MATH0009- Calculus and Vectors - Fall 2022

Instructor: Dr. Azita Montazeri
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Lectures: Wednesdays, Fridays 16:35-17:55- Nicole Building 4020.

Office hours: Fridays, 2-3pm.

Tutorial: Wednesdays , 11:35-12:25pm. Activities in tutorial includes solving problems, administering tests and answering questions. Attending tutorial is mandatory.

Prerequisites: Grade 12 Mathematics (Advanced Functions); or both MATH 0005 and MATH 0006; or permission of the School.

Text Book:

- Applied Calculus: For Business, Economics, and the Social and Life Sciences by L. Hoffmann, G. Bradley, D. Sobecki, M. Price, 11th edition
- Applied Calculus by S. Calaway, D. Hoffman and D. Lippman. The free online version is here . Solution to selected problems from textbook is posted on Brightspace page
- Algebra and Geometry, by Dunkley, Gilbert, Anderson, Crippin,Davidson, Rachich, and Zorzitto.
- Instructor's Notes on Brightspace

Marking Scheme: The course will be made up to four parts:

- 3 Tests ——— 30%
- 3 Assignments ——— 15%
- Final Exam ——— 55%

Tests: : There will be three 50-minute closed book tests on **Oct. 5, Nov. 2 and Nov.23**. These tests will be held during tutorials. There are no make-up tests.

Assignments: There will be 3 assignments with deadlines **Oct.2, Oct.31, Nov 20**

Final Exam: 3-hour closed book final examination to be held during the exam period (date and time TBA) covering the entire course.

Important Notes:

- If you miss the any test or assignment, you will receive a zero unless you provide me with a proper documented reason (e.g., medical), in which case the weight of the test will be shifted to the final exam.
- Selected exercises, mainly from the text, will be assigned for your practice. These exercises are not to be handed in and will not be graded. However, to succeed in the course it is absolutely essential that you do the exercises on a regular basis.

Conduct and Content Policies

- Violations of Carleton's Integrity Policy will be dealt with in a formal fashion. All suspected incidents will be forwarded to The Office of The Dean of Science. Students are expected to be familiar the Academic Integrity Policy.
- Plagiarism is a specific matter of Academic Integrity. Plagiarism includes reproducing or paraphrasing portions of someone else's published or unpublished material, regardless of the source, and presenting these as one's own without proper citation or reference to the original source. In mathematics, an answer can not be plagiarized, but the presentation of its solution can! Thus, copying answers from fellow students, online posts, or online calculators (such as Wolfram, Symbolab, etc.) is strictly prohibited.
- All classroom teaching and learning activities (lectures and tutorials), and online content is COPYRIGHTED. Students are encouraged to use the notes and download any and all course materials for their own educational use. However, students are NOT PERMITTED to post or share files externally, or distribute content in any way without permission.

Academic Accommodations:
Pregnancy obligation: Write me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see the Student Guide.

Religious obligation: Write me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see the Student Guide.

Students with disabilities: requiring academic accommodations in this course must register with the Paul Menton Centre for Students with Disabilities (PMC) for a formal evaluation of disability-related needs. Documented disabilities include but are not limited to mobility/physical impairments, specific Learning Disabilities (LD), psychiatric/psychological disabilities, sensory disabilities, Attention Deficit Hyperactivity Disorder (ADHD), and chronic medical conditions. Registered PMC students are required to contact the PMC every term to have a Letter of Accommodation sent to the Instructor by their Coordinator. In addition, students are expected to confirm their need for accommodation with the Instructor no later than two weeks before the first assignment is due or the first in-class test/midterm. If you require accommodations only for formally scheduled exam(s) in this course, you must request accommodations by the official accommodation deadline published on the PMC website.

Detailed Class Outline

DATES	TOPICS
Week 1	Basic Algebraic Operations Solving Equality and Inequality
Week 2	Functions and Graphs Factoring and Fractions and Quadratic Equations
Week 3	Exponentials and Logarithms Functions Inverse function, Exponential Growth and Decay
Week 4	Trigonometric Functions Limits, Evaluating Limits at Infinity
Week 5	Continuity, Introduction to the Derivative Basic Rules of Differentiation
Week 6	Product and Quotient Rules Marginal Analysis and Chain Rule
Week 7	Fall Break
Week 8	Implicit Rule Derivatives of Exponential and Logarithm Functions
Week 9	Increasing and Decreasing Functions Relative Extrema, Concavity and Curve Sketching
Week 10	Business and Economics Applications of the Derivative, Optimization Problems
Week 11	Introduction of Vectors and Vector Operations Dot and Cross Products, Projections
Week 12	Equations of Lines and Planes in 3 Dimensional Space Intersection points and distance between points, lines and planes
Week 13	Course Review

The above class outline is subject to change depending on the progress of the course.