



THE UNIVERSITY OF BRITISH COLUMBIA

Department of Computer Science, Mathematics, Physics and Statistics
Okanagan Campus

MATH 116 - 101

Calculus I for Management and Economics

Winter 2020 – Term 2

Course Information

Instructor: Dr. Paul Tsopmene

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Classroom Schedule: Monday: 1:00 PM – 2:00 PM, Tuesday: 4:00 PM – 5:00 PM, Friday: 9:30 AM – 10:30 AM

Location: On-line through Zoom. Here are the Zoom links:

- Mondays: <https://ubc.zoom.us/j/67623524167?pwd=M2w0eGJDWVZpeXdPQWgvU1BkR01jQT09>
- Tuesdays: <https://ubc.zoom.us/j/65913961984?pwd=dmhlVXMvb3p3aCtDSIFVMk9XeTVodz09>
- Fridays: <https://ubc.zoom.us/j/65264866790?pwd=R2MvNmQ2V2g0Uk9IMHB5T1NEeGFjdz09>

Office Hours: Monday and Wednesday: 4:00 PM – 6:00 PM. These will be conducted on Zoom. Here is the link: <https://ubc.zoom.us/j/65610648089?pwd=U1kvOGpmNjlxRHINCjRkVWxoanI1UT09>

I am also available by appointment if these times do not work for you.

Course Website: Course material on our [Canvas](#) learning management system. My primary method of communication is through Canvas messages/emails. Make sure you check this website regularly.

Teaching Assistants: Ruichao Jiang (jiangruichao.ok@gmail.com), Ziyuan Wang (ziyuan.wang@alumni.ubc.ca), Javier Perez Tobia (javierperezobia@gmail.com), and Olivia Marleau (oliviamarleau98@hotmail.com)

Course Description

MATH 116 (3) Calculus I for Management and Economics

The derivative; limits; rate of change; derivatives of algebraic, logarithmic, trigonometric and exponential functions; applications to marginal analysis; elasticity of demand; optimization and curve-sketching, Newtons Method and Taylor polynomials. Credit will be granted for only one of MATH 116 or MATH 100. [3-0-1]

Prerequisite: Either (a) a score of 67% or higher in one of MATH 12, PREC 12 or (b) a score of 60% or higher in one of MATH 125, MATH 126.

Equivalency: MATH 100.

Required Materials

Textbook: *Calculus with Applications*, by Margaret L. Lial, Raymond N. Greenwell, and Nathan P. Ritchey, 11th edition, Pearson.

Calculators: The use of a scientific calculator (non-graphing, non-programmable) is permitted.

Course Objectives

To enable the student to

- Understand the fundamental concepts of differential calculus and applications to marginal analysis, and elasticity of demand;
- Learn the most important techniques for calculating derivatives;
- practice how to apply these techniques to model and solve various problems.

Topics include

- **Linear Functions:** Slopes, Equations of Lines and Applications.
- **Nonlinear Functions:** Quadratic, Exponential and Logarithmic Functions.
- **The Derivative:** Limits, Continuity, Rates of Change, Definition of the Derivative, and Graphical Differentiation.
- **Calculating the Derivative:** Techniques for Finding Derivatives, Product, Quotient, and Chain Rules Derivatives of Exponential and Logarithmic Functions.
- **Graphs and the Derivative:** Increasing and Decreasing Functions, Relative Extrema, Concavity, the Second Derivative Test, and Curve Sketching.
- **Applications of the Derivative:** Absolute Extrema, Optimization, Elasticity of Demand, Implicit Differentiation, and Related Rates.
- **Sequences and Series:** Taylor Polynomials at 0 and Newton's Method.

Course Details

This course is being offered in an online format only. You must have all of the following items to participate in this course:

1. A working laptop or desktop computer;
2. A working microphone;
3. A working webcam – external or integrated;
4. A working smartphone or similar device capable of taking a Zoom call and uploading files to Canvas;
5. A tripod or other type of apparatus you can use to put your smartphone or secondary device in a variety of positions;
6. A stable internet connection with enough bandwidth to be connected to Zoom and Canvas simultaneously.

The lectures will be delivered synchronously, and will be recorded and posted on Canvas. So, if you can't attend



live, you can watch the lecture later. Even though we are doing this remotely, questions are highly encouraged during lecture! Please feel free to ask whatever questions you like in the chat or aloud.

This course uses Respondus Lockdown Browser and Zoom for invigilation of the midterms and final exam. These tools are chosen in order to address accreditation requirements and maintain academic integrity for tracking academic progress of individual students. **More information can be found in the document titled “ONLINE TEST INFORMATION”, which is posted on Canvas.**

Evaluation

The final grade will be based on the following:

- **Assignments** -----15%
- **Midterm 1** ----- 17.5%
- **Midterm 2** -----17.5%
- **Final Exam** -----50%

NOTE:

- **You MUST attain a grade of at least 50% on the Final Exam in order to pass the course.** In the event you do not get at least 50% on the final exam AND your final grade is less than 50%, your final grade will be recorded. In the event you do not attain at least 50% on the final exam AND your final grade is greater than or equal to 50%, a maximum grade of 49% will be recorded.
- The final exam will be given during the regularly scheduled examination period (April 16 – 29, 2021).
- **To pass the course,** you must attain a grade of at least 50% on the final exam AND your final grade has to be greater than or equal to 50%.

