



MAST 218: Multivariable Calculus I (Fall 2026)

Instructor: _____

Email Address: _____

Office Hours: _____

Important: Students should get the above information from their instructor and from the course Moodle site. The instructor is the person to contact should there be any questions about the course.

Class Schedule: _____

Prerequisites: MATH 204 and MATH 205, or equivalent.

Reading Week

Begins on Saturday, October 10 and ends on Friday, October 16, 2026. No classes that week.

Recommended texts

Multivariable Calculus, 9th Edition by J. Stewart, (Cengage Learning, © 2020) ISBN: 9780357042922 (hardcover) and 9780357746943 (e-book), available at the reserve desk of the library and at the university's bookstore <https://www.bkstr.com/concordiastore/home>.

Note: Students should order textbooks as early as possible, especially for printed versions in case books are backordered or there are any shipping delays.

The 8th Edition is not available for purchase, but you may use it for this course if you already have it.

Calculus, Volume 3, by G. Strang and E. Herman, (OpenStax, 2016) This is a free online textbook, available at <https://openstax.org/details/books/calculus-volume-3>

The course outline has the weekly sections and suggested problems for both editions (see tables on pages 3-4) of Stewart's textbook, as well as for the free web resource *Calculus, volume 3* from OpenStax.

WeBWorK

Every student will be given access to an online system called **WeBWorK**. Students will use this system to do online assignments (see Assignments below).

Assignments

Assignments are *very important* as they indicate the level of difficulty of the problems that students are expected to solve and understand. Therefore, every effort should be made to do and understand them. Students are expected to submit assignments online using **WeBWorK**. Late assignments will not be accepted. Assignments contribute 10% to the final grade. The lowest grade assignment will be dropped (this could be an assignment marked as zero for not being submitted due to illness or late enrollment).

Students are also strongly advised to work on the suggested problems, and similar ones, in the tables on pages 3-4, as these problems are similar to some exam problems. There are three lists depending on what text students choose; doing all the problems in any one of these lists is a good preparation for tests. Each reference contains answers to odd-numbered problems.

Web Resources

Stewart Calculus offers several paid-for resources that you may use at the site https://www.stewartcalculus.com/media/11_home.php

In addition, OpenStax, the world's largest publisher of open education resources provides under the listing of *Calculus, volume 3* a variety of problems, in addition to a free, peer-reviewed textbook that covers the standard material you will see in this course:

<https://openstax.org/details/books/calculus-volume-3>

A selection of suggested problems from OpenStax has been included for your practice in a table on pages 4-5.

Use of Software

It is optional but strongly recommended to use software such as SageMath, Maple, Mathematica or WolframAlpha to verify and illustrate the analytical results you get while solving your assignment problems. Exploration with online graphing calculators such as Geogebra or Desmos is also encouraged as part of the learning process.

Calculators

Only calculators approved by the Department (with a sticker attached as proof of approval) are permitted for the class test and final examination. For a list of Approved calculators see <https://www.concordia.ca/artsci/math-stats.html>

Tests

One class midterm test covering the material of the first five weeks will be given in week 6 or 7. The exact date will be announced in class during the first 2-3 weeks. **There is no make up for a missed midterm.** The final examination will cover material from the entire course.

PLEASE NOTE: Students are responsible for finding out the date and time of the final exam once the schedule is posted by the Examination Office. Any conflicts or problems with the scheduling of the final exam must be reported directly to the Examination Office, **not** to your instructor. It is the

Department's policy and the Examination Office's policy **that students are to be available until the end of the final exam period. Conflicts due to travel plans will not be accommodated.**

Final Grade

The higher of the following:

- 90% final exam, 10% assignments, or
- 30% midterm, 10% assignments, and 60% final.

There is no 100% option for this course.

If the grading scheme for this course includes graded assignments, a reasonable and representative subset of each assignment may be graded. Students will not be told in advance which subset of the assigned problems will be marked and should therefore attempt all assigned problems.

