

**Mathematics 200**  
**Calculus III**

**Mathematics 200, Calculus III. Term 2: January-April 2023**

**Sections:**

Section 202 will meet MWF 11-12 in LSK 200.

Section 204 will meet MWF 3-4 in LSK 200.

Section 20R is a hybrid section, meeting TTh 12:30-2:00 on Zoom

Each section will have its own lectures and midterms. We will coordinate these to achieve some degree of uniformity. The homework and the final exam will be the same for all sections.

**Instructors:**

Michael Bennett (Section 202),

Benjamin Bruce (Section 20R),

Zinovy Reichstein (Section 204).

**Textbook:** CLP3 multivariable calculus by Joel Feldman, Andrew Rechnitzer and Elyse Yeager, <https://personal.math.ubc.ca/~CLP/CLP3/>

**Course material:** There are three parts to this course, listed below. They correspond to Chapters 1, 2 and 3 in the book. We will allocate roughly 3 weeks to Chapter 1, 5 weeks to Chapter 2 and 5 weeks to Chapter 3, covering the following topics.

I. 3-Dimensional Geometry (Chapter 1, except §1.6)

- Three dimensional coordinate systems,
- Vectors, arithmetic, dot and cross products,
- Equations of lines and planes,
- Equations of surfaces.

II Differentiation of Multivariable Functions (Chapter 2)

- Functions of several variables,
- Limits and continuity,
- Partial derivatives,
- Tangent planes and linear approximations,
- Chain rule,
- Directional derivatives, gradient,
- Maximum and minimum values, Lagrange multipliers.

III. Integration of Multivariable Functions (Chapter 3, except §3.4 § 3.8)

- Double and iterated integrals,
- Double integrals in polar coordinates,
- Triple integrals in Cartesian coordinates
- Triple integrals in cylindrical and spherical coordinates
- Applications.

**Homework:** Webwork problem sets will be assigned on a weekly basis. Each assignment will be due by 9pm on Friday, starting in Week 2.

**Exams:** Two midterm exams will be held during regularly scheduled class hours on the following dates.

Midterm 1: Thursday February 9 (Section 20R) or Friday, February 10 (Sections 202 and 204).

Midterm 2: Thursday, March 23 (Section 20R) or Friday, March 24 (Sections 202 and 204)

Note for Section 20R: All exams (midterm and final) will be given in-person. Location will be announced ahead of each exam.

The date and time of the final exam will be set by UBC's central administration. Usually the final exam schedule is announced half way through the term; we have no control over the timing of this announcement or over the final exam date.

**Marking scheme:** We will compute the total term mark for each student in two ways as follows.

Total 1 := Homework (10%) + Midterm1 (20%) + Midterm 2 (20%) + Final exam (50%)

Total 2 := Homework (10%) + Best midterm (30%) + Final Exam (60%).

We will then use the higher of these two marks. Note that you can miss (or do poorly on) one homework assignment and one midterm without a penalty, no explanation required. These concessions are intended to cover all eventualities, including illness and emergencies; please use them sparingly.

**Further information** will be available on Canvas.