Practice Problems, Assignments, Midterms, and Final Exams

- **Practice Problems:** Every week I will post practice problems on Canvas along with complete solutions. While completion of these problems is essential for your success in this course, **you do not hand them in for grading.**
- **Assignments:** There will be 6 assignments throughout the semester. These will be posted on Canvas on Fridays and the due date will be on the next Friday at 11:59 PM. **To submit your assignment, you will have to upload the assignment as a single .pdf file to Canvas. Late submissions won't be considered.** Your worst assignment grade will be dropped from the total.



Assignment #	Will be posted on	Due date
1	January 22	January 29
2	January 29	February 5
3	February 5	February 12
4	March 5	March 12
5	March 12	March 19
6	April 2	April 9

- Midterms:** There will be 2 midterm exams (40 minutes each).
Midterm 1: Friday, February 26
Midterm 2: Friday, March 26
 I will send you the midterm topics by email one week before the date of each midterm. The midterms will be written during the class time. **No make-up midterms will be given. If a midterm is missed for a valid reason (e.g., religious, medical or compassionate reasons, with documentation), the final exam will be weighted more heavily to compensate.**
- Final Exam:** There is a 2.5-hours comprehensive final exam during the final examination period April 16 – 29. **Date: TBA. You MUST attain a grade of at least 50% on the final exam in order to pass the course.**

Important Dates

Monday, January 11	Term 2 of Winter 2020 semester starts
Friday, January 22	Last day for withdrawal without receiving a “W” standing
Monday, February 15	Family Day, university closed
Tuesday, February 16	Winter session term 2 reading break starts (February 16 – 19)
Friday, March 26	Last day for withdrawal with a “W” standing
Friday, April 2	Good Friday, university closed
Tuesday, April 13	Last day of classes
April 16 – 29	Final Exams

*** Course schedule on next page ***



Course Schedule

This is subject to change

Lecture Week	Subject, Assignments, and Midterms
Jan. 11 - 15	Introduction to Calculus, Slopes, Equations of Lines, Linear Functions and Applications
Jan. 18 - 22	Quadratic Functions and Exponential Functions January 22: Release Assignment 1
Jan. 25 - 29	Logarithmic Functions and Limits January 29: Release Assignment 2
Feb. 1 - 5	Limits February 5: Release Assignment 3
Feb. 8 - 12	Continuity, Rates of Change, and Definition of the Derivative
Feb. 15 - 19	Winter Break (no classes)
Feb. 22 - 26	Graphical Differentiation and Techniques for Finding Derivatives Friday, February 26: Midterm 1
Mar. 1 - 5	Product Rule, Quotient Rule, and The Chain Rule March 5: Release Assignment 4
Mar. 8 - 12	Derivatives of Exponential and Logarithmic Functions, Increasing and Decreasing Functions March 12: Release Assignment 5
Mar. 15 - 19	Relative Extrema, Concavity and The Second Derivative Test
Mar. 22 - 26	Curve Sketching and Absolute Extrema Friday, March 26: Midterm 2
Mar. 29 – April 2	Optimization and Elasticity of Demand April 2: Release Assignment 6
April 5 - 9	Implicit Differentiation, Related Rates, and Taylor Polynomials at 0
April 12 - 13	Newton's Method



Grading Practices

Faculties, departments, and schools reserve the right to scale grades in order to maintain equity among sections and conformity to University, faculty, department, or school norms. Students should therefore note that an unofficial grade given by an instructor might be changed by the faculty, department, or school. Grades are not official until they appear on a student's academic record.

<http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,41,90,1014>

Final Examinations

The examination period for **W2020 T-2 is April 16 - 29, 2021**. Except in the case of examination clashes and hardships (three or more formal examinations scheduled within a 24-hour period) or unforeseen events, students will be permitted to apply for out-of-time final examinations only if they are representing the University, the province, or the country in a competition or performance; serving in the Canadian military; observing a religious rite; working to support themselves or their family; or caring for a family member. Unforeseen events include (but may not be limited to) the following: ill health or other personal challenges that arise during a term and changes in the requirements of an ongoing job.

Further information on **Academic Concession** can be found under **Policies and Regulation in the Okanagan Academic Calendar** <http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,48,0,0>

Academic Integrity

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences.

A more detailed description of academic integrity, including the University's policies and procedures, may be found in the Academic Calendar at: <http://okanagan.students.ubc.ca/calendar/index.cfm?tree=3,54,111,0>.



