

# Faculty of Science Course Syllabus

## Department of Mathematics and Statistics

### Math 1000

### Differential & Integral Calculus I

### Fall 2018

#### Instructors

Lecture Section	Instructor	E-mail Address	Office Location
1	Rob Noble	<a href="mailto:rnoble@mathstat.dal.ca">rnoble@mathstat.dal.ca</a>	CHASE 205
2	Keith Johnson	<a href="mailto:johnson@mathstat.dal.ca">johnson@mathstat.dal.ca</a>	CHASE 313
3	Keith Johnson	<a href="mailto:johnson@mathstat.dal.ca">johnson@mathstat.dal.ca</a>	CHASE 313
4	Rob Noble	<a href="mailto:rnoble@mathstat.dal.ca">rnoble@mathstat.dal.ca</a>	CHASE 205
5	Keith Johnson	<a href="mailto:johnson@mathstat.dal.ca">johnson@mathstat.dal.ca</a>	CHASE 313

#### Lectures

Lecture Section	Days	Time	Location
1	MWF	1:35 PM – 2:25 PM	CHEMISTRY 125
2	MWF	8:35 AM – 9:25 AM	LSC-COMMON AREA C242
3	MWF	9:35 AM – 10:25 AM	CHEMISTRY 125
4	MWF	12:35 PM – 1:25 PM	SIR JAMES DUNN 117
5	TR	8:35 AM – 9:55 AM	LSC-COMMON AREA C236

#### Tutorials

1 hour per week, commencing the week of September 17, 2018.

#### 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 Objectives/Learning Outcomes

- 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 sketch a reasonably accurate graph of a given function by hand, using calculus.
- Be able to use calculus to solve optimization and related rates problems.
- Be able to compute derivatives as well as basic integrals.

## Course Materials

- Textbook: Single Variable Calculus – Early Transcendentals, Eighth Edition, by James Stewart. This textbook will also be used in Math 1010.
- 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 can be found under **Content**.
  2. Your grades can be found under **Assessments**.
- Webwork: Your online assignments will appear in webwork, accessed through links appearing under **Content** in BrightSpace.

## Resources

- Dr. Noble's course notes will be available under **Content** on BrightSpace.
- Math & Stats Student Resource Centre (Room 119, first floor of the Chase Building). A calculus tutor will be available on weekdays and evenings on a first come, first served basis, free of charge. There are large tables where you can work together (on Math or Stats only, please). To see the current schedule, please visit the Resource Centre's webpage <http://www.dal.ca/faculty/science/math-stats/about/learning-centre.html>.

## Course Assessment

The Final Grade will be computed as the maximum of the grades obtained from the following two schemes:

### Scheme I:

Component	Weight (% of final grade)	Date
Tutorial Quizzes	15%	Weekly
Midterm Exam	25%	November 2, 2018 (7:00 PM – 9:00 PM)
Final Exam	50%	(Scheduled by Registrar)
Online Assignments	10%	~3 per week

### Scheme II:

Component	Weight (% of final grade)	Date
Tutorial Quizzes	15%	Weekly
Final Exam	75%	(Scheduled by Registrar)
Online Assignments	10%	~3 per week

**Note: It is strongly recommended that you prepare yourself to be graded on the first scheme; the second scheme is included in order to accommodate students who fail to perform up to their ability on the midterm due to circumstances beyond their control.**

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, midterms or final exams can be made up for documented illness or upon receipt of equivalent proof of inability to write at the scheduled time.
- If the university is closed on a particular day of a given week, due to a holiday, then **all** tutorials for that week will be cancelled.
- On exams, we recommend that answers be left in unsimplified form.
- Calculators will NOT be allowed during tutorial quizzes, the midterm or the final examination. In fact, only writing utensils (pencils, lead, erasers, pens, white-out) will be allowed.
- Information about the course may be given during class. It is the responsibility of the students to ensure that they are made aware of what occurs during classes.

## Course Content

The material to be covered consists of the contents of Chapters 2 – 5 of the text book. Specifically, we will try to stick to the following lecture schedule:

Date	Topic
September 5, 7	Tangents, Velocity, Limits (§2.1, 2.2)
September 10 – 14	Limit Laws, Continuity, Limits at Infinity (§2.3, 2.5, 2.6)
September 17 – 21	The Derivative, Differentiation Rules (§2.7, 2.8, 3.1)
September 24 – 28	Differentiation Rules (cont'd) (§3.2, 3.3, 3.4)
<b>October 1</b>	<b>Last day to drop without a “W”</b>
October 1 – 5	Implicit Differentiation, Derivatives of Logarithmic Functions, Logarithmic Differentiation (§3.5, 3.6)
<b>October 8</b>	<b>Thanksgiving (No class)</b>
October 10, 12	Rates of Change in Science, Exponential Growth and Decay (§3.7, 3.8)
October 15 – 19	Related Rates, Linear Approximations, Max/Min Problems (§3.9, 3.10, 4.1)
October 22 – 26	Mean Value Theorem, Graphing (§4.2, 4.3)
October 29	L'Hospital's Rule (§4.4)
<b>October 31</b>	<b>Last day to drop with a “W”</b>

Date	Topic
October 31	Graphing (cont'd) (§4.5)
November 2	Midterm Review / “Catch-up” Time
<b>November 2</b>	<b>Midterm 7:00 PM – 9:00 PM (Up to and including §4.1)</b>
<b>November 4</b>	<b>Midterm Make-up Exam 1:30 PM – 3:30 PM</b>
November 5 – 9	Optimization Problems, Antiderivatives, Area Under a Curve (§4.7, 4.9, 5.1)
<b>November 12 – 16</b>	<b>Fall Study Break (No class)</b>
November 19 – 23	Definite Integrals, Fundamental Theorem of Calculus (§5.2, 5.3)
November 26 – 30	Indefinite Integrals, The Substitution Rule (§5.4, 5.5)
December 3, 4*	Final Exam Review / “Catch-up” Time

\*Note that classes on Tuesday, December 4 will follow a Monday schedule.

## 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)

## 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](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](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 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>