

MATH 1009 A Summer 2014 Course Outline

Calculus with Applications to Business and Economics

Instructor: Zafer Selcuk Aygin

Office: 4250 HP

Email: zaferaygin@math.carleton.ca

Textbook: Elementary Calculus with Applications, by E. Devdariani.

Prerequisites: Ontario Grade 12 Mathematics: Advanced Functions and Introductory Calculus; or an OAC in Calculus; or MATH 0007; or equivalent.

Lectures: Tuesdays and Thursdays 18:35-19:55 in Tory Building Room 342

Tutorials:

A1: Days: Tuesday Time: 17:35 - 18:25 Building: Southam Hall Room: 518

A2: Days: Tuesday Time: 17:35 - 18:25 Building: Southam Hall Room: 402

Evaluation:

(1) Term Mark 45% (Best 3 out of 4 tests, each 15%.)

(2) Final Examination 55%.

Term Mark: There will be four 50-minute tests administered during tutorials on June 3, June 17, July 8 and July 29. No make up, early or delayed tests will be given. Students are allowed to miss one test without penalty as we only count the best 3 out of 4 tests. If you miss one test you do not need to show me any medical note. It is only in the rare case when a student misses more than one test due to illness (supported by a doctor's note), jury duty or extreme personal misfortune, that the term mark may be pro-rated. Best 3 tests out of 4 will be counted as 45%.

Final Exam: There will be a 3-hour exam scheduled during the usual exam period. It is the responsibility of each student to be available at the time of the final examination. In particular, no travel plans for the examination period in August should be made until the examination schedule is published. To pass this course, a student must obtain at least 50%.

Calculators: Only non-programmable calculators are allowed for tests and the final exam. I reserve the right to confiscate any calculator during a test or a final exam.

Homework: Students are expected to do every exercise from the textbook. These exercises are not to be handed in and will not be graded. However, in order to succeed in the course, it is absolutely essential to do the exercises on a regular basis.

List of topics:

Elementary Functions (Ch 1)

1.1. Definition, domain range. 1.2 Algebra of functions. 1.3 Transformation of graphs. 1.4 Polynomial, rational, power functions. 1.5 Exponential functions. 1.6 Logarithmic functions.

Limits (Ch 2)

2.1 The limit of a function at a point. 2.2 Properties of limits. 2.3 Limits at infinity. 2.4 Continuous functions. The Intermediate Value Theorem.

The Derivative and Rules of Differentiations (Ch 3)

3.1 The derivative as the rate of change and as the slope of the graph of a function. 3.2 Basic rules of differentiation. Power Rule. Product and Quotient Rules. Chain Rule. Implicit differentiation. 3.3. Higher order derivatives.

Applications of the Derivative (Ch 4)

4.1 Determining the intervals where a function is increasing/decreasing. 4.2 Marginal Concepts in Economics. 4.3 Elasticity of Demand. 4.4 Related Rates. 4.5 Maximum and minimum values. 4.6 Second derivative. 4.7 Curve sketching. 4.8 Optimization problems. 4.9 Exponential models (continuously compounded interest, exponential growth and decay, learning curves).

Functions of Several Variables (Ch 5)

5.1 Examples of Functions of Two and Three Variables. 5.2 Partial Derivatives. 5.3 Maxima and Minima of Functions of Two Variables. 5.4 Lagrange Multipliers. Constrained Optimization.

Integration (Ch 6)

6.1 Antiderivative. Basic rules of integration. 6.2 Integration by substitution. 6.3 The definite integral. 6.4 The Fundamental Theorem of Calculus. 6.5 Evaluation of definite integrals.

Academic Accommodation: You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

Pregnancy obligation: write to 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 to 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](#)

Academic Accommodations for Students with Disabilities: The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test/exam requiring accommodation. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the [PMC website](#) for the deadline to request accommodations for the formally-scheduled exams.