



**COURSE OUTLINE**

1. **Course:** MATH 277, Multivariable Calculus for Engineers and Scientists - Winter 2024

**Coordinator(s)**

Name	Email	Phone	Office	Hours
Yousry Elsabrouty	TBA	TBA	TBA	TBA

**Section(s)**

Lecture 01 : R 11:00 - 12:50 in ENE 123 and 11:00 - 12:50 in ENE 127

Instructor	Email	Phone	Office	Hours
Dr. Tracey Balehowsky	tracey.balehowsky@ucalgary.ca	N/A	MS 446	TBA

Lecture 02 : R 11:00 - 12:50 in ICT 114

Instructor	Email	Phone	Office	Hours
Dr Wenyan Liao	wliao@ucalgary.ca	403 220-3946	MS 530	M/W 14:00-15:00

Lecture 03 : R 11:00 - 12:50 in ENG 24

Instructor	Email	Phone	Office	Hours
Yousry Elsabrouty	TBA	TBA	TBA	TBA

Lecture 04 : R 11:00 - 12:50 in ENG 24

Instructor	Email	Phone	Office	Hours
Yousry Elsabrouty	TBA	TBA	TBA	TBA

Lecture 05 : R 16:00 - 17:50 in ENG 24

Instructor	Email	Phone	Office	Hours
Yousry Elsabrouty	TBA	TBA	TBA	TBA

Lecture 06 : R 16:00 - 17:50 in ENG 24

Instructor	Email	Phone	Office	Hours
Yousry Elsabrouty	TBA	TBA	TBA	TBA

Lecture 07 : W 11:00 - 12:50 in ENE 123 and 11:00 - 12:50 in ENE 127

Instructor	Email	Phone	Office	Hours
Dr Wenyan Liao	wliao@ucalgary.ca	403 220-3946	MS 530	M/W 14:00-15:00

Lecture 08 : W 11:00 - 12:50 in ICT 114

Instructor	Email	Phone	Office	Hours
Dr Mohammed Aiffa	aiffam@ucalgary.ca	403 220-6313	MS 432	10:00-12:00

Lecture 09 : F 11:00 - 12:50 in ICT 217

Instructor	Email	Phone	Office	Hours
Dr Mohammed Aiffa	aiffam@ucalgary.ca	403 220-6313	MS 432	10:00-12:00

Lecture 10 : F 11:00 - 12:50 in ENG 03

Instructor	Email	Phone	Office	Hours
Dr. Tracey Balehowsky	tracey.balehowsky@ucalgary.ca	N/A	MS 446	TBA

Lecture 11 : W 14:00 - 15:50 in ENG 24

Instructor	Email	Phone	Office	Hours
Dr Mohammed Aiffa	aiffam@ucalgary.ca	403 220-6313	MS 432	10:00-12:00

Lecture 12 : W 14:00 - 15:50 in ENG 24

Instructor	Email	Phone	Office	Hours
Dr Mohammed Aiffa	aiffam@ucalgary.ca	403 220-6313	MS 432	10:00-12:00

Lecture 13 : W 12:00 - 13:50 in ENG 24

Instructor	Email	Phone	Office	Hours

Lecture 14 : W 12:00 - 13:50 in ENG 24

**Instructor**                      **Email**                      **Phone**                      **Office**                      **Hours**

Responding to Student's Emails:

Due to the very large volume of emails received, students are expected to receive a reply within 24 hours

except on weekends and holidays.

To account for any necessary transition to remote learning for the current semester, courses with in-person lectures, labs, or tutorials may be shifted to remote delivery for a certain period of time. In addition, adjustments may be made to the modality and format of assessments and deadlines, as well as to other course components and/or requirements, so that all coursework tasks are in line with the necessary and evolving health precautions for all involved (students and staff).

**In Person Delivery Details:**

1. During the scheduled two hours Block classes :

(i) Active Learning (in Groups) will take place every week

(ii) Nine Quizzes will be held in person online / D2L

2. During the scheduled one hour Block classes :

(i) Material of weekly recorded lectures will be discussed by Instructors.

(ii) Diagnose students difficulty ( If any) followed by a brief presentation

(iii) Respond to all questions that may arise from the discussion

**Course Site:**

D2L: MATH 277 All Lectures - Winter 2024 - Multivariable Calculus for Engineers and Scientists

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

**Equity Diversity & Inclusion:**

The University of Calgary is committed to creating an equitable, diverse and inclusive campus, and condemns harm and discrimination of any form. We value all persons regardless of their race, gender, ethnicity, age, LGBTQIA2S+ identity and expression, disability, religion, spirituality, and socioeconomic status. The Faculty of Science strives to extend these values in every aspect of our courses, research, and teachings to better promote academic excellence and foster belonging for all.

