MATH 1009 Calculus with Applications to Business
TENTATIVE OUTLINE FOR: Section A, Summer 2022

Instructor Mark Blenkinsop
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Office Hours To be announced. Any questions regarding tutorial, tests, assignments, or homework can be be directed to the TAs. (TA email addresses will be posted on BrightSpace).

Lectures Tuesday and Thursday 18:35 to 19:55 in 301 Azrieli Theatre. We will review key topics and go over examples from the notes. During these sessions, the emphasis will be on completing examples, not explaining definitions (and the like), so please come prepared, **BUT: Any and all of your questions are always welcome!**

Notes **Previous year's** notes and additional content will be posted on BrightSpace. The relevant portions must be reviewed prior to associated lectures - you will be notified!

Tutorials Monday 17:35 to 18:35 in 301 Azrieli Theatre (same room as lectures). TAs will present tutorials from the Tutorial Manual every week. The *Tutorial Compendium* is a highly recommended resource - it is a record of all possible tutorial questions, with full solutions, you can possibly be asked!

Assignments Assignments will due at regular intervals throughout the term. They will be posted at least for the full week in advance of the **DUE DATES**: TBD.

Exam #1 The first exam will be held during the mid-summer exam period.

Exam #2 The second exam will be held during the end-of-summer exam period.

Textbook *Mathematics for Business and Economics, 1st Edition (2021)*, by E. Devdariani, bluedoor (availability details TBA).

Tutorial Manual *The Tutorial Compendium for Calculus and its Applications, 1st Edition*, by Mark Blenkinsop, Prometheus Press (availability details TBA).

Grading

Tutorial Work:	15%
Assignments (3 in total, each worth 15%, hosted on cuLearn):	45%
Exam #1 (held during the June exam period):	20%
Exam #2 (held during the August exam period):	20%

Evaluation

• Scientific calculators and online calculators are permitted in this course, and it is worthwhile learning all functions they have to offer, however, direct copying of solutions of any kind is not permitted (see below - plagiarism).

• Tutorials are compulsory. They form one of the best opportunities for learning, and are an integral part of overall understanding, and preparation for tests and the final exam. The listed Tutorial Compendium is a proven reference for students: It is a record of all tutorial questions **and** solutions you may face throughout the term, and serves as an excellent study guide. Tutorial manuals will be available in various formats (details TBA).

• Tests and Homework Sets will be online, hosted on MyLab on specified dates. They will be accessible for a period of time; tests will be timed. Please note that these dates and times **may or may not** coincide with scheduled lectures or tutorials. If any of these are missed for valid reason, alternate arrangements will be made at the discretion of the Professor.

• Assignments are comprehensive: They are challenging, thorough, and encourage learning. You may seek outside assistance to solve problems, but direct copying of solutions of any kind is not permitted. Late submissions may be subject to penalty, at the discretion of the Professor. No assignments will be accepted once solutions are made public. Please note all submission details as they are announced.

• A 3-hour final examination will be held during the exam period, covering the entire course. The exam will be online, hosted on MyLab. E-proctoring software will **NOT BE USED**. The option of re-weighting any amount of the term towards the Final Exam is **NOT** available.

Conduct and Content Policies

• COVID has put stresses on many of us, and left many things uncertain. In particular, I, the Professor, have little kids, and they are obviously my priority. Please keep all of these kinds of factors in mind as we navigate through this course.

• TAs are here to help! Anyone seeking assistance solving homework problems, tutorial topics, or assignment questions are encouraged to ask their TA.

• The Professor, the TAs, and all students have the Right to Disconnect. None of us can expect 24/7 responses from anyone else. Only under certain circumstances would urgent matters be communicated, and they will be clearly marked.

• 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.

• **Copyright violation** is another specific matter of Academic Integrity. 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.

Accommodation Policies

• Students entitled to academic accommodations in this course must register with the Paul Menton Centre (PMC) for a formal evaluation, and have a Letter of Accommodation sent to the Professor by their Coordinator. Any such student must confirm their needs with the Professor before it can be applied to any evaluation element (test, assignment, exam, etc.).

• All other accommodations will be followed in accordance with University policy, and administered by the Office of Equity Services.

Generalized List of Topics for MATH 1009

Functions:
General functions, inverses, domains
Absolute functions
Trigonometric functions (**bonus topic; only counts for bonus marks**)
Logarithms and exponentials
Application: Compound interest

Limits:
Definitions, properties, theorems
Limits equal to infinity, limits towards infinity, indeterminant forms
Techniques of evaluating limits
Continuity

Differentiation:
Rules of differentiation
Derivative formulas
Tangent line, slope of the tangent line, equation of the tangent line
Implicit differentiation
Application: Cost, profit, margins

Curve sketching:
Intercepts, asymptotes, critical points, points of inflection
Max/min as the second derivative test
Increasing/decreasing segments of the domain
Concavity (segments of the domain)

Multivariable functions:
Definitions, partial derivatives
Lagrange multipliers

Integration:
Definite integrals, indefinite integrals
Fundamental Theorem of Calculus
List of anti-derivatives, integration by substitution
Application: Area between curves