MATH 108-007   Introductory Calculus with Business Applications   Fall 2020
W 5:55pm - 8:35pm, 3 credit hours, Synchronous GMU Online Class Meetings

Instructor: Dr. Sam Ferguson

Email: sfergus@gmu.edu

Office Hours: W 8:45pm - 10:45pm, usually accessed via emailed Zoom link, subject to change

Text and Materials: *Pearson MyMathLab access and access code—to be purchased—-and MyLab system—which comes with the eText—accessible via our course Blackboard page. *Calculus for Business, Economics, Life Sciences, and Social Sciences, *Fourteenth Edition*, by Barnett, Ziegler, Byleen, and Stocker. Published by Pearson, 2019. The eText version is fine. *See "Required Access to Pearson's MyLab," "Access to Pearson's MyLab," and "Required Technologies" on the last page of this syllabus for more info on access and tech requirements. *You may need a scientific calculator for homework assignments and exams. Any calculator that does arithmetic and exponential calculations is acceptable.

Course Description: This course meets the quantitative reasoning requirement, one of the foundation requirements of the Mason Core. We will cover the following topics:

- Functions
- Limits
- Derivatives
- Integrals
- Business Applications

Student Expectations:
- *Attendance.* Classes meet online, and you are expected to either attend or view videos corresponding to each class. If you attend, you are to attempt any in-class exercises.
- *Preparation.* You are expected to be prepared for class. The preparation includes reading and learning material from the textbook, as well as doing homework and any review questions. There may be videos accessed via MyLab, Blackboard, or links in emails that can be used for review or reinforcement. Please check your GMU email daily for course updates. I also suggest looking at the Math 108-007 Blackboard page and your GMU email an additional time right before each class, to check for announcements or changes.
- *Collaboration.* You may collaborate and help fellow students as you judge appropriate for any in-class exercises. However, keep in mind that graded homework and exams do not allow for collaboration. Exams are individual efforts and sharing information about them is prohibited. Ask if you're unsure whether collaboration is permitted on some item.

Exam Dates: **Midterm Exam 1** Wednesday, September 16, take-home, in Pearson MyLab
                  Midterm Exam 2 Wednesday, October 21, take-home, in Pearson MyLab
                  Midterm Exam 3 Wednesday, November 18, take-home, in Pearson MyLab
                  Final Exam Wednesday, December 2, take-home, in Pearson MyLab

Homework Due Dates: Note that reading the relevant sections of the text is part of each homework assignment. Also, you may be required to complete some review material on Pearson before you can attempt each homework. We will use Pearson's MyLab for all homework.

Homework 1 Wednesday, September 2, before 5:55pm

Homework 2 Wednesday, September 9, before 5:55pm
Homework 3 Wednesday, September 16, before 5:55pm
Homework 4 Wednesday, September 30, before 5:55pm
Homework 5 Wednesday, October 7, before 5:55pm
Homework 6 Wednesday, October 14, before 5:55pm
Homework 7 Wednesday, October 21, before 5:55pm
Homework 8 Wednesday, November 4, before 5:55pm
Homework 9 Wednesday, November 11, before 5:55pm
Homework 10 Wednesday, November 18, before 5:55pm

Grades: Your grade for the course will be calculated based on ten homework assignments, three midterm exams, and one final exam. Each homework assignment is 3 points, for a total of 30 points. Each midterm exam is 15 points, for a total of 45 points. The final exam is 25 points. The sum of these points determines your grade according to the scale below.

A: **90**-100   B: 80-**89.99**   C: 70-**79.99**   D: 60-**69.99**   F: below 60

+ or – may be attached to final letter grades, at the discretion of the instructor.

Lectures: Lectures will be held over Blackboard Collaborate Ultra and/or Zoom. There is always a small possibility that a lecture could be interrupted or canceled due to a technical failure or unexpected instructor illness. For that reason, I suggest checking your email in the event that such an occurrence appears likely, as GMU email is the official form of communication for the course. If GMU itself closes, then emergency closing info may be obtained by calling 703-993-1000.

Email Responses and Grade Postings: Until around 5:30pm on each weekday I am often occupied by other responsibilities, so please keep that in mind when making appointments, asking questions, or writing time-sensitive emails. I will generally be able to respond to emails within 24 hours, with exceptions for weekends and times when I am attending a teleconference. Considerations may lead to your classmates receiving extensions on certain assignments, and I prefer to upload everyone's grades for a particular assignment at the same time. For that reason, grades for assignments may take up to a week to appear, except for final exam grades, which will generally appear within 48 hours of the time when the last final exam is submitted.

