

BIT 1100 Mathematics I for IMD

Fall 2020 Course Outline

Last updated: August 28, 2020

Instructor: Dr. Jabir Abdulrahman

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Office hours: Tuesdays 1:00- 2:00pm.

Textbook: "Elementary Calculus with Applications", by E. Devdariani, any edition. The textbook is available at the Campus bookstore and at "Haven Books", 43 Seneca Street, (613) 730-9888. (5-minute walk from campus, two blocks from Bronson Avenue along Sunnyside Avenue.)

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

Lectures:

begin on September 9 (Wednesday), then every Monday and Wednesday 10:05 - 11:25 am. Lectures end on Friday, December 11.

Tutorials:

begin on September 21, Monday, 11:35 - 12:25 pm;. On the tutorial sessions the students are expected to work and participate on specific problems. A Teaching Assistant (TA) will be present, to answer questions.

Evaluation:

(1) Term Mark 40% (2 best tests out of 3);

(2) Final Examination 60%.

NOTE: 100% exam evaluation option is allowed ONLY to those who wrote at least 2 tests; the maximum of the combined 40/60 and the exam out of 100 is then assigned as the final grade.

Term mark : There will be three tests in the regular tutorial hours on the following dates: October 5, November 2, and November 23. Students are expected to take all three tests. The best two will be counted. **There will be NO make-up tests as we do not have the resources to provide such tests. This lack of the resources for make-up tests is the reason why the students are allowed to miss one test without penalty. The instructor reserves the right not to answer the individual emails concerning make-up tests.** In case when a student misses more than one test due to illness (supported by a doctor note) jury duty or extreme personal misfortune, the term mark may be pro-rated.

Final Examination: This is a 3-hour exam scheduled by the University. The exam is taking place during the period of December 12 to 23 (including weekends), 2020. It is each student's responsibility to be available at the time of the examination. In particular, no travel plans should be made until the examination schedule is published. It is each student's responsibility to find out the correct date and time of the exam and the room where it takes place. Please remember that we do not change grades on the basis of students' needs (such as scholarships, etc.). To pass this course, a student must obtain at least 50% of total and at least 30% of the final exam mark. Students who missed the examination may be eligible for a deferred exam, provided that they present a doctor note or another supporting document to the Registrars Office. It is the Registrars Office (not the course Instructor!) which makes the decision of granting a deferred examination. After the deferred exam is written, all questions should be directed to the School of Mathematics and Statistics and not to the Instructor.

Calculators: Non- programmable calculators are allowed for tests and the 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.

Academic Accommodation: You may need special arrangements to meet your academic obligations during the term because of disability, pregnancy or religious obligations. You can visit the Equity Services web site to view the policies and to obtain more detailed information on academic accommodation at <http://carleton.ca/equity/accommodation>. The university has a COVID-19 FAQ with questions related to academics. If you haven't done so, please review the information on the FAQ at <https://newsroom.carleton.ca/coronavirus-covid-19/faq>

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 or exam requiring accommodation (if applicable). Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam.

Mathematics I for IMD:

BIT 1100 [0.5 credit]

Tailored for students in the Interactive Multimedia Design program, this course covers basic concepts in functions (polynomials, exponential, logarithmic) and introduces concepts of limits, derivatives and rules of differentiation, applications of differentiation (max-min problems, curve sketching) and integration. Includes: Experiential Learning Activity Precludes additional credit for

BIT 1000; <https://calendar.carleton.ca/search/>

1200; <https://calendar.carleton.ca/search/>

1401; <https://calendar.carleton.ca/search/>

1402; <https://calendar.carleton.ca/search/>

1004; <https://calendar.carleton.ca/search/>

1007; <https://calendar.carleton.ca/search/>

1009; <https://calendar.carleton.ca/search/>

Prerequisite(s): restricted to students in the B.I.T. degree program. Lectures three hours a week, tutorial/laboratory one hour a week.

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. 4.5 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).

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.

Trigonometry (Appendix, will be posted on CULearn)

1. Definition, domain and range of trigonometric functions. 2. Some trigonometric identities

and formulae. 3. Differentiation of trigonometric functions. 4. Integration of trigonometric functions.