**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:

Course Component	Weight	Due Date (duration for exams)	Modality for exams	Location for exams
Weekly in Class Quizzes <sup>1</sup>	63%	Ongoing		
Registrar Scheduled Final Exam	37%	Will be available when the final exam schedule is released by the Registrar	online	Will be available when the final exam schedule is released by the Registrar

<sup>1</sup> Nine - 50 minutes quizzes (Quizzes are 30 minutes each, plus 10 minutes for Internet / Browser issues) will be held in person in the second hour of the scheduled two hours block Classes during the weeks of : January 22, 29, February 05,12, 26 , March 04 , 11, 18 and April 02. Dates are subject to change upon adequate notice.

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 Registrar Scheduled Final exam that will be delivered on-line. [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.

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.

A Passing Grade in the Final Examinations ( Grade of D or Better) is Required to Obtain a Grade of " D " or Better in the Course.

Note : D is 1.00 on the University of Calgary 4-point Grading System.

The University of Calgary offers a [flexible grade option](#), Credit Granted (CG) to support student's breadth of learning and student wellness. Faculty units may have additional requirements or restrictions for the use of the CG grade at the faculty, degree or program level. To see the full list of Faculty of Science courses where CG is not eligible, please visit the following website: <https://science.ucalgary.ca/current-students/undergraduate/program-advising/flexible-grading-option-cg-grade>

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

In the event that a student legitimately fails to submit any online or in-person assessment on time (e.g. due to illness, domestic affliction, 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, or possible exemption and reweighing of components. Absences not reported within 48 hours will not be accommodated. Students may be asked to provide supporting documentation ([Section M.1](#)) for an excused absence, See [FAQ](#).

If an excused absence is approved, options for how the missed assessment is dealt with is at the discretion of the coordinator or course instructor. Some options such as an exemption and pro-rating among the components of the course may not be a viable option based on the design of this course.

**Missed Quizzes** weight will be automatically added to Final Examination weight.

**Please contact Course Coordinator for extended absence due to illness or Emergency.**

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

There are no scheduled out of class activities for this course.

#### 6. Course Materials:

Recommended Textbook(s):

None, *No Textbook Required.*: None.

Recorded Lectures , Complete Class Notes and Active Learning Sheets will be posted on D2L

These Copy Right material are intended only for **Personal Use** and can not be distributed in any form.

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:

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

For more information please refer to the UofC [ELearning](#) online website.

## 7. Examination Policy:

1. Quizzes , and Final Examination will be held online in D2L.

Simply click on Assessments and chose Quizzes from the drop down menu.

2. Quizzes , and Final Examination are all **Open Book**.

However, you are not allowed to work with some one, or copy from online resources (which can be easily detected).

3. You will have to agree to a statement posted on every online testing component indicating that :

- (i) you neither give nor receive aid from any other person
- (ii) the work completed is entirely your own

### **Aids:**

Here is a list of Aides allowed in Quizzes , and Final Examination:

- (i) All Material posted on D2L.
- (ii) Your own Notes made from Lectures , Labs or Tutorials.
- (iii) Other material recommended by your professors such as formula sheet , etc.
- (iii) A scientific non-programmable Calculator.

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 their [website](#) or call [403-210-9355](tel: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](mailto:svsa@ucalgary.ca)) or phone at [403-220-2208](tel:403-220-2208). The complete University of Calgary policy on sexual violence can be viewed [here](#).
- d. **Student Ombuds Office:** A safe place for all students of the University of Calgary to discuss student related issues, interpersonal conflict, academic and non-academic concerns, and many other problems.
- e. **Student Union Information:** [SU contact](#), Email your SU Science Reps: [science1@su.ucalgary.ca](mailto:science1@su.ucalgary.ca), [science2@su.ucalgary.ca](mailto:science2@su.ucalgary.ca), [science3@su.ucalgary.ca](mailto:science3@su.ucalgary.ca).
- f. **Academic Accommodation Policy:**

It is the student's responsibility to request academic accommodations according to the University policies and procedures listed below. The student accommodation policy can be found at: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Student-Accommodation-Policy.pdf>

Students needing an accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities: <https://www.ucalgary.ca/legal-services/sites/default/files/teams/1/Policies-Accommodation-for-Students-with-Disabilities-Procedure.pdf>.

Students needing an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, by filling out the [Request for Academic Accommodation Form](#) and sending it to Jerrod Smith by email [jerrod.smith@ucalgary.ca](mailto:jerrod.smith@ucalgary.ca) preferably 10 business days before the due date of an assessment or scheduled absence.

- g. **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](#)  
[Faculty of Science Academic Misconduct Process](#)  
[Research Integrity Policy](#)

Additional information is available on the [Student Success Centre Academic Integrity page](#)

- h. **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.
- i. **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.
- j. **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.

#### Course Outcomes:

- o 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 - Jan 02 2024 12:30

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**Department Approval**

Electronically Approved - Jan 03 2024 09:28

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**Associate Dean's Approval**