Scheduling and assignments for the 8th Edition (weeks 6 and 7 may be switched at the instructor's discretion):

Week	Sections	Topics	Suggested problems
1	10.1 10.2	Parametric equations of curves Calculus with parametric curves	10.1: 8, 17, 24, 28 10.2: 6, 16, 32, 42
2	10.3 10.4 10.5	Polar coordinates Areas and lengths in polar coordinates Conic sections	10.3: 20, 28, 32, 42, 54 10.4: 12, 26, 30, 48 10.5: 8, 16, 24, 30, 44, 48
3	10.6 12.1	Conic sections in polar coordinates. Three-dimensional coordinate systems	10.6: 10, 12, 14 12.1: 20, 23, 32, 36, 38
4	12.2 12.3 12.4	Vectors Dot product Cross product	12.2: 20, 26, 28 12.3: 22, 24, 42, 45, 47, 64 12.4: 4, 18, 36, 44
5	12.5 12.6	Equations of lines and planes Cylinders and quadric surfaces	12.5: 10, 20, 22, 30, 34, 38, 62, 74 12.6: 12, 14, 18, 21-28
6		Review Chapters 10 and 12 Midterm Evaluation	
7	13.1 13.2	Vector functions and space curves Derivatives and integrals of vector functions	13.1: 32, 42, 50 13.2: 24, 26, 36
8	13.3 13.4	Arc length and curvature of space curve Velocity and acceleration	13.3: 4, 6, 24, 30, 50 13.4: 18 (a), 23, 24
9	14.1 14.2 14.3	Functions of several variables Limits and continuity Partial derivatives	14.1: 18, 30, 48 14.2: 12, 14, 18, 38, 40 14.3: 50, 68, 76 (d)
10	14.4 14.5	Tangent planes and linear approximation Chain rule	14.4: 6, 16, 26 14.5: 8, 12, 34, 46
11	14.6 14.7	Directional derivatives and gradient vector Maximum and minimum values	14.6: 6, 24, 29, 32, 46, 54, 56, 61 14.7: 20, 32, 36, 50, 52, 59
12	14.8	Lagrange multipliers Review	14.8: 1, 4, 6, 16, 18

Scheduling and assignments for the 9th Edition (weeks 6 and 7 may be switched at the instructor's discretion):

Week	Sections	Topics	Suggested problems
1	10.1 10.2	Parametric equations of curves Calculus with parametric curves	10.1: 10, 17, 30, 34 10.2: 9, 13, 35, 49
2	10.3 10.4 10.5	Polar coordinates Areas and lengths in polar coordinates Conic sections	10.3: 19, 27, 35, 45, 56 10.4: 11, 27, 31, 51 10.5: 7, 15, 23, 31, 45, 49
3	10.6 12.1	Conic sections in polar coordinates Three-dimensional coordinate systems	10.6: 7, 15, 17, 19 12.1: 21, 25, 32, 35, 41, 42
4	12.2 12.3 12.4	Vectors Dot product Cross product	12.2: 21, 26, 27 12.3: 21, 23, 41, 45, 47, 64 12.4: 3, 19, 35, 44
5	12.5 12.6	Equations of lines and planes Cylinders and quadric surfaces	12.5: 9, 19, 21, 30, 35, 37, 61 12.6: 15, 17, 21, 23-30
6		Review Chapters 10 and 12 Midterm Evaluation	
7	13.1 13.2	Vector functions and space curves Derivatives and integrals of vector functions	13.1: 25-30, 39, 53, 57 13.2: 25, 27, 37, 43
8	13.3 13.4	Arc length and curvature of space curve Velocity and acceleration	13.3: 5, 7, 27, 35 13.4: 17 (a), 23, 24
9	14.1 14.2 14.3	Functions of several variables Limits and continuity Partial derivatives	14.1: 9, 29, 49 14.2: 11, 25, 29, 49, 53 14.3: 41, 63, 77 (d)
10	14.4 14.5	Tangent planes and linear approximation Chain Rule	14.4: 7, 9, 21 14.5: 13, 15, 37
11	14.6 14.7	Directional derivatives and gradient vector Maximum and minimum values	14.6: 5, 26, 29, 35, 39, 51, 61, 63 14.7: 21, 33, 39, 53, 55
12	14.8	Lagrange multipliers Review	14.8: 1, 3, 7, 23

Openstax's suggested problems at <https://openstax.org/details/books/calculus-volume-3>

Week	Sections (OpenStax)	Topics	Suggested problems
1	1.1 1.2	Parametric equations of curves Calculus with parametric curves	1, 3, 11, 29, 39, 43 69, 71, 107, 109, 113
2	1.3 1.4 1.5	Polar coordinates Areas and lengths in polar coordinates Conic sections	127, 133, 135, 163, 169, 175, 177, 183 195, 209, 213, 219 259, 275, 299, 305, 306
3	1.5 2.2	Conic sections in polar coordinates. Three-dimensional coordinate systems	281, 287, 291, 295 69, 71, 75
4	2.1-2.2 2.3 2.4	Vectors Dot product Cross product	35, 83, 93, 107 135, 143, 155, 167, 180 185, 195, 225, 233

