UNIVERSITY OF CALGARY
FACULTY OF SCIENCE

Department of Mathematics & Statistics
MS 476
403 220-5210
math@ucalgary.ca

COURSE OUTLINE

1. **Course:** MATH 277, Multivariable Calculus for Engineers and Scientists - Winter 2021

   Lecture 01:

Instructor	Email	Phone	Office	Hours
Yousry Elsabrouty	yelsabro@ucalgary.ca	403 220-2255	MS 418	: W 10:00 - 11:00

   Lecture 02:

Instructor	Email	Phone	Office	Hours
Yousry Elsabrouty	yelsabro@ucalgary.ca	403 220-2255	MS 418	: W 10:00 - 11:00

   Lecture 03:

Instructor	Email	Phone	Office	Hours
Hui Huang	TBA	TBA	TBA	TBA

   Lecture 04:

Instructor	Email	Phone	Office	Hours
Dr Ryan Hamilton	rhamilt@ucalgary.ca	403 220-3950	MS 574	TBA

   Coordinator(s)

Name	Email	Phone	Office	Hours
Yousry Elsabrouty	yelsabro@ucalgary.ca	403 220-2255	MS 418	: W 10:00 - 11:00

Online Delivery Details:

This course does not follow a scheduled meeting pattern.

This course has a registrar scheduled, synchronous final exam. The writing time is 2 hours + 50% buffer time.

1. **Lectures** will be recorded in advance and posted on D2L.

   Students will watch the presentation , pause at any time take

   their own notes as is always done in " In Person Classes ".

2. **Weekly Topics** covered for entire term will be posted in D2L.

   A **recommendation** will be provided on how much should be completed every week

   from all sources of material posted.

3. **Midterm** Test and **Final Examination** will be administered on D2L

   Details will be communicated to all students in advance

4. **Assignments** will be posted and completed online using My Math Lab..

   Assignment Problems will be mostly identical to problems assigned on Study plan.

   The purpose of online assignment (30%) is to encourage you to better

   understand the concept being tested and the being exposed to high quality problems

   that are usually not available in most Textbook.

5. There will be a Weekly**Live Interactive** session on Zoom run by a qualified Instructor.

   Starting from first week , a collection of problems where most students wish to participate

   in the Live interaction session will be sent to course coordinator.

   To make communication more efficient I will ask each**Block Representative**

to undertake the task of the collection of the weekly problems (if they wish to do so).

 Any individual who wish to send problems directly to me is welcome as well

6. All Student are encourage to

    (i) Check announcement posted on D2L at least twice a day

    (II) Use the university of Calgary email address. Other emails addresses may be block by IT Scanner

    (iii) Participate in Live session mentioned in Point # 4 above.

7. **General Concerns** about Assignments, Midterm or Final Exam may be

    communicated to course coordinator by the four block Representatives (again it they wish to do so)

8. **Personal Concerns** of any kind should be sent**directly** to course Coordinator.

9. Weekly Lab Problem will be recorded by Teaching Assistants and posted on D2L.

    Complete hard copies of all labs will be posted every**Friday at 5:00 Pm**

    Posting labs in advance did not work in the last 20 years.

     After lab presentation is viewed , we encourage all students to get problems from recorded session, re do without looking

     at solutions.Only if you stuck, you can read very detailed solutions.

     Office Hours and Emails of all Teaching assistance will be be provided to Students

     with instruction.

10. Course coordinator contact : Y. Elsabrouty

    yelsabro@ucalgary.ca

    Keep it handy for communications.

    I usually respond to **all** emails.

Course Site:

D2L: MATH 277 L01-(Winter 2021)-Multivariable Calculus for Engineers and Scientists

Note: Students must use their U of C account for all course correspondence.

2. **Requisites:**

See section 3.5.C in the Faculty of Science section of the online Calendar.

Prerequisite(s):
Mathematics 275; and Mathematics 211 or 213.
Antirequisite(s):
Credit for Mathematics 277 and 267 will not be allowed.

3. **Grading:**

The University policy on grading and related matters is described in F.1 and F.2 of the online University Calendar.

In determining the overall grade in the course the following weights will be used:

Component(s)	Weighting %	Date
Online Assignments (4)	30%	
Midterm Test (1)	30%	Saturday, March 06 , 10:00 - 11:30 a.m. MST The test is designed to take 1.5 hrs to complete but 45 minutes will be added to the end for Internet issues. Synchronous and online Time will be adjusted for international students.
Final Examination	40%	Final Exam will be scheduled by Registrar's office, Synchronous and online Designed to be 2 hours but students will be given 3 hours to write. Time will be adjusted for international students.

Each of the above components will be given a letter grade using the official university grading system (see section F.1.1). The final grade will be calculated using the grade point equivalents weighted by the percentages given above and then converted to a final letter grade using the official university grade point equivalents.

