



MATH 1215

Calculus for the Life Sciences

Winter 2020

Instructor: Asmita Sodhi (acsodhi@dal.ca)
Office: Chase 326
Lectures: MW 1:05pm-2:25pm, Computer Science 127
Tutorials: T01: Friday 12:35-1:25pm, Dunn 304
T02: Thursday 4:35-5:25pm, LSC Common C332
Office Hours: Tuesday 1-3pm, Wednesday 3-4pm, Thursday 10:30-11:30am
in the Math Learning Centre (Chase 119), or by appointment
Website: Brightspace

Course Description/Objectives:

MATH 1215 is designed to provide the basic mathematical tools required for the life and social sciences. All of the main topics from differential and integral calculus will be covered (including derivatives, techniques of differentiation, logarithmic and exponential functions, optimization, basic ordinary differential equations, integration, and techniques and applications of integration) and have an emphasis on modelling systems from the life and social sciences.

Prerequisite: Nova Scotia Mathematics 11 and 12 or pre-calculus is highly recommended.

Textbook:

Calculus for the Life Sciences: Modelling the dynamics of life, 2nd Cnd. ed. by F. Adler and M. Lorvić.

Evaluation and Grading:

- **Homework** - Each week there will typically be two or three homework assignments found on the course webpage. The problems will be based on class content and suggested textbook problems.
- **Group Projects** - There will be two projects during the semester where you will have the opportunity to work out an application of the theory in this course to a real-life situation. You will have two weeks to complete each project. You will work on the projects in groups of 2 or 3.
- **Midterm Test** - The midterm test will be held on Monday, March 2, from 1:05-2:25pm (in class).
- **Final Exam** - The final exam will be 3 hours long. The date and time for this exam is set by the registrar during the official Dalhousie exam period from April 8-24, 2020, and will be available when the exam schedule is posted on February 4. If you plan to depart from campus at the end of the semester, please buy your airline tickets after the registrar has announced the exam schedule, or plan to leave after April 24. There will not be any opportunities to write the exam early.

Your grade in the course will be the maximum of the following four marking schemes:

	Homework	Projects	Midterm Exam	Final Exam
Scheme 1	15%	20%	25%	40%
Scheme 2	10%	20%	25%	45%
Scheme 3	15%	15%	25%	45%
Scheme 4	15%	20%	20%	45%

Important Dates:

January 15	Project 1 is available
January 29	Project 1 is due
January 31	Last day to drop winter term courses without a “W”
March 2	Midterm Test
March 9	Last day to drop winter term classes with a “W”
March 11	Project 2 is available
March 25	Project 2 is due
April 8-24	Final exam period

Course Topics and Approximate Dates:

week 1	Discrete dynamical systems - §3.1-3.4
week 2	Rates of change, Limits, Exponential Functions - §4.1-4.3, 2.2
week 3	Continuity, Differentiation, Logarithmic Functions - §4.4-4.5, 5.1, 2.2
week 4	More derivatives, Implicit derivatives, Trig. Functions - §5.2-5.3, 5.5, 2.3
week 5	Trig. derivatives, Related Rates, Second derivatives, Linear Approximation - §5.4, 5.5, 5.6, 5.7
week 6	Max/Min, Midterm Exam Review, Graphing - §6.1, 6.5
week 7	l'Hôpital's rule, Taylor Polynomials - §6.4, 5.7
week 8	Equilibria & derivatives, Logistic Equation, Differential equations - §6.7, 6.8, 7.1
week 9	Euler's Method, Antiderivatives, Definite Integrals, Riemann Sums - §7.1-7.4
week 10	FTOC, Substitution, Autonomous Differential Equations - §7.3-7.5, 8.1-8.3
week 11	Integration by Parts, Separable Differential Equations - §7.5, 8.4
week 12	Integration by Taylor Polynomials, Final Exam Review - §7.5, 8.4

Letter Grade Distribution:

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale.

A+	(90-100)	B+	(77-79)	C+	(65-69)	D	(50-54)
A	(85-89)	B	(73-76)	C	(60-64)	F	(< 50)
A-	(80-84)	B-	(70-72)	C-	(55-59)		

Course Policies:

- All homework assignments are to be completed on WeBWorK (via Brightspace). There will be no extension of homework.
- This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates and the instructor. Rather than emailing questions to the instructor or TA, you are encouraged to post your questions on Piazza. You can find our class page at <https://piazza.com/dal.ca/winter2020/math1215/home> (also linked on Brightspace).
- Textbooks, course notes, and calculators are not permitted on midterm or final exams. You will be permitted one 8.5"×11" study aid for each exam.
- Students can get help with this course in the Math Learning Centre, which is located in Chase 119 (first floor of the Chase Building). The Math Learning Centre is open from 12-5pm every weekday.
- In the event that you are absent for three days or fewer resulting in missed or late academic requirements, you will be required to submit a Student Declaration of Absence Form to your instructor, see: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/academic-policies/student-absence.html

University Policies and Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

Information: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

Information: https://www.dal.ca/campus_life/academic-support/accessibility.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner - perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

Code: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Diversity and Inclusion - Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness.

Statement: <http://www.dal.ca/cultureofrespect.html>

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) (elders@dal.ca).

Information: https://www.dal.ca/campus_life/communities/indigenous.html

Important Dates in the Academic Year (including add/drop dates)

https://www.dal.ca/academics/important_dates.html

University Grading Practices

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

Missed or Late Academic Requirements due to Student Absence (policy)

https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html

Student Resources and Support

Advising

- General Advising: https://www.dal.ca/campus_life/academic-support/advising.html
- Science Program Advisors: <https://www.dal.ca/faculty/science/current-students/academic-advising.html>
- Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html
- Black Students Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html
- International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic Supports

- Library: <https://libraries.dal.ca/>
- Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html
- Studying for Success: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html
- Copyright Office: <https://libraries.dal.ca/services/copyright-office.html>
- Fair Dealing Guidelines: <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

Other Supports and Services

- Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html
- Student Advocacy: <https://dsu.ca/dsas>
- Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Safety

- Biosafety: <https://www.dal.ca/dept/safety/programs-services/biosafety.html>
- Chemical Safety: <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>
- Radiation Safety: <https://www.dal.ca/dept/safety/programs-services/radiation-safety.html>
- Scent-Free Program: <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>