5	2.5 2.6	Equations of lines and planes Cylinders and quadric surfaces	245, 251, 255, 261, 281, 283, 293 309, 311, 313-318, 339
6		Review + Midterm Evaluation	
7	3.1 3.2	Vector functions and space curves Derivatives and integrals of vector functions	1, 3, 5, 15, 36 41, 51, 53, 57, 101
8	3.3 3.4	Arc length and curvature of space curve Velocity and acceleration	103, 107, 131, 133, 139 181, 183, 187
9	4.1 4.2 4.3	Functions of several variables Limits and continuity Partial derivatives	7, 25, 45 81, 85, 97, 107 125, 135, 145, 149
10	4.4 4.5	Tangent planes and linear approximation Chain Rule	175, 181, 199, 204 237, 243, 257
11	4.6 4.7	Directional derivatives and gradient vector Maximum and minimum values	273, 303, 307 339, 345, 347, 349, 357
12	4.8	Lagrange multipliers Review	363, 371, 373

Final Note:

Active participation in classes and continuous work on the course material throughout the term is important for success in this course. Read the course material, practice as many problems as you can, and do the assignments on your own. By assuming responsible behavior (see also the **Academic Integrity and the Academic Code of Conduct** below), you will also achieve a better understanding of the material.

Student Services

You may wish to access the many services available to you as a Concordia student. An overview of these resources can be found here: <https://www.concordia.ca/students/services.html>

Academic Integrity and the Academic Code of Conduct

This course is governed by Concordia University's policies on Academic Integrity and the Academic Code of Conduct as set forth in the Undergraduate Calendar and the Graduate Calendar. Students are expected to familiarize themselves with these policies and conduct themselves accordingly. "Concordia University has several resources available to students to better understand and uphold academic integrity. Concordia's website on academic integrity can be found at the following address, which also includes links to each Faculty and the School of Graduate Studies: <https://www.concordia.ca/conduct/academic-integrity.html>" [Undergraduate Calendar, Sec 17.10.2]

Behaviour

All individuals participating in courses are expected to be professional and constructive throughout the course, including in their communications.

Concordia students are subject to the [Code of Rights and Responsibilities](#) which applies both when students are physically and virtually engaged in any University activity, including classes, seminars, meetings, etc. Students engaged in university activities must respect this Code when engaging with any members of the Concordia community, including faculty, staff, and students, whether such interactions are verbal or in writing, face to face or online/virtual. Failing to comply with the Code may result in charges and sanctions, as outlined in the Code.

Generative AI

The use of generative artificial intelligence tools or apps for assignments in this course, including tools like ChatGPT and other AI writing or coding assistants is prohibited. You are encouraged to discuss assigned problems with classmates, but the submitted work must be your own.

Intellectual Property

Content belonging to instructors shared in online courses, including, but not limited to, online lectures, course notes, and video recordings of classes remain the intellectual property of the faculty member. It may not be distributed, published or broadcast, in whole or in part, without the express permission of the faculty member. Students are also forbidden to use their own means of recording any elements of an online class or lecture without express permission of the instructor. Any unauthorized sharing of course content may constitute a breach of the [Academic Code of Conduct](#) and/or the [Code of Rights and Responsibilities](#). As specified in the [Policy on Intellectual Property](#), the University does not claim any ownership of or interest in any student IP. All university members retain copyright over their work.

Use of Concordia email

Your [Concordia email](#) is the official channel for all university communications, as required by the university's [Policy on Concordia email accounts for students and employees](#). Please use your Concordia email for all communication related to this course and check it regularly so you don't miss important information. [Learn more about how to access your Concordia email](#).

As a student, you are expected to follow the email policy and to use your Concordia email in a respectful and responsible manner. The policy helps ensure that communication across the university is secure, reliable, and consistent.

Extraordinary circumstances

In the event of extraordinary circumstances and pursuant to the [Academic Regulations](#) the University may modify the delivery, content, structure, forum, location and/or evaluation scheme. In the event of such extraordinary circumstances, students will be informed of the change.