

Faculty of Science Course Syllabus
Department of Mathematics
MATH 1000
Differential & Integral Calculus I
Winter, 2025

Dalhousie University acknowledges that we are in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People and pays respect to the Indigenous knowledge held by the Mikmaq People and to the wisdom of their elders, past and present. The Mikmaq People signed Peace and Friendship Treaties with the Crown, and section 35 of the Constitution Act, 1982 recognizes and affirms Aboriginal and Treat rights. We are all Treaty people.

Dalhousie University also acknowledges the history, contributions and legacies of the African Nova Scotians, who have been here for over 400 years.

Instructor: Obaidah Afghani: oafghani@dal.ca

Teaching Assistant: Titilayo Agboola: tt867148@dal.ca

Time: January 06 - April 07

Lectures:

MWF 11:35-12:25 AM

Studley CHEMISTRY 125

Tutorials: (To begin the week of January 13)

T01: Monday 16:35-17:25 AM Studley-LSC-COMMON AREA C208

T02: Monday 13:35-14:25 AM Studley-LSC-COMMON AREA C332

T03: Monday 10:35-11:25 AM Studley-SIR JAMES DUNN BUILDING 304

Office Hours:

MW 10:00-11:00 AM 125 Chase Building

F 1:00-2:00 PM 125 Chase Building

Course Description

This course offers a self-contained introduction to differential and integral calculus. The topics include functions, limits, differentiation of polynomial, trigonometric, exponential and logarithmic functions, product, quotient and chain rules, applications of differentiation, antiderivatives and definite integrals, integration by substitution. A sequel to this course is MATH 1010.03

Course Prerequisites Nova Scotia Mathematics advanced 11 and 12 or pre-calculus. Pre-calculus is highly recommended.

Course Exclusions MATH 1215.03, MATH 1280.03, MATH 1500X/Y.06

Course Objectives/Learning Outcomes

- Working with and demonstrating an understanding of the concepts of limits, continuity, differentiability and integrability of functions.
- Using and applying the Intermediate Value Theorem as well as the Mean Value Theorem / Rolle's Theorem to solve problems.
- Being able to identify the graph of a given function, using calculus.
- Being able to use calculus to solve optimization and related rates problems.
- Computing derivatives as well as basic integrals.
- Understanding the connection between differentiation and integration given by the Fundamental Theorem of Calculus and using it to solve problems.

Course Materials

- Course Notes (By Dr. Rob Noble): A summary of the second supplementary textbook sections, these notes are available under **Content** on Brightspace,
- Supplementary Textbook-1: <https://openstax.org/details/books/calculus-volume-1>. Volume 2 of this book will also be used in MATH1010.
- Supplementary Textbook-2: Single Variable Calculus - Early Transcendentals, (any edition), by James Stewart, Daniel K. Clegg and Saleem Watson.
- Website: MATH 1000 Brightspace webpage.
- Webwork: Used for online assignments and accessed through Brightspace.

Student Resources

- The MATH/STAT Learning Centre is located in Chase 119 and will be operating in-person and remotely. It opens on Jan. 6 and support is available Monday through Friday from 11:30am - 4:30pm and Monday through Friday evenings from 6:30- 7:30pm, until Apr. 26. Register for the Brightspace "course" at <https://www.dal.ca/faculty/science/math-stats/about/learning-centre.html> to access the online support and see the latest schedule.

Course Assessment: Your final grade will be computed as the maximum from the following two schemes. You are encouraged to plan for Scheme I, Scheme II is only in case you did not perform up to your ability in the midterm due to circumstances out of your control.

Scheme I:

Component	Weight (% of final grade)	Date
Online Assignments	20 %	~ 3 per week.
Tutorial Quizzes	5%	weekly
Midterm	25%	TBD
Final Exam	50%	Scheduled during the exam period

Scheme II:

Component	Weight (% of final grade)	Date
Online Assignments	20 %	~ 3 per week.
Tutorial Quizzes	5%	weekly
Final Exam	75%	Scheduled during the exam period

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)		

Timeline for Course Content and Delivery

The following table gives a tentative teaching schedule for chapters 2-5 of Dr. Noble's course notes. The plan is to cover approximately one section each class.

Date	Content
January 6 - 10	Tangents, Velocity, Limits,(2.1 & 2.2)
January 13 - 17	Limit Laws, Continuity, Limits at Infinity (2.3, 2.5 & 2.6)
January 20 - 24	The Derivative, Differentiation Rules (2.7, 2.8 & 3.1)
January 27 - 31	(3.2, 3.3, 3.4) Differentiation Rules Cont'd
February 3	Last Day to Drop without a "W"
February 3 - 5	Implicit Differentiation, Logarithmic Differentiation (3.5, 3.6)
February 07	Munro Day (No Classes)
February 10- 14	Rates of Change in Science, Exponential Model, Related Rates (3.7, 3.8, 3.9)
February 17- 21	Study Week (No Classes)
February 24- 28	Linear Approximation, Max /Min Problems (3.10, 4.1)
February 28	Tentative Midterm: (6:30-8:30 pm)
March 3 -7	Mean Value Theorem, Graphing (4.2, 4.3)
March 4	Last Day to Drop with a "W"
March 10 -14	L'Hospital's Rule, Optimization (4.4, 4.5, 4.7)
March 17 -21	Antiderivatives, Area Under a Curve, Definite Integrals(4.9, 5.1, 5.2)
March 24 -28	Fundamental Theorem of Calculus (5.2, 5.3)
March 31 -April 4	Indefinite Integrals , The Substitution Rule (5.4, 5.5)
April 7	Final Exam Review

**Note that on Monday April 7, Friday classes will be held.*

Course Policies

1. On exams, it is recommended that answered be left in un-simplified form.
2. Calculators will NOT be allowed during tutorial quizzes, the midterm or the final exam. Students are only allowed to have writing utensil (pencils, lead, erasers, pens or white-outs).
3. Information about the course may be given during class. It is the responsibility of the students to ensure that they are aware of what occurs during classes.
4. Students are strongly encouraged to attend classes. Lectures will help give you a deeper understanding of the concepts, make connections and build/strengthen necessary algebraic skills.
5. Missed midterms or final exams can be made up, at the discretion of the course instructor for illness or equivalent official inability to write at the scheduled time and place. Please contact your instructor for more information or to request permission to write the scheduled make-up midterm or final exam.
6. Students are allowed to discuss and work together on online assignments.
7. Missed tutorial quizzes cannot be made up under any circumstances. However, [Student Declaration of Absence](#) forms (maximum of 2) will be accepted for tutorial quizzes. SDAs should be completed, signed and emailed to the instructor within 3 days of the missed tutorial.

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

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>



Dalhousie COVID-19 information and updates: <https://www.dal.ca/covid-19-information-and-updates.html>