

Syllabus for Math 1100-003

Business Calculus

Fall 2020

General Course Information:

Course: Math 1100 - Business Calculus.

Instructor: Keyvan Yaghmayi.

Email: yaghmayi@math.utah.edu.

Office: JWB 104.

Course Website: We use Canvas: <https://gate.acs.utah.edu/>. To log in, use the same student ID and password that you use for Campus Information System.

Class Time: Tuesdays and Thursdays 6:00pm - 7:30pm.

Class Location: Online lectures in Canvas via Zoom.

Course Type: The class type is listed as an “IVC” in the university catalog, which stands for “Interactive Video Conferencing”. This means that the class will be delivered synchronously, i.e. live and at the time listed but entirely online.

Office Hours: I will hold online office hours via Zoom in Canvas. Mondays 10:00am - 11:00am and Thursdays 12:30pm - 1:30pm, or by appointment. The Zoom link is available in Canvas.

Textbook: Mathematical Applications for the Management, Life and Social Sciences, 12th Edition, by Harshbarger and Reynolds, ISBN 13: 978-1-337-62534-0. E-textbook is available in Canvas (click on Bookshelf tab). Please read “Textbook Information” file on Canvas or visit

<http://www.math.utah.edu/schedule/bookInfo/Math1100BookInfo.pdf>

for further information, in particular, if you want to buy hard copy of the text or if you want to opt out of electronic access.

Important Dates: Classes begin Monday, August 24. The last day to add, drop (delete), elect CR/NC, or audit the class is Friday, September 4. The last day to withdraw is Friday, October 16. Last day to reverse CR/NC option is Friday, November 27. *Final Exam* is on Tuesday, December 8, 6:00pm - 8:00pm, in Canvas.

Technical requirements: For both quality learning and proctored testing, students are required to have access to the following equipment:

- A strong internet connection with sufficient bandwidth (in order to participate in online classes, access course materials, and take exams)
- A webcam on your computer or camera on your phone (this is required for taking exams in Zoom; it is recommended for IVC lecture classes)
- A scanning device which is different than the device you are using for your webcam (smartphones can be used as scanning devices)
- a microphone (used for online meetings)

Note: The Marriott library is loaning laptops to students. They are also offering off-campus internet access. Please visit <https://lib.utah.edu/coronavirus/checkout-equipment.php>

Essential Course Information:

Prerequisites: At least a “C” grade in Math 1090 (Business Algebra) OR Math 1050 (College Algebra) OR in Math 1080 (Precalculus) OR Math 1210 (Calculus I) OR an Accuplacer score of 80 on the College Level Math (CLM) test OR at least an ACT Math score of 28 OR at least SAT Math score of 630.

Important Note: The mathematics department DOES enforce prerequisites for all undergraduate courses. If you were able to register for this class based on your enrollment in the prerequisite course last semester and you did not receive the minimum grade in that course to enter this class, then you will be dropped from this class on Friday of the first week of classes. If you are in this situation, it is in your best interest to drop yourself from this class and enroll in a class for which you have the prerequisites before you are forcibly dropped.

Course Information: Math 1100, Business Calculus, is a 3-credit semester course.

Course Description: Introduction to limits. Differentiation and integration of polynomial, rational, logarithmic and exponential function. Optimization of functions, including business applications such as marginal analysis. Business applications of the derivative and integral. Brief exposure to partial derivatives and functions of several variables. (Not for students who have completed more than one semester of calculus).

The Course Goal: The course goal is for students to improve their quantitative reasoning, gaining an understanding of the themes of calculus and how they relate to business and economics. My goal, as an instructor, is to provide a well-structured course in which each student is successful, enjoys the learning experience, and gains skill and confidence in logical reasoning.

