

MAST 218
Multivariable Calculus I
Fall 2020

Instructor*: _____

Email: _____

Office Hours: _____

*Students should get the above information from their instructor during class time. The instructor is the person to contact should there be any questions about the course.

Note: This course will be entirely ONLINE with the lectures organized on the Zoom platform.

Text: *Multivariable Calculus*, 8th Edition by J. Stewart, Cengage Learning, 2015.
The digital version of the textbook will be available at:
<https://www.co-opbookstore.ca/service/textbooks/>
The print version of the textbook will be available at:
<https://www.bkstr.com/concordiastore/home>
Note: Students should order textbooks as early as possible, especially for print versions in case books are backordered or there are any shipping delays.

Prerequisites: Math 204 and 205 or equivalent.

Office Hours: TBA
Your professor will announce his office hours during which he will be available to provide help with the material of the course. The office hours will also be held on Zoom. Additionally, one can also send questions to the instructor via email. Note that the system does not allow one to reply to an email sent from Moodle. Thus, emails should be sent from one's own emailer, not Moodle. Note, however, that if you missed a lecture, it is not reasonable to expect your professor to cover the missed material for you either during office hours or outside them.

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. Students are also strongly advised to work on the suggested problems in the table on page 3.

Web Resources: Many excellent animated illustrations to the text of the book are collected at the site www.stewartcalculus.com, see TEC (Tools for Enriching Calculus) for the edition 6. Regular use of this resource is recommended.

Use of Computer Algebra System: It is optional but strongly recommended to install and use Mathematica. The software can be used to verify and illustrate analytical results you get while doing your assignment problems.

Calculators: Only calculators approved by the Department such as **SHARP EL-531** and the **CASIO FX-300MS** are permitted for the class test and the final examination.

For the list of approved and non-approved calculators see:
<http://www.concordia.ca/artsci/math-stats/services.html#calculators>

Evaluation: **Midterm Dates:**

| | | |
|--------|---------|--|
| Test 1 | Week #4 | Sunday, October 4 th , 12-1 pm |
| Test 2 | Week #8 | Sunday, November 1 st , 12-1 pm |

Tests are online. The material covered will be announced in class prior to the test. There will be no make-up tests. If you have a documented, legitimate reason for missing a test, the weight of the term test will be transferred to your final exam. **Students with course conflicts, or any other conflicts, with writing any of the tests must inform their instructor by e-mail no later than Friday, Sept. 18, 2020.**

Missing Term Tests

Tests that are missed due to legitimate extenuating circumstances, such as illness must be supported by appropriate documentation. This documentation should be scanned and submitted by e-mail to your instructor within three working (3) days of the date of the test.

The **final exam** will be two hours long, takes place online, and covers the material of the entire course.

Final Grade:

The highest of the following:

- 10% assignments, 20% each midterm, and 50% final exam.
- 10% assignments, 20% the best midterm score, and 70% final exam.

There is no 100% option for this course.

| Week | Sections | Topics | Suggested problems |
|------|----------|---|----------------------------------|
| 1 | 10.1 | Parametric equations of curves | 10.1: 8, 16, 24 |
| | 10.2 | Calculus with parametric curves | 10.2: 6, 16, 32, 42 |
| 2 | 10.3 | Polar coordinates | 10.3: 20, 28, 32 |
| | 10.4 | Areas and lengths in polar coordinates | 10.4: 12, 26, 30, 48 |
| | 10.5 | Conic sections | 10.5: 8, 30, 44 |
| 3 | 10.6 | Conic sections in polar coordinates. | 10.6: 10, 12, 14 |
| | 12.1 | Three-dimensional coordinate systems | 12.1: 20, 22, 38 |
| 4 | 12.2 | Vectors | 12.2: 26 |
| | 12.3 | Dot product | 12.3: 22, 24, 42, 56 |
| | 12.4 | Cross product | 12.4: 4, 18, 44 |
| 5 | 12.5 | Equations of lines and planes | 12.5: 10, 20, 22, 34, 38, 74 |
| | 12.6 | Cylinders and quadric surfaces | 12.6: 14, 18 |
| 6 | 13.1 | Vector functions and space curves | 13.1: 32, 42, 50 |
| | 13.2 | Derivatives and integrals of vector functions | 13.2: 24, 26, 36 |
| 7 | 13.3 | Arc length and curvature of space curve | 13.3: 4, 6, 24, 30 |
| | 13.4 | Velocity and acceleration | 13.4: 18 (a), 23, 24 |
| 8 | 14.1 | Functions of several variables | 14.1: 18, 30, 48 |
| | 14.2 | Limits and continuity | 14.2: 12, 14, 38 |
| 9 | 14.3 | Partial derivatives | 14.3: 50, 76 (d) (e) (f) |
| | 14.4 | Tangent planes and linear approximation | 14.4: 6, 16, 26. |
| 10 | 14.5 | Chain rule | 14.5: 8, 12, 34, 46 |
| | 14.6 | Directional derivatives and gradient vector | 14.6: 6, 32, 46. |
| 11 | 14.7 | Maximum and minimum values | 14.7: 20, 32, 36, 52 |
| 12 | 14.8 | Lagrange multipliers | 14.8: 1, 4, 6, 8, 16, 18, 32, 42 |
| 13 | | Review | |

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 a responsible behaviour (see also the **Academic Integrity and the Academic Code of Conduct** below), you will also achieve a better understanding of the material.

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: concordia.ca/students/academic-integrity." [*Undergraduate Calendar, Sec 17.10.2*]

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Disclaimer: In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in the course is subject to change.