

# MATH 1215 - Calculus for the Life and Social Sciences

## 1 General Information

**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. **This course is taught in four 50 minute classes per week.**

**Prerequisites:** 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.

**Calculators:** Calculators are not permitted during the midterm and final exam. Answers may be left unsimplified.

## 2 Instructors

### Section 1

**Instructor** Todd Mullen

**Times** MWF 08:35 – 09:25 +  
T01, 02, 03, or 04

**Location** ROWE MANAG 1028 +  
see T01-04 locations

**Email** todd.mullen@dal.ca

**Office** Chase 312

### Section 2

**Instructor** Dr. Sarah Chisholm

**Times** MWF 10:35 – 11:25 +  
T01, 02, 03, or 04

**Location** CHEMISTRY 125 +  
see T01-04 locations

**Email** sachisho@dal.ca

**Office** Chase 122

### Section 3

**Instructor** Dr. Sarah Chisholm

**Times** MWF 09:35 – 10:25 +  
T 16:35 – 17:25

**Locations** H. HICKS 212 (MWF) +  
ROWE MANAG 1014 (T)

**Email** sachisho@dal.ca

**Office** Chase 122

## 3 MATH Self-Assessment

All students should take the Mathematics Self-Assessment prior to the start of the semester. If you have not yet done so, please complete the assessment as soon as possible. <https://www.dal.ca/faculty/science/math-stats/programs/undergraduate-studies/first-year-math.html> If your score is below 50% you will be encouraged to register in MATH 1215 L03, a smaller class reserved for students with less background preparation.

## 4 Evaluation and Grading

**Homework** Each week there will typically be two to 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 Friday, October 18, from 6:30-8:30pm. Location TBA.

**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 December 5 until December 15, 2019. 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 December 15. There will not be any opportunities to write the exam early.

**Course score:** The maximum of the following possible combinations –

- Homework 15% + Projects 20% + Midterm Test 25% + Final Exam 40%
- Homework 10% + Projects 20% + Midterm Test 25% + Final Exam 45%
- Homework 15% + Projects 15% + Midterm Test 25% + Final Exam 45%
- Homework 15% + Projects 20% + Midterm Test 20% + Final Exam 45%

The grading scheme for this course will follow the standard scale set by Dalhousie University.

## 5 Important Dates

**September 16** Project 1 is available

**September 30** Project 1 is due

**October 18** Midterm Test

**November 1** Project 2 is available

**November 22** Project 2 is due

**December 5-15** Exam period

## 6 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** FTC, 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

## 7 Student Accommodations

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic under the Nova Scotia Human Rights Act. Students who require academic accommodation for either classroom participation or the writing of tests, quizzes and exams should make their request to the Office of Student Accessibility & Accommodation (OSAA) prior to or at the outset of each academic term. Please visit [https://www.dal.ca/campus\\_life/academic-support/accessibility.html](https://www.dal.ca/campus_life/academic-support/accessibility.html) for more information and to obtain Form A - Request for Accommodation. A note taker may be required to assist a classmate. There is an honorarium provided for the note taker of \$75-100/course/term. If you are interested, please contact OSAA at 494-2836 for more information.

## 8 Final Notes

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](https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/academic-policies/student-absence.html)

The university policy states that all cases of academic misconduct must be handled through official channels. The instructional staff has no latitude in this matter. Please read the paragraphs on academic honesty on page 66-69 in the Calendar.

[https://cdn.dal.ca/content/dam/dalhousie/pdf/academics/academiccalendar/Undergraduate\\_2018-2019.pdf](https://cdn.dal.ca/content/dam/dalhousie/pdf/academics/academiccalendar/Undergraduate_2018-2019.pdf)

Transitions are challenging. Students moving from high school to university experience high levels of stress especially in terms of their studies. The Writing Centre, works to develop writing skills that meet university expectations in one-on-one sessions, in small groups, and in classes. Please visit

[https://www.dal.ca/campus\\_life/academic-support/writing-and-study-skills.html](https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html)

Tutoring information and academic skills program information may be found at

[https://www.dal.ca/campus\\_life/academic-support/study-skills-and-tutoring.html](https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html)