Department of Mathematics & Statistics
Concordia University

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MATH 264 (MAST 218)
Advanced Calculus I
Winter 2021

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Instructor: Dr. A. Stancu
Email: alina.stancu@concordia.ca

Preface: **This course will be entirely ONLINE with the lectures organized on the Zoom platform. Course notes and any other material considered relevant by the course instructor, including course announcements and Zoom links, will be posted on moodle.**

Office Hours: The instructor will announce in class the hours when help will be available to discuss and clarify the material of the course. The office hours will also be held on Zoom. Note that, if a student misses a lecture, the instructor will not use office hours to make up for the student's missed class. Office hours are to clarify and better assimilate the material of the course that the student tried first to understand from the lecture or textbook in an individual study.

Text: *Multivariable Calculus*, 8th Edition by J. Stewart, Follett Canada.
The textbook will be available at:
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.

Prerequisites: Math 204 and 205 or equivalent.

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 and even solve similar additional problems.

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 recommended to install and use Mathematica or Maple. The software can be used to verify and illustrate analytical results you get while doing your assignment or other practice problems.

Calculators: Only calculators approved by the Department such as **SHARP EL-531** and the **CASIO FX-300MS** are to be used in the course's examinations. For the list of approved calculators see:
http://www.concordia.ca/artsci/math-stats/services.html#calculators

Evaluation: All tests are online. One midterm test covering the first six weeks will be given in week 8 during class time. **There is no make up for a missed test.** The final exam is two hours long, takes place online as mentioned above, and covers the entire course.

Final Grade: The highest of the following:
- 90% final exam, 10% assignments.
- 30% midterm, 10% assignments, and 60% final exam.

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.

The material of the course is outlined week by week in the table below:

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		**Review**	
		Midterm Evaluation	
9	14.1	Functions of several variables	**14.1: 18, 30, 48**
	14.2	Limits and continuity	**14.2: 12, 14, 38**
10	14.3	Partial derivatives	**14.3: 50, 76 (d) (e) (f)**
	14.4	Tangent planes and linear approximation	**14.4: 6, 16, 26.**
11	14.5	Chain rule	**14.5: 8, 12, 34, 46**
	14.6	Directional derivatives and gradient vector	**14.6: 6, 32, 46.**
12	14.7	Maximum and minimum values	**14.7: 20, 32, 36, 52**
13	14.8	Lagrange multipliers	**14.8: 1, 4, 6, 8, 16, 18, 32, 42**
		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]*

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.

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.

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.