MATH 108: Introductory Calculus with Business Applications (3 credits)

Fall 2020

Instructor: Samuel Fairchild, Ph.D.

Pedagogy: This course is offered as an online synchronous course. We will communicate and learn using Blackboard/Zoom/discussion boards and break out groups. Class participation and attendance is mandatory.

Synchronous Meeting Times: Tuesday/Thursday 7:20pm – 8:35pm . The link to Zoom meetings provided in My Black Board **(MBB)**

Instructor Contact Information:

Email: sfairch@gmu.edu

Discussion Board: use Blackboard menu under Math 108 for