Expected Learning Outcomes: Upon successful completion of this course, a student should be able to:

1. Have a basic conceptual understanding of limits.
2. Know how to differentiate and integrate polynomial, rational, logarithmic, and exponential functions.
3. Use derivatives to gather information about the shape of the curve and use that information to graph the curve $y = f(x)$, for polynomial, logarithmic, exponential and simple rational functions.
4. Understand how to use differentiation to optimize functions for business applications, such as maximizing profit examples.
5. Use integration to find area under curves and for business examples such as average value.
6. Take partial derivatives of basic functions of two variables.

We will cover the following Chapters/Sections of the textbook:

- **Chapter 9 (*Sections 9.1-9.9*):** Limits, Continuous Functions, Average and Instantaneous Rates of Change: The Derivative, Derivative Formulas, Product and Quotient Rules, Chain Rule, Power Rule, Higher-Order Derivatives, Applications of Derivatives in Business and Economics.
- **Chapter 10 (*Sections 10.1-10.5*):** Relative Maxima and Minima, Curve Sketching, Concavity, Points of Inflection, Second-Derivative Test, Optimization in Business and Economics: Maximizing Revenue, Minimizing Average Cost, Maximizing Profit, Applications of Maxima and Minima, Rational Functions and Asymptotes.
- **Chapter 11 (*Sections 11.1-11.5*):** Derivatives of Logarithmic and Exponential Functions, Implicit Differentiation, Related Rates, Applications in Business and Economics: Elasticity of Demand, Taxation in a Competitive Market.
- **Chapter 12 (*Sections 12.1-12.4*):** The Indefinite Integral, The Power Rule, Integrals Involving Exponential and Logarithmic Functions, Applications of the Indefinite Integral in Business and Economics: Total Cost and Profit, National Consumption and Savings.
- **Chapter 13: Sections 13.1-13.4 & 13.7** Area Under a Curve, The Definite Integral, The Fundamental Theorem of Calculus, Area Between Two Curves, Applications of Definite Integrals in Business and Economics: Continuous Income Streams, Consumer's Surplus, Producer's Surplus, Improper Integrals and Their Applications.
- **Chapter 14: Sections 14.1 & 14.2** Functions of Two or More Variables, Partial Differentiation.

Modules: To be organized, I will create “Modules” in Canvas for every week. The module is going to have four parts: (1) class notes (2) lecture videos (3) announcements and discussions (4) homework assignments and quizzes (and exams).

Homework:

Homework problems and due dates will be posted on Canvas regularly. The problems will be taken from the book. You should write them on paper, scan and create a single PDF file of your work, then upload into Canvas. Please scan and don't take photo. You don't need a scanner; there are directions in Canvas for using your smart phone as scanner. Scanning is easier and faster than taking pictures. The quality is higher than pictures too.

I encourage you to discuss your homework problems with one another, ask help from tutors in the *online math center* (see below), or talk to me during online office hours. The other way that you can get help with homework assignments (and quizzes) is posting discussions in Canvas.

I will drop your lowest homework score at the end of the semester. Your homework assignments will be graded in Canvas.

Quizzes:

We will have take-home (group) quizzes on the material that already has been taught and covered by homework assignments. I will make quizzes available by Tuesdays 11:59pm and they are due Fridays at 11:59pm. You print, answer questions, scan and upload the PDF file into Canvas (there are directions on Canvas for those who don't have access to printer and/or scanner). There will be 2-3 questions in every quiz. Your quizzes will be graded in Gradescope.

You are encouraged to work on quizzes within small groups of 3 or 4 via Zoom. You would discuss your possible solutions within the group and then write your answer based on your own understanding. Working in groups is encouraged, but it is “individual responsibility” to complete and submit quizzes. Everyone writes only his/her name on the quiz paper. At the end of the semester, I will drop your lowest quiz score.

Tests:

There will be two midterms along with a “comprehensive” final exam. All exams are during class time. I will provide you exam file in Canvas and proctor you through the Zoom.

