

**Faculty of Science Course Syllabus**  
**Department of Mathematics**  
*MATH 1000*  
*Differential & Integral Calculus I*  
*Winter, 2024*

*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](mailto:oafghani@dal.ca)

**Teaching Assistant:** Dylan Pearson

**Time:** January 08 - April 09

**Lectures:**

MWF 11:35-12:25 AM  
Studley-LSC-COMMON AREA C242

**Tutorials:** (To begin the week of January 15)

**T01:** Thursday 4:35-5:25 AM Studley-CHEMISTRY 223  
**T02:** Thursday 11:35-12:25 AM Studley-LSC-COMMON AREA C244  
**T03:** Tuesday 1:35-2:25 AM Studley-DUNN BUILDING 304

**Office Hours:**

MWF 10:00-11:00 AM 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. 8 and support is available Monday through Friday from 11:30am - 4:30pm and Monday through Friday evenings from 6:30- 7:30pm, until Apr. 23. 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 (online)   | 25%                       | TBD<br>March 1, 6:30 pm to 8:30 pm |
| 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         | 50%                       | 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.

| <b>Date</b>            | <b>Content</b>   |
|------------------------|--|
| January 8 - 12         | Tangents, Velocity, Limits,( 2.1 & 2.2)                                      |
| January 15 - 20        | Limit Laws, Continuity, Limits at Infinity (2.3, 2.5 & 2.6)                  |
| January 22 - 26        | The Derivative, Differentiation Rules (2.7, 2.8 & 3.1)                       |
| January 29 - 31        | (3.2, 3.3) Differentiation Rules Cont'd                                      |
| <b>February 02</b>     | <b>Munro Day (No Classes)</b>  |
| <b>February 6</b>      | <b>Last Day to Drop without a "W"</b>  |
| February 5 - 9         | Implicit Differentiation, Logarithmic Differentiation (3.4, 3.5, 3.6)        |
| February 12- 16        | Rates of Change in Science, Exponential Model, Related Rates (3.7, 3.8, 3.9) |
| <b>February 19- 23</b> | <b>Study Week (No Classes)</b>   |
| February 26- March 01  | Linear Approximation, Max /Min Problems (3.10, 4.1)                          |
| <b>March 1</b>         | <b>Midterm: (6:30-8:30 pm)</b>   |
| <b>March 6</b>         | <b>Last Day to Drop with a "W"</b>   |
| March 04 -08           | Mean Value Theorem, Graphing (4.2, 4.3)                                      |
| March 11 -15           | L'Hospital's Rule, Optimization (4.4, 4.5, 4.7)                              |
| March 18 -22           | Antiderivatives, Area Under a Curve, Definite Integrals(4.9, 5.1, 5.2)       |
| March 25 -27           | Fundamental Theorem of Calculus (5.2, 5.3)                                   |
| <b>March 29</b>        | <b>Good Friday (No Classes)</b>  |
| April 01-05            | Indefinite Integrals , The Substitution Rule (5.4, 5.5)                      |
| April 08-09            | Final Exam Review  |

*\*Note that on Monday April 8 and Tuesday April 9, 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. 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.
  5. 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](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](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](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](mailto:elders@dal.ca)).

**Information:** [https://www.dal.ca/campus\\_life/communities/indigenous.html](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](https://www.dal.ca/academics/important_dates.html)

### **University Grading Practices**

[https://www.dal.ca/dept/university\\_secretariat/policies/academic/grading-practices-policy.html](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](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](https://www.dal.ca/campus_life/communities/indigenous.html)

**Black Students Advising Centre:** [https://www.dal.ca/campus\\_life/communities/black-student-advising.html](https://www.dal.ca/campus_life/communities/black-student-advising.html)

**International Centre:** [https://www.dal.ca/campus\\_life/international-centre/current-students.html](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](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](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](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](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>