

Course Syllabus

Title: Differential And Integral Calculus I

Subject Code: MATH

Number: 1000

Credit hours: 3

Section: 02

CRN: 30028

Duration: July 2 - August 19, 2009 (7 weeks)

Semester: 2008/2009 Summer (Term B)

Times Monday and Wednesday, 1805-2045.

Classroom: Room 302, Sir James Dunn Building, Dalhousie University.

Description: This class 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 class is MATH 1010.

Credit restrictions: Students who have already received credit for MATH 1000 cannot subsequently receive credit for MATH 1115.

Prerequisites: Nova Scotia Mathematics advanced 11 and 12 or pre-calculus. Pre-calculus is highly recommended.(from Dal Online)

Textbook: *Single Variable Calculus: Early Transcendentals, Sixth Edition*, by James Stewart

Instructor

Name: Mr. Neil A. McKay

Education BSc (Hons) Memorial University of Newfoundland; MSc, PhD Candidate Dalhousie

Department: Mathematics and Statistics

Office: Room 327, Chase Building

Email: nmckay@mathstat.dal.ca

Telephone: None

Course Website: <http://www.mathstat.dal.ca/~nmckay/teaching/m1000/>

Office hours: Tentatively: Monday 3-5, Wednesday 10-12, or by appointment (in class or by email).

Department Information

Website: <http://www.mathstat.dal.ca>

Main Office: Room 219, Chase Building

Learning Centre: Located in on the main floor of the Chase building, and open this semester from 4pm-6pm Monday to Thursday. FREE!

Course learning goals

Calculus content goals:

- Explain the concept of a limit using an example, such as the definition of derivative or integral.
- Explain derivatives as an instantaneous rate of change and as good linear approximations.
- Explain integrals as a limit of Riemann sums (that can represent area under a curve) and as accumulated change.
- Use the Fundamental Theorem of Calculus to explain the relationship between derivatives and integrals (by stating the theorem with necessary assumptions, or otherwise).
- Model problems given in words by finding the appropriate equation that relates the variables, and use calculus where appropriate to solve such a problem.

Mathematics learning goals:

- Work easily with sets, functions, expressions and equations.
- Communicate clearly and effectively in writing.
- Show understanding of theorems and proof by, amongst other things, appropriately referencing theorems in work.
- Check solutions to problems to determine if they are plausible and reasonable based on sign, variables, magnitude, units of measurement, and other information.

Tentative schedule

Week	Topic	Monday	Wednesday
1	Limits and the derivative	Sections 2.1,2.2,2.3	Section 2.5,2.6,2.7,2.8
2	Differentiation rules	Sections 3.1,3.2,3.3	Section 3.4,3.5,3.6
3	Problems involving derivatives	Sections 3.7,3.8,3.9,3.10	Midterm and Sections 4.1,4.2
4	Curve sketching and optimization	Sections 4.3,4.4,4.5,2.6	Sections 4.5,4.7
5	Antiderivatives	Natal Day	Midterm and Section 4.9
6	Integrals	Sections 5.1,5.2,5.3	Sections 5.4,5.5
7	Comprehensive	Review	Final Exam

Note: Likely, if any class is canceled, there will be no review.

Assessment Components There are four categories of evaluation in this course: quizzes, assignments, midterms, and final examination. Each is given a paragraph of explanation with a summary in the table below.

Comprehension quizzes: Due to the condensed nature of this course, we will often be covering material in a lecture that requires understanding of material covered earlier in the class. Therefore, before the break the students will be given a problem to work on. The students are encouraged to ask the instructor questions, but may not ask classmates. Quizzes will be pass/fail with full marks awarded for pass and none for fail. At the instructor's discretion, upon the submission of a quiz, students may be given guidance on the problem and asked to work further on their quiz to receive a pass. There will be quizzes most classes in which there is no midterm, but not necessarily all classes. Students may inform the instructor before class that they will not be attendance and have the mark for that day's quiz (if there is one) transferred to assignments.

Assignments: Practice is key to learning mathematics. Assignments are given and assessed to direct the students' practice and to encourage it to be done. Assignments will normally be due the class after which the relevant material is covered. Like the quizzes, this is to ensure the students are keeping pace with the material that will need to be understood to teach the next topics.

