets (if any) and other aids such as calculators.

Calculators: The Faculty-approved calculators are **Texas Instruments TI-30 and TI-34, Casio FX-260 and Casio FX-300**. These are inexpensive scientific and non-programmable, non-graphing calculators approved for use in science courses. In Fall 2021, any inexpensive scientific and non-programmable, non-graphing calculator is acceptable.

Final grade: Your final grade will be calculated as follows:

2%: Timely completion of various set-up activities — These will be announced in Brightspace and in class.
13%: Weekly assignments on Möbius.
5%: Review Test
20%: Test 1
20%: Test 2
40%: Final exam

Look for announcements towards the end of term on the precise way the total grade for the weekly assignments will be calculated.

Additional resources

Math Help Centre: The *Mathematics Help Centre* http://science.uottawa.ca/en/faculty-services/undergraduate-studies#MAT is staffed by teams of friendly graduate students who will answer your questions.

- Book an appointment and bring your work.
- Don't ask homework questions (those are for you) — choose similar questions from the Course Guide, textbook or DGD exercises instead.
- For Möbius questions, contact your professor, not the Help Centre.

For more information, see Resources on our Brightspace.

Study groups: Several residences and student groups offer study groups for MAT1330. Working with others, explaining your answers and talking about approaches can help you learn.

Need more?: The course MAT1327 is run in parallel with MAT1330 but at 3 lectures per week for a calmer pace and more high school review. It is equivalent to MAT1330 in your program. You can change your registration to MAT1327 until September 21; your Möbius licence will carry over.

Accessibility: The University provides academic accommodations for students with disabilities in accordance with the terms of the Ontario Human Rights Code. This occurs through a collaborative process that acknowledges a collective obligation to develop an accessible learning environment that both meets the needs of students and preserves the essential academic requirements of the University's courses and programs. The University of Ottawa is committed to ensure that persons with disabilities have equal access to its services and events. If you are in need of accommodation during this course due to a disability, please consult with Academic Accommodations Services as soon as possible: `https://sass.uottawa.ca/en/access`.

Health and Wellness: The University of Ottawa provides a full range of services at `https://uOttawa.ca/wellness`. Take the time to browse the website: you may be able to help a friend in need.

Academic GPS: A one-stop shop for mentoring, study groups and more: `https://uOttawa.saea-tlss.ca/en/academic-gps`

Academic regulations

Prerequisites: Completion of MAT1339 or Ontario 4U Calculus and Vectors (MCV4U), or an equivalent, with a passing grade is required for registration in this course. The courses MAT1330, MAT1300, MAT1308, MAT1320 cannot be combined for credit. If you are considering changing programs, please speak with your professor or your academic advisor about your options.

Academic fraud: Please consult the University regulations on academic fraud § 14: https://www.uottawa.ca/administration-and-governance/policies-and-regulations.

There is no excuse for fraud; in particular, ignorance is not an excuse.

You are encouraged to work with friends on homework assignments: explaining solutions to others, and seeing how others solve problems is a valuable learning tool.

You must work individually on tests and exams. In particular this means you are not permitted to access internet resources, use communication devices, consult your course notes or collaborate with friends or tutors on tests.

The penalties for academic fraud at the university level are severe. Do not jeopardize your future with an unethical start.

Due diligence: I reserve the right to meet with you (virtually) to obtain clarification about any answers you submitted for a test. If you decline such a request I will not assign a grade.

Statement on prevention of sexual violence: The University of Ottawa does not tolerate any form of sexual violence. Sexual violence refers to any act of a sexual nature committed without consent, such as rape, sexual harassment, or online harassment. The University, as well as student and employee associations, offers a full range of resources and services allowing members of our community to receive information and confidential assistance and providing for a procedure to report an incident or make a complaint. For more information, visit: http://www.uottawa.ca/sexual-violence-support-and-prevention

Sessional dates:

Term dates:	September 8 to December 8, 2021
Reading week:	October 24 to 30, 2021
Add date:	September 21, 2021. Last day to make changes to your course selection.
Drop date:	November 19, 2021. Last day to withdraw from a course and thus avoid receiving a final grade on your transcript.
October 11:	Thanksgiving. No classes.
December 8:	This Wednesday will follow a Monday schedule.

Last updated: August 27, 2021