This course will have a final exam that will be scheduled by the Registrar. The Final Examination Schedule will be published by the Registrar's Office approximately one month after the start of the term. The final exam for this course will be designed to be completed within 2 hours.

The final exam will be administered using an on-line platform. Per section G.5 of the online Academic Calendar, timed final exams administered using an on-line platform, such as D2L, will be available on the platform. Due to the scheduling of the final exams, the additional time will be added to **the end** of the registrar scheduled **synchronous** exam to support students. This way, your exam schedule accurately reflects the **start time** of the exam for any **synchronous** exams. E.g. If a **synchronous** exam is designed for 2 hours and the final exam is scheduled from 9-11am in your student centre, the additional time will be added to the **end** time of the **synchronous** exam. This means that if the exam has a 1 hour buffer time, a synchronous exam would start at 9 am and finish at 12pm. – **updated April 6, 2021**

4. **Missed Components Of Term Work:**

The university has suspended the requirement for students to provide evidence for absences. Please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations.

In the event that a student legitimately fails to submit any online assessment on time (e.g. due to illness etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date. Absences not reported within 48 hours will not be accommodated. If an excused absence is approved, then the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course.

5. **Scheduled Out-of-Class Activities:**

The following out of class activities are scheduled for this course.

Activity	Location	Date and Time	Duration
Examination	WEB-BASED	Saturday, March 6, 2021 at 10:00 am	2.25 Hours

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY. If you have a conflict with the out-of-class-time-activity, please contact your course coordinator/instructor no later than **14 days prior** to the date of the out-of-class activity so that alternative arrangements may be made.

6. **Course Materials:**

Required Textbook(s):

Robert A. Adams & Christopher Essex, *Calculus , A Complete Course*: Person Education Canada.

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam/Camera (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC ELearning online website.

7. **Examination Policy:**

   Class Notes, Formula Sheet & Scientific Calculators are allowed on Midterm Test and Final Examinations.

   Copying from online resources is strictly prohibited.

   Students should also read the Calendar, Section G, on Examinations.

8. **Approved Mandatory And Optional Course Supplemental Fees:**

   There are no mandatory or optional course supplemental fees for this course.

9. **Writing Across The Curriculum Statement:**

   For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also Section E.2 of the University Calendar.

10. **Human Studies Statement:**

    Students will not participate as subjects or researchers in human studies.

    See also Section E.5 of the University Calendar.

11. **Reappraisal Of Grades:**

    A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See Section I.3 of the University Calendar.

    a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **ten business days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall submit the Reappraisal of Graded Term work form to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. See sections I.1 and I.2 of the University Calendar

    b. **Final Exam:** The student shall submit the request to Enrolment Services. See Section I.3 of the University Calendar.

12. **Other Important Information For Students:**

    a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, Mental Health Services Website) and the Campus Mental Health Strategy website (Mental Health).

    b. **SU Wellness Services:** For more information, see www.ucalgary.ca/wellnesscentre or call 403-210-9355.

    c. **Sexual Violence:** The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email (svsa@ucalgary.ca) or phone at 403-220-2208. The complete University of Calgary policy on sexual violence can be viewed at (https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf)

    d. **Misconduct:** Academic integrity is the foundation of the development and acquisition of knowledge and is

based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional Code of Conduct and promote academic integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

> Student Handbook on Academic Integrity
> Student Academic Misconduct Policy and Procedure
> Research Integrity Policy

Additional information is available on the Student Success Centre Academic Integrity page

e. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at procedure-for-accommodations-for-students-with-disabilities.pdf.

Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head of the Department of Mathematics & Statistics, Mark Bauer by email bauerm@ucalgary.ca or phone 403-220-4189. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See Section E.4 of the University Calendar.

f. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information, see Legal Services website.

g. **Student Union Information:** VP Academic, Phone: 403-220-3911 Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: 403-220-3913 Email: sciencerep@su.ucalgary.ca. Student Ombudsman, Email: ombuds@ucalgary.ca.

h. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction (USRI) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.

i. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or non-academic misconduct, in addition to any other remedies available at law.

Course Outcomes:

○ Adapt to the terminology, vocabulary of multivariable calculus and recognize wide range of symbols it employs.
○ Develop an understanding of the key concepts of multivariable calculus and use to compute Limits, Partial Derivatives, Directional Derivatives and Multiple Integrals of functions of several variables.
○ Use available tools such as Implicit function Theorem to significantly reduce the complexity of calculations particularly for Multiple Integrals
○ Perform calculus techniques to solve a wide variety of optimization problems
○ Analyze appropriate real-world problems in interdisciplinary fields
○ Explore the relationship between key multivariable calculus concepts and its geometric representation for an enhanced interpretation of certain physical or natural property

Electronically Approved - Apr 07 2021 10:36

Department Approval

Electronically Approved - Apr 07 2021 11:44

Associate Dean's Approval