Calculus I - MATH 100 - A1
CRN 11137

University of Northern British Columbia

Class: 10:00 am - 11:20 am WF Agora 7-152 Jan 03, 2024 - Apr 09, 2024

Essentials

Instructor:	Dr. Mohammad El Smaily (https://smaily.opened.ca)
Email:	mohammad.elsmaily@unbc.ca
Tel:	250-960-6624
Office:	T&L, 10-2044
Office Hours:	Monday from 10:00 AM until 11:30 AM; or by appointment (Email instructor to schedule)

Lectures:

10:00 am - 11:20 am WF Agora 7-152

Course Description:

This course is an introduction to the calculus of one variable, primarily for majors and students in the sciences. Topics include functions of one variable; inverses; limits; continuity; the difference quotient and derivatives; rules for differentiation; differentiability; the mean value theorem; the differential; derivatives of trigonometric, logarithmic and exponential functions; l'Hôpital's rule; higher derivatives; extrema; curve sketching; Newton's method; antiderivatives; definite integrals; the fundamental theorem of calculus; integrals of elementary functions; area between curves; and applications of integration.

Prerequisites[1]: MATH 115 Minimum Grade of C$^-$ or PreCalculus 12 (67%) or Principles of Math 12 (67%).

Textbook:

Calculus—Volume 1. (openstax)

The textbook is open-source (free to download and use). It can be downloaded in PDF format using **this direct link**.

The book's website is available at this link.

Course Web Pages:

We will use Moodle https://moodle.unbc.ca to post any course material and announcements.

[1]There is a "Math Readiness" assessment that you are required to do at the beginning of the term. Read the instructions related to "Math Readiness" on Moodle's MATH 100 page

Practice Problems

Each section in this book is followed by several exercises and problems which vary from easy to challenging. The book has also exercises which are of a project nature. Feel free to work out the exercises which are relevant to each lecture on your own. I will solve some of these exercises during the semester. I may also assign some others as homework. Remember that the homework is mainly to assess your understanding of the material and prepare you for the exams as well.

Grading Scheme:

Your Math 100 final grade is computed according to the following scheme:

Math Readiness Work: **2%**; Lab attendance & Lab assessments[2]: **4**%; Assignments: **18%**;
Midterm Exam 1: **18%**; Midterm Exam 2: **18%**; Final Exam: **40%**

Assignments:

Assignments will be given/posted on the Moodle. Instructions on how to hand-in your homework will be discussed in class or posted on the questions sheet. The due dates will be written on the assignments. Assignments must be handed in on time. Late assignments will only be accepted for medical or compassionate reasons.

Midterm Exams:

There will be **two midterm exams**. Midterm Exam 1 will be on **Friday February 9** and Midterm Exam 2 will be on **Friday March 15**. The *midterm* exams will start at the beginning of class and will be held in class. If you have an unavoidable conflict with a scheduled exam, it is your responsibility to inform me as soon as possible (preferably one week in advance); decisions in this regard will be made on a case-by-case basis. *Students registered with the Access Resource Centre have their time accommodation accordingly*.

Final Exam:

The final exam date, time and location is TBA by the Registrar's Office. Check "UNBC.ca, navigate to **current students** then to **course schedule** to find the date. The url is `https://ssb.unbc.ca/ssb/bwckschd.p_disp_dyn_sched`. The *final exam* will be **comprehensive and will include all the material covered in the course**.

Important Academic Dates:

First Day of Classes: Wed January 3
Midterm 1: Friday February 9
Add/Drop Date: Wed January 17
Withdrawal Date: Thursday February 22
Last Day of Classes: Tuesday April 9
Midterm 2: Friday March 15

[2]If there is a Lab related matter, you can contact Erin Beverdige at the email address Erin.Beveridge@unbc.ca

Final Exam Period: April 10- April 20 (Scheduled by the Registrar)

Expectations:

- It is recommended that you devote at least 6 extra hours of personal work per week to this course. Solve all problems from the assigned homework and the practice problems below each section in the textbook. Discussion with your classmates is encouraged. However keep in mind that on the exams you work independently.
- Do not let yourself fall behind on assignments. Do not postpone getting help until the last minute. The main help in this course is provided by the instructor during office hours.
- Attend all lectures and lab/exercise sessions. Please be considerate of your classmates; try not to be late for class and do not use cell phones during class.
- Review your notes soon after class and prior to the next class.
- During the lecture, participate by answering questions and feel free to interrupt the instructor to ask questions.

A note on calculators & computers:

During MATH 100 exams (midterms and/or final), calculators of any type, computers and online software are not permitted.

Access Resource Centre

The Access Resource Centre (ARC) provides services to students with documented health conditions and/or disabilities. The conditions can range from temporary to permanent and include but are not limited to: chronic health issues (e.g., Crohn's, Diabetes, HIV, Lupus) hearing and visual impairments learning disabilities mental health challenges (e.g., anxiety disorder, borderline personality disorder, depression disorder) neurological disabilities (e.g., ADHD/ADD, Autism Spectrum Disorder, Epilepsy, Concussion, Migraines, Multiple Sclerosis) mobility and other physical disabilities. ARC staff are available, by appointment, to meet with you to determine which academic accommodations can be put in place to support you in achieving their academic goals, provide referrals, and help advocate for you. Students who may have a need for academic accommodation are encouraged to contact ARC:

Email at arc@unbc.ca,

Phone at 250-960-5682 (toll free 1-888-960-5682), or Stop by 5-157.

More details are available at the Access Resource Centre website http://www.unbc.ca/access-resource-centre.

Academic Regulations:

It is the students' responsibility to familiarize themselves with the regulations concerning academic integrity and ensure that their course work conform to the principles of academic integrity. Please read the academic regulations found at:

http://www.unbc.ca/calendar/undergraduate/general/regulations.html.
In particular, read sections 40, 41, 42, 43, 44, and 45.

Tentative syllabus

Numbers in the list below are according to the textbook's table of contents.

- **Chapter 1: Functions and Graphs**
  - 1.1 Review of Functions, 1.2 Basic Classes of Functions, 1.3 Trigonometric Functions, 1.4 Inverse Functions, 1.5 Exponential and Logarithmic Functions
- **Chapter 2: Limits**
  - 2.1 A Preview of Calculus, 2.2 The Limit of a Function, 2.3 The Limit Laws, 2.4 Continuity
- **Chapter3: Derivatives**
  - 3.1 Defining the Derivative, 3.2 The Derivative as a Function, 3.3 Differentiation Rules, 3.4 Derivatives as Rates of Change, 3.5 Derivatives of Trigonometric Functions, 3.6 The Chain Rule, 3.7 Derivatives of Inverse Functions, 3.8 Implicit Differentiation, 3.9 Derivatives of Exponential and Logarithmic Functions.
- **Chapter 4: Applications of Derivatives**
  - 4.1 Related Rates, 4.2 Linear Approximations and Differentials, 4.3 Maxima and Minima, 4.4 The Mean Value Theorem, 4.5 Derivatives and the Shape of a Graph, 4.6 Limits at Infinity and Asymptotes, 4.7 Applied Optimization Problems, 4.8 L'Hôpital's Rule, 4.9 Newton's Method, 4.10 Antiderivatives.
- **Chapter 5:** (Time permitting)
  - 5.2 The Definite Integral
  - 5.3 The Fundamental Theorem of Calculus
  - 5.5 Substitution

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[3] https://libguides.unbc.ca/ld.php?content_id=35082396