Students learn well from each other and are thus encouraged to work with each other. However, each student be able to do the work by themselves as well. Therefore, submitted work must be the students own. A student must only submit work that they can produce without talking to and without papers from any person (friend, tutor, etc.). For example, two students solve a problem by following an example from the text, each person must then (perhaps after studying and discussing their solution) repeat that work individually without reference to the solution; the student may still consult the text. This should be easy to do if the material is actually understood.

Assignments due on Wednesday for which the relevant material is covered in Monday's class, will be shorter than other assignment due to student time constraints. The overall grade for assignments will be a weighted average, with shorter assignments receiving less weight. The weight of each assignment will be announced in class (usually the class before it is due). The first assignment will be handed out in class. Subsequent assignments will be posted on the course website at least one week before the due date.

Assignments may be submitted only in the following ways:

- in class, preferably at the beginning
- to the instructor in person on campus (at the office, etc.)
- via the Math and Stats department office
- by mail, with appropriate postmark
- by email

In order to post solutions to the assignments online in a timely manner, it is necessary to have a hard deadline for submission of assignments. No assignment received after midnight on the due date will be assessed for grades. If a student is excused from an assignment for illness, or other reason, the student may still submit the assignment for feedback, and the final mark shall be based on the other assignments.

Midterm examinations: The first midterm will cover the material covered up to and including the class before the midterm. The midterm will be graded and be returned in class before the August 4 drop date. The second midterm will focus on the material covered after the first midterm, but the questions will still require a good working knowledge of the material covered on the first midterm. Both midterms will be 75 minutes in length. Lectures will follow in the remainder of the class after the midterms. No calculator use will be permitted during either midterm examination. Students are expected to possess their Dalhousie ID at all midterm examinations. There will be no make-up exams.

Final examination: The final exam is a comprehensive exam worth 50% of the overall course grade. The exam will focus more on material covered later because the material is hierarchical and because some material will not have been covered on a midterm. The exam will be in the regular classroom at the regularly scheduled time (for the full length of the class) on August 19. The exam will be similar to the midterms, with the main difference being the length. No calculator use will be permitted during the final examination. Students are expected to possess their Dalhousie ID at the final examination. Alternate arrangements will (not likely) be made at the discretion of the instructor.

Assessment	Number	Dates	Value(%)	Total(%)
Quizzes	5-10	Random classes	1 each	5-10
Assignments	11	Every class except the last two	Variable	30 less the number of quizzes
Midterm exams	2	July 22 and August 5	10 each	20
Final exam	1	August 19	50	50

Grading policy: Students must understand the material and be comfortable in using it. Moreover, they must show that they can. Assignments and examinations will be graded on clarity as well as methodology and correctness. A good introduction to writing in mathematics is available at <http://www.math.uh.edu/~tomforde/MathWritingGuide.pdf>. Students are not expected to type their assignments, although typed assignments are welcome.

Grade conversion table:

Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F
Range	90-100	85-89.9	80-84.9	75-79.9	70-74.9	65-69.9	62-64.9	58-61.9	55-57.9	50-54.9	0-49.9

University policies: Students are expected to be familiar with the university calendar. In particular, the regulations at <http://ug.cal.dal.ca/UREG.htm>. The following link is to a FAQ which touches on summer courses in particular: <http://www.registrar.dal.ca/regguide/faq/index.html>.

Students with disabilities: As per the university regulations on Students with (Learning) Disabilities, “Students with disabilities requiring assistance from the University shall initiate contact with the Advisor to Students with Disabilities and make the nature of their disability and/or their needs known; and be expected to undertake a reasonable measure of self-advocacy to ensure they are provided with an equal opportunity by Dalhousie University.” In particular, as this course is condensed, even students who have registered with Student Accessibility Services must ensure the instructor has been adequately informed.

Student Guidance: Dalhousie’s portal to student services is <http://myguide.dal.ca>.

Drop policy: Non-attendance does not, in itself, constitute withdrawal. Withdrawals are effective when a student withdraws from classes on the Web at www.dal.ca/online or written notification is received at the Office of the Registrar.

Important dates

Date	Description
July 6	First class
July 8	Last day to add class
July 15	Last day to drop without ‘W’
July 22	First midterm exam
August 3	Natal Day – No class or office hours
August 4	Last day to drop with ‘W’
August 5	Second midterm exam
August 19	Final exam