Cooperation vs. Cheating

Working with others on assignments is a good way to learn the material and we encourage it. However, there are limits to the degree of cooperation that we will permit. Any level of cooperation beyond what is permitted is considered cheating.

When working on programming assignments, you must work only with others whose understanding of the material is approximately equal to yours. In this situation, working together to find a good approach for solving a programming problem is cooperation; listening while someone dictates a solution is cheating. You must limit collaboration to a high-level discussion of solution strategies, and stop short of actually writing down a group answer. Anything that you hand in, whether it is a written problem or a computer program, must be written by you, from scratch, in your own words. If you base your solution on any other written solution, you are cheating. If you provide your solution for others to use, you are also cheating.

Copyright Disclaimer

Diagrams and figures included in lecture presentations adhere to Copyright Guidelines for UBC Faculty, Staff and Students <http://copyright.ubc.ca/requirements/copyright-guidelines/> and UBC Fair Dealing Requirements for Faculty and Staff <http://copyright.ubc.ca/requirements/fair-dealing/>. Some of these figures and images are subject to copyright and will not be posted to **Canvas**. All material uploaded to **Canvas** that contain diagrams and figures are used with permission of the publisher; are in the public domain; are licensed by Creative Commons; meet the permitted terms of use of UBC's library license agreements for electronic items; and/or adhere to the UBC Fair Dealing Requirements for Faculty and Staff. Access to the **Canvas** course site is limited to students currently registered in this course. Under no circumstance are students permitted to provide any other person with means to access this material. Anyone violating these restrictions may be subject to legal action. Permission to electronically record any course materials must be granted by the instructor. Distribution of this material to a third party is forbidden.

Grievances and Complaints Procedures

A student who has a complaint related to this course should follow the procedures summarized below:

- The student should attempt to resolve the matter with the instructor first. Students may talk first to someone other than the instructor if they do not feel, for whatever reason, that they can directly approach the instructor.
- If the complaint is not resolved to the student's satisfaction, the student should e-mail the Associate Head, Dr. Heinz Bauschke at heinz.bauschke@ubc.ca or the Department Head, Dr. John Braun at john.braun@ubc.ca

Student Service Resources

Disability Assistance

The Disability Resource Centre ensures educational equity for students with disabilities, injuries or illness. If you are disabled, have an injury or illness and require academic accommodations to meet the course objectives, e-mail us or visit our website for more information.

Web: <http://students.ok.ubc.ca/drc/welcome.html> **E-mail** DRC at: drc.questions@ubc.ca



Equity, Human Rights, Discrimination and Harassment

UBC Okanagan is a place where every student, staff and faculty member should be able to study and work in an environment that is free from human rights-based discrimination and harassment. If you require assistance related to an issue of equity, discrimination or harassment, please contact the Equity Office, your administrative head of unit, and/or your unit's equity representative. **UBC Okanagan Equity Advisor: ph. 250-807-9291**

Web: <https://equity.ok.ubc.ca/>

E-mail: equity.ubco@ubc.ca

Health & Wellness - UNC 337

At UBC Okanagan health services to students are provided by Health and Wellness. Nurses, physicians and counsellors provide health care and counselling related to physical health, emotional/mental health and sexual/reproductive health concerns. As well, health promotion, education and research activities are provided to the campus community. If you require assistance with your health, please contact Health and Wellness for more information or to book an appointment.

Web: www.students.ok.ubc.ca/health-wellness

Email: healthwellness.okanagan@ubc.ca

Sexual Violence Prevention and Response Office (SVPRO)

A safe and confidential place for UBC students, staff and faculty who have experienced sexual violence regardless of when or where it took place. Just want to talk? We are here to listen and help you explore your options. We can help you find a safe place to stay, explain your reporting options (UBC or police), accompany you to the hospital, or support you with academic accommodations. You have the right to choose what happens next. We support your decision, whatever you decide. Visit svpro.ok.ubc.ca or call us at 250-807-9640

Independent Investigations Office (IIO)

If you or someone you know has experienced sexual assault or some other form of sexual misconduct by a UBC community member and you want the Independent Investigations Office (IIO) at UBC to investigate, please contact the IIO. Investigations are conducted in a trauma informed, confidential and respectful manner in accordance with the principles of procedural fairness. You can report your experience directly to the IIO by calling 604-827-2060.

Web: <https://investigationoffice.ubc.ca/>

E-mail: director.of.investigations@ubc.ca

The Hub

The Student Learning Hub (LIB 237) is your go-to resource for free math, science, writing, and language learning support. The Hub welcomes undergraduate students from all disciplines and year levels to access a range of supports that include **tutoring in math, sciences, languages, and writing, as well as help with study skills and learning strategies.** **Web:** (<https://students.ok.ubc.ca/student-learning-hub/>) **Ph:** 250-807-9185.

SAFEWALK - Download the UBC SAFE – Okanagan app.

Don't want to walk alone at night? Not too sure how to get somewhere on campus?

Call Safewalk at 250-807-8076 For more information: <https://security.ok.ubc.ca/safewalk/>