Midterm One: Thursday, Oct. 1st, 6:00pm - 7:30pm, on Material from Weeks 1-5
Midterm Two: Thursday, Nov. 5th, 6:00pm - 7:30pm, on Material from Weeks 6-10
Final Exam: Tuesday, Dec. 8th, 6:00pm - 8:00pm, comprehensive

It is essential that you show all your work. Credit will not be given without the proper work and partial credit will be awarded if you show correct steps even if you do not obtain the final correct number.

Grading:

The grades will be calculated as follows:

Homework 20%
Quizzes 20%
Midterm 20%
Midterm 20%
Final Exam 20%

The grade scale will be the usual: A (93-100), A- (90-92), B+ (87-89), B (83-86), B- (80-82), C+ (77-79), C (73-76), C- (70-72), D+ (67-69), D (63-66), D- (60-62), E (0-59). If I do need to curve the grades, I will simply shift your overall percentage up by a few points (whatever is necessary).

Note: It is the student's responsibility to ensure the accuracy of all recorded homework, quizzes, online assignments, and exam grades. Also you should keep as record all your graded assignments. If you see any error in your grades on Canvas reach out to me as soon as possible. If you have questions or see an error in Gradescope, for example if the feedback doesn't match the work you show, go to the problem and submit a regrade request. Please take action promptly, at the latest within two weeks from when the assignment was returned.

Some Policies and Comments:

- Please check Canvas regularly (every day or every other day). I will use the following features of Canvas frequently: Pages, Assignments, Zoom, Announcements, Modules, Discussions, Gradescope, Files, and Grades.
- For homework assignments, quizzes and exams, you are allowed to use a "scientific calculator". Other types of calculators like programmable calculators or graphing calculators are not allowed. I will make tests and quizzes to evaluate your mathematical skills and not your calculator skills.

- Online attendance to live lectures is strongly encouraged but not required. Class lectures will be recorded and posted in Canvas.
- All materials for this course are copyrighted. Do not distribute or share course resources without instructor permission.
- **Late and Missing Assignments Policy:** The course is designed to provide flexibility in the case of a few times. But in general, you are expected to turn things in on time and take quizzes and exams at the times given. If there are extenuating circumstances, please contact me in a timely way to discuss alternatives. If the situation is one that can be documented, you may be asked to provide documentation. The University of Utah student code allows for making up quizzes or exams in advance for “officially sanctioned University activities ..., or government obligations, or religious obligations”. Please contact me at least one week in advance of any such obligations to arrange accommodation.
- Past semesters, with take-home quizzes and online exams, there was an increase in instances of cheating and other types of academic misconduct. Many online tutoring and video hosting sites, as part of their terms of service, are authorized to fully cooperate with investigations involving academic integrity. All cases involving cheating will be handled according to standard protocols in the Code of Student Rights and Responsibilities. See Policy 6-400 <http://regulations.utah.edu/academics/6-400.php>.
- If there is something that I want to inform you, I will reach out to you by emailing you through Canvas. That is usually your default UMail address (uNID@utah.edu) that you have in the CIS. If you are using other emails more frequently than your UMail, then you can set your UMail to forward to your preferred email address. Also the fastest way to reach me is my email: yaghamayi@math.utah.edu.
- If your preferred name is different than your legal first name (the preferred name you chose does indeed show up in CIS on my roll sheet, but not yet in Canvas), please log into Canvas and go to “Account” (on far left) then “Settings” and change your “Display Name” to be the name you prefer to be addressed by. This will help me greatly to know students’ names, and to address you correctly when responding to Canvas comments.
- If you have any thoughts, ideas, or suggestion, please feel free to contact me. I promise to do everything in my power to help.