Prerequisites: For precise information on prerequisites, see http://catalog.gmu.edu/ and click on "Courses" on the left. Then, select Prefix: "MATH" and Code "108." If you have difficulty registering for this course, contact Christine Amaya at **camaya@gmu.edu**.

Late assignments: No make-up exams or homework assignments will be given in this course. Late homework or exams turned in after their respective deadlines are generally not accepted. In certain extenuating circumstances, an extension may be granted so that an exam or a homework assignment may be turned in a specified number of days late. Extensions on an assignment or exam must be requested before that assignment or exam's deadline, not after it has passed.

Honor Code: Sharing information of any kind about exams is an Honor Code violation. Any violations will be referred to the Office of Academic Integrity. You are expected to follow the GMU Honor Code: see http://academicintegrity.gmu.edu/honorcode/ for more info.

Academic Accommodation of Disability: If you are a student with a disability and you need academic accommodations, please tell me by September 1 and contact the Office of Disability Services at 703-993-2474. All academic accommodations must be arranged through that office. For more complete information on Disability Services, see "Disability Services" on the last page.

General Remarks: Please be considerate of other students. Turn off and/or silence cell phones before class if you can and keep outside noise at a minimum. Be respectful of other students. We all have different experiences with math. What is easy for one may be challenging for another. The following is a tentative schedule for the course:

W
August 26, Class 1: Intro to Course Sec. 1.1 Functions Sec. 1.3 Linear and Quadratic Functions
September 2, Class 2: Sec. 2.1 Introduction to Limits Sec. 1.4 Polynomial and Rational Functions Sec. 2.2 Infinite Limits and Limits at Infinity
September 9, Class 3: Sec. 1.5 Exponential Functions Sec. 1.6 Logarithmic Functions Sec. 3.1 The Constant e and Continuous Compound Interest
September 16, Class 4: Midterm Exam 1 Review Midterm Exam 1 is a timed take-home exam, with details to be announced in email. It will be available from 8:35pm, September 16, until 5:55pm, September 23.
September 23, Class 5: Sec. 2.4 The Derivative Sec. 2.5 Basic Differentiation Properties
September 30, Class 6: Sec. 2.7 Marginal Analysis in Business and Economics Sec. 3.2 Derivatives of Exponential and Logarithmic Functions
October 7, Class 7: Sec. 3.3 Derivatives of Products and Quotients Sec. 3.4 The Chain Rule
October 14, Class 8: Sec. 3.5 Implicit Differentiation Sec. 3.7 Elasticity of Demand
October 21, Class 9: Midterm Exam 2 Review Midterm Exam 2 is a timed take-home exam, with details to be announced in email. It will be available from 8:35pm, October 21, until 5:55pm, October 28.
October 28, Class 10: Sec. 4.1 First Derivative and Graphs Sec. 4.2 Second Derivative and Graphs Sec. 4.4 Curve-Sketching Techniques
November 4, Class 11: Sec. 4.5 Absolute Maxima and Minima Sec. 4.6 Optimization Sec. 5.1 Antiderivatives and Indefinite Integrals
November 11, Class 12: Sec. 5.2 Integration by Substitution Sec. 5.4 The Definite Integral Sec. 5.5 The Fundamental Theorem of Calculus
November 18, Class 13: Midterm Exam 3 Review Midterm Exam 3 is a timed take-home exam, with details to be announced in email. It will be available from 8:35pm, November 18, until 5:55pm, November 25.
December 2, Class 14: Sec. 6.2 Applications in Business and Economics Final Exam Review The final will be available from 8:35pm, December 2, until 5:55pm, December 6.

Important Dates for the Fall 2020 Semester: The last day to add courses is Monday, August 31. The last day to drop a course with a full tuition refund is Tuesday, September 8. The last day to drop a course with a half tuition refund is Tuesday, September 15. The last day to drop a course in the unrestricted withdrawal period is Monday, September 28. The evaluation period for PatriotWeb midterm grades begins on Monday, September 21. The last day to drop a course in the selective withdrawal period is Wednesday, October 28. On Wednesday, November 25, there will be no classes due to the Thanksgiving Recess.

