

Faculty of Science Course Syllabus

Department of Mathematics and Statistics

Math 1000

Differential & Integral Calculus I

Winter 2021

Instructor

Instructor	E-mail Address	Office Hours Information
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Lectures

Asynchronous: Beamer (PowerPoint like) presentations will be posted on BrightSpace three times per week, once on each of Monday, Wednesday and Friday, and will be designed to break down the material from the course notes into “lecture-sized” pieces. In addition, some recorded problem solving sessions will be posted, as review for quizzes and exams.

Synchronous: There will be one synchronous lecture per week (Mondays 8:35 AM – 9:25 AM, accessible via BrightSpace under Content>Lectures/Office Hours>Collaborate Ultra). Attendance is optional. It will be recorded to allow for later access.

Tutorials

Asynchronous: Teaching assistants will be holding office hours (accessible via BrightSpace under Content>Lectures/Office Hours>Collaborate Ultra, dates/times TBD), and will be available for questions on BrightSpace discussion boards.

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.

Learning Objectives

- Understand the significance of limits, continuity, differentiability and integrability of functions.
- Understand the connection between differentiation and integration given by the Fundamental Theorem of Calculus.
- Understand the significance of the Intermediate Value Theorem as well as the Mean Value Theorem / Rolle’s Theorem.
- Be able to use calculus to solve optimization problems.
- Be able to compute derivatives as well as basic integrals.

Course Materials

- The complete set of course notes will be available at the start of the course under **Content** on BrightSpace.
- Textbook: Single Variable Calculus, Ninth Edition, by James Stewart. This textbook will also be used in Math 1010. Earlier editions of the text will be sufficient, as the main source of content will be the (complete set of) lecture notes, as well as the presentations and recorded lectures posted on BrightSpace.
- BrightSpace: This course has a major presence on BrightSpace. To access your Math 1000 course on BrightSpace you may login to: <https://dal.brightspace.com/d21/login>. Alternatively, you can select the OWL link that appears on the Dalhousie homepage (<http://www.dal.ca>). It is important that you familiarize yourself with the systems requirement for proper access to Brightspace.

You will need at various times to gain information from different areas of Brightspace. Most importantly:

1. The course outline as well as links to the online assignments and quizzes will be found under **Content**.
 2. Your grades can be found under **Assessments**.
- Webwork: Your online assignments and quizzes will appear in WebWork, accessed through links appearing under **Content** in BrightSpace.

Course Assessment

The Final Grade will be computed as follows:

Component	Weight (% of final grade)	Date
Online Quizzes (5)	50%	Jan. 27, Feb. 10, Feb. 24, Mar. 10, Mar. 24 (Each quiz will be accessible from 10:00 AM - 10:00 PM)
Final Exam	30%	(Scheduled by Registrar)
Online Assignments	20%	~3 per week

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

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

Course Policies

- Missed quizzes, or final exams can be made up for documented illness / inability to participate at the given time.
- Assignments will be reopened periodically throughout the term, for study purposes, and so there will be several chances to make up a missed assignment.
- Collaboration during quizzes or during the final exam **is not allowed**. These components of the course **must** be completed independently.
- Collaboration is allowed, when working on the assignments.

Course Content

The material to be covered consists of the contents of the posted course notes. Specifically, we will try to stick to the following schedule for posted presentations:

Date	Topic
January 6, 8	Tangents, Velocity, Limits (§2.1, 2.2)
January 11 – 15	Limit Laws, Continuity, Limits at Infinity (§2.3, 2.5, 2.6)
January 18 – 22	The Derivative, Differentiation Rules (§2.7, 2.8, 3.1)
January 25 – 29	Differentiation Rules (cont'd) (§3.2, 3.3, 3.4)
February 1, 3	Implicit Differentiation, Derivatives of Logarithmic Functions, Logarithmic Differentiation (§3.5, 3.6)
February 5	Munro Day. University Closed
February 8 – 12	Rates of Change in Science, Exponential Growth and Decay (§3.7, 3.8)
February 15 – 19	Winter Study Break
February 22 – 26	Max/Min Problems, Mean Value Theorem, (§4.1, 4.2)
March 1 – 5	Graphing, L'Hospital's Rule (§4.3, 4.4, 4.5)
March 8 – 12	Optimization Problems, Antiderivatives (§4.7, 4.9)
March 15 – 19	Area Under a Curve, Definite Integrals, (§5.1, 5.2)
March 22 – 26	Definite Integrals (con't), Fundamental Theorem of Calculus (§5.2, 5.3)
March 29, 31	Indefinite Integrals, The Substitution Rule (5.4, 5.5)
April 2	Good Friday. University Closed
April 5, 7*, 8*	Final Exam Review / "Catch-up" Time

*Classes on April 7 and April 8 will follow a Friday schedule.

University Policies and Statements

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

Missed or Late Academic Requirements due to Student Absence

As per Senate decision instructors may not require medical notes of students who must miss an academic requirement, including the final exam, for courses offered during fall or winter 2020-21 (until April 30, 2021). Information on regular policy, including the use of the Student Declaration of Absence can be found here:

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

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 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>