Tutoring and Extra Help:

- **Tutoring Lab:** The online math tutoring center is available free of charge to all university students. The tutoring center is open Monday-Thursday 8:00am-8:00pm, and Friday 8:00am-6:00pm. Please take advantage of the tutoring center as needed throughout the semester. Their website is: <http://www.math.utah.edu/ugrad/tutoring.html>
- **ASUU Tutoring Center:** University Tutoring Services, 330 SSB. They offer inexpensive (online) tutoring, please see their website: <http://tutoringcenter.utah.edu>
- **Khan Academy:** It is a non-profit, free, educational organization for anyone, anywhere. They have some amazing videos in the Youtube. If you're interested, check out: <https://www.khanacademy.org/>

COVID-19 Considerations:

- Generally, on-campus, all of us should wear a face covering mask and we should also maintain a 6 ft. distance between ourselves while using community rooms and common areas in buildings.
- We must self-report if we test positive for COVID-19 via <https://coronavirus.utah.edu/>.
- Fall break was originally scheduled to run October 4th - October 11th, but has since been canceled. There is no "Fall Break" this semester.
- All classes will be online during
 - Two weeks from Sunday, September 27th to Sunday, October 11th
 - After Thanksgiving, Monday, November 30th until the last day of classes on Friday, December 3rd

The delivery and schedule for this course will remain the same during these periods.

University of Utah Resources and Policies:

- **Campus Safety:** The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call

campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit <https://safeu.utah.edu/>.

- **Student Responsibilities:** All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. You have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, collusion, fraud, theft, etc. Students should read the Code carefully and know you are responsible for the content. According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, beginning with verbal warnings and progressing to dismissal from class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee. <http://regulations.utah.edu/academics/6-400.php>
- **Addressing Sexual Misconduct:** Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veterans status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).
- **Student Names and Personal Pronouns:** Class rosters are provided to the instructor with the students legal name as well as preferred first name (if previously entered by you in the Student Profile section of your CIS account). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class, on papers, exams, group projects, etc. Please advise me of any name or pronoun changes (and update CIS) so I can help create a learning environment in which you, your name, and your pronoun will be respected. If you need assistance getting your preferred name on your U-ID card, please visit the LGBT Resource Center Room 409 in the Olpin Union Building, or email bpeacock@sa.utah.edu to schedule a time to drop by. The LGBT Resource Center hours are M-F 8am-5pm, and 8am-6pm on Tuesdays.
- **Wellness Statement:** Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student's ability to succeed and thrive at the University of Utah. For helpful resources contact

the Center for Student Wellness at <https://wellness.utah.edu/> or 801-581-7776.

- **Center for Disability & Access:** is dedicated to students with disabilities by providing the opportunity for success and equal access at the University of Utah. They are committed to providing reasonable accommodations as outlined by Federal and State law. The Center for Disability & Access (CDA) also strive to create an inclusive, safe and respectful environment. By promoting awareness, knowledge and equity, they aspire to impact positive change within individuals and the campus community. Please visit <http://disability.utah.edu/> for the latest information.
- **A.D.A. Statement:** The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability & Access, 162 Olpin Union Building, 801-581-5020. CDA will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability & Access.
- **Women's Resource Center:** The Womens Resource Center (WRC) at the University of Utah serves as the central resource for educational and support services for women. Honoring the complexities of womens identities, the WRC facilitates choices and changes through programs, counseling, and training grounded in a commitment to advance social justice and equality. <https://womenscenter.utah.edu/>
- **Veterans Support Center:** The Center is staffed by student Veterans who are committed to providing their fellow Veterans with the most useful and current information available. The Mission of the Veteran Support Center is to improve and enhance the success of student Veterans; to help them receive the benefits they deserve; to serve as a liaison between the Veteran student community and the University; and to increase their academic success. Additionally to provide an opportunity to continue the relationships built through the service in civilian life. Please see <https://veteranscenter.utah.edu/>

Disclaimer: This syllabus is meant to serve as an outline and guide for our course. All information on this syllabus is subject to change. If any changes on this syllabus, course policies or course outline arise throughout the semester, then I will announce it in class and post it on Canvas.