Exam Reviews: Exam Reviews and/or practice exams will often be available on Pearson MyLab about one week prior to each exam. These will roughly simulate test questions and conditions.

Tutoring Center: The Math Tutoring Center at GMU is open online Monday through Thursday, 2pm to 7pm. If you are interested in using this resource, you must self-enroll. See **https://science.gmu.edu/academics/departments-units/mathematical-sciences/math-tutoring/tutoring-center-hours-and** for further information. If you have any other queries about the Math Tutoring Center, email Gabriela Bulancea at **gbulance@gmu.edu** with your questions.

Feedback: I am interested in hearing your feedback about the course, including both things you especially like and your suggestions for improvement. Information about how to provide feedback will be sent by email or posted as an announcement on Blackboard after midterms.

Learning Outcomes: The learning outcomes that we will achieve are:

1. Students are able to interpret quantitative information (i.e., formulas, graphs, tables, models, and schematics) and draw inferences from them.

2. Given a quantitative problem, students are able to formulate the problem quantitatively and use appropriate arithmetic, algebraic, and/or statistical methods to solve the problem.

3. Students are able to evaluate logical arguments using quantitative reasoning.

4. Students are able to communicate and present quantitative results effectively.

Course Goals: The course itself seeks to satisfy the following goals:

1. Students improve and solidify their algebraic skills.

2. Students understand and apply derivatives as a tool to analyze change in quantified models.

3. Students analyze and interpret results in the context of Business and IT applications.

4. Students understand and compute integrals and their relationship to derivatives.

ITS Support Center: Trouble with technology related to this course should be addressed to the ITS Support Center. See **https://its.gmu.edu/service/its-support-center/** for more information. I suggest emailing the ITS Support Center at **support@gmu.edu** for help. You are generally responsible for making sure that you obtain and maintain your MyLab access, internet access, and access to course materials, so do not procrastinate on contacting the ITS Support Center right away if you have technical issues of any kind.

Required Access to Pearson's MyLab: You can purchase an access code only for about ninety dollars online, to access MyMathLab and the eText version of our textbook, Calculus for Business, Economics, Life Sciences and Social Sciences, 14th edition. At the bookstore, this may be listed as "Required." See Blackboard or look for GMU emails from me for more information about MyMathLab. Alternatively, you can purchase the item called "Calculus for Business, Economics, Life Sciences and Social Sciences Plus NEW MyMathLab." If you buy a used book, please be sure that you have an access code for Pearson's MyLab, as it is required for this course.

Access to Pearson's MyLab: You are referred to the Powerpoint presentation available at **https://pearsoncustomersuccess.co/ccb66** for help with access to Pearson's MyLab. If you need further support, visit **https://support.pearson.com/getsupport/s/** for help.

Required Technologies: You need regular and consistent access to a computer, connected to the internet, for this course. It is highly recommended that you have access to high speed internet to attend or watch lectures. This online course is taught via Blackboard. To get to our course, login to http://mymason.gmu.edu, select the Courses Tab, and Math 108 can be found in the Course List. You need access to your GMU email account. In order to ensure student privacy, I plan to only correspond with you via your GMU email. Any video lectures that are recorded will most likely be posted on Blackboard or YouTube. You need to be able to access Blackboard and/or Youtube to participate in this course.

Disability Services: Disability Services at George Mason University is committed to providing equitable access to learning opportunities for all students by upholding the laws that ensure equal treatment of people with disabilities. If you are seeking accommodations for this class, please first visit http://ds.gmu.edu/ for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Phone: (703) 993-2474 Email: ods@gmu.edu

Counseling and Psychological Services: Counseling and Psychological Services are available for GMU students. See http://caps.gmu.edu or call 703-993-2380 for more info.

Student Support and Advocacy Center: SSAC provides guidance to students experiencing hardship or trauma, or otherwise encountering barriers to success. See https://ssac.gmu.edu/ or call 703-993-3686 for more info.

University Policies: The University Catalog at http://catalog.gmu.edu is the central resource for university policies affecting students, faculty and staff conduct in university academic affairs. For other policies, you are referred to the http://universitypolicy.gmu.edu/ website. All members of the university community are responsible for knowing and following established policies. In particular, note that this Math 108 course is one of those courses which can generally be taken at most 3 times.