

MATH 213 - Vector Calculus

Section 001

Winter 2022

General information

Instructor: Martin Frankland

Email: Martin.Frankland@uregina.ca

Office: CW 307.17

Office hours: MW 3-4 PM. The Zoom link is posted on UR Courses.
In person meeting by appointment.

Lectures: TR 10:00 – 11:15 AM.

January 11 – February 17: **on Zoom**. From March 1: in room **CL 128**.

Tutorials: Wednesdays 10:00 – 10:50 AM.

January 12 – February 16: **on Zoom**. From March 2: in room **CL 126**.

The Zoom link for lectures and tutorials is posted on UR Courses. Updated information will be posted on UR Courses.

Textbook: *Calculus*, 9th Edition, by James Stewart, Daniel Clegg, and Saleem Watson.

Optional textbook: *Calculus Volume 3*, by Edwin Herman and Gilbert Strang. Open textbook available for free at:

<https://open.umn.edu/opentextbooks/textbooks/371>

Prerequisites: MATH 111 and 122.

UR Courses: <https://urcourses.uregina.ca/>

This site will contain announcements, additional course material, and solutions to selected problems. The site is updated throughout the semester, so please check back regularly.

Course outline

Vector calculus concerns functions of several variables and functions whose values are vectors rather than just numbers. In this broader context, we will revisit derivatives and integrals, as well as their applications, like finding minima and maxima. We will explore new geometric objects such as vector fields, curves, and surfaces and study how these relate to differentiation and integration.

The course covers the following topics.

- Vector functions.
- Functions of several variables.
- Minima and maxima of functions of several variables.
- Double integrals. Polar coordinates.
- Triple integrals. Cylindrical and spherical coordinates.
- Vector fields and line integrals.
- Surface integrals, curl, and divergence.

Tutoring services

- Math and Stats Tutoring:
<https://www.uregina.ca/science/mathstat/undergrad/resources/tutor-info.html>
- Student Success Centre:
<https://www.uregina.ca/student/ssc/tutoring/math-stats-tutoring/>
- Global Learning Centre:
<https://www.uregina.ca/international/global-learning-centre/glc-services-programs.html#tutoring>
- Champion College Math/Stats Help Centre:
<https://championcollege.ca/student-services/math-stats-tutoring/>

Grading scheme

- Midterm 1: 20%
- Midterm 2: 20%
- Final Exam: 40%

- Homework: 15%
- Tutorials: 5%

Course delivery and computer requirements

The course is taught **remotely** at the beginning. We will transition to in person delivery when it will be appropriate to do so. Updated information will be posted on UR Courses as it becomes available.

Here are the technology requirements for remote delivery.

- A computer, laptop, or similar device, with a reliable internet connection.
- A way of submitting work online, e.g., a smartphone camera or a scanner. Writing on a tablet with a stylus is another option.
- A camera and microphone are not required, though recommended in order to facilitate participation.

Note: Most laptops have a built-in camera and microphone, which work fine for our purposes.

The course has both synchronous and asynchronous components.

- **Synchronous:** Lectures during the designated schedule. Problem sessions during the tutorials.
- **Asynchronous:** Selected readings, additional notes and worked examples, online work.

Exams

- Midterm 1: **Wednesday February 9.**
- Midterm 2: **Wednesday March 16.**
- Final Exam: **Saturday April 16, 2:00 - 5:00 PM.**

Details for each exam will be confirmed. Midterms will occur during the tutorial.

The Final Exam covers the entire semester, with emphasis on later sections.

All exams will be **closed book**. Only a single two-sided crib sheet will be allowed.

Homework

Homework will be assigned more or less weekly and submitted online on WeBWorK.

Late homework will not be accepted.

The **lowest homework score** will be dropped.

Tutorials

The grade for tutorials is based on participation. There will be a way to obtain the grade even if you can't attend a tutorial. Details will be posted on UR Courses.

The **lowest tutorial score** will be dropped.

Missed course work

Information about missed course work can be found in the *Academic Regulations*, section "Deferral of Final Exams or Course Work", available at:

<https://www.uregina.ca/student/registrar/resources-for-students/academic-calendars-and-schedule/undergraduate-calendar/sections.html>

See in particular the sections "Grounds for Deferral" and "Supporting Documentation".

Illness: If you are unable to meet a course requirement due to prolonged illness or other serious circumstances, please contact me as soon as possible. In that case, you should fill out the *Self-Declaration of Illness* and submit it to me. The form is available at:

https://www.uregina.ca/student/registrar/assets/docs/pdf/forms/UofR-Self_Declaration_of_Illness_Form.pdf

More information is available at:

<https://www.uregina.ca/hr/hsw/COVID-19-Resources/Reporting-Procedures-if-a-student-is-ill/>

Homework: If you miss a homework assignment for any reason, it will count as the lowest assignment being dropped. There will be no make-up homework.

Midterm: In case of excused absence from a midterm, the midterm will be dropped and the course grade will be calculated out of the remaining 80 course points. There will be no make-up midterm.

It is your responsibility to provide documentation before the exam, or as soon as possible after the exam in case of illness or emergency. Undocumented absences receive a grade of zero.

Final: You will need to submit the form *Deferral of term work and/or final exam*, available at:

https://www.uregina.ca/student/registrar/assets/docs/pdf/forms/deferral_form.pdf

For more information, please consult the *Academic Regulations*, section “Deferral of Final Exam”, or contact the Science Academic Hub:

<https://www.uregina.ca/science/student/>

Academic integrity

Working on practice problems with your peers is allowed. However, each student must write exams and homework **on their own**. Handing in suspiciously similar solutions will be considered an instance of cheating.

Handing in any material copied from the internet, a program, or another source will likewise be considered cheating.

Scholastic offences are taken seriously and will not be tolerated. For more information, please consult the *Student Code of Conduct and Right to Appeal*, section “Academic Misconduct”, available at:

<https://www.uregina.ca/student/registrar/resources-for-students/academic-calendars-and-schedule/undergraduate-calendar/sections.html>

as well as the *Faculty of Science Student Handbook*, section “Academic Integrity”, available at:

<https://www.uregina.ca/science/assets/docs/pdf/programpdf/new-student-manual.pdf>

Accessibility

Any student with special needs who may need accommodation should contact the Centre for Student Accessibility at:

<https://www.uregina.ca/student/accessibility/>

After I receive the letter from the Centre for Student Accessibility, please contact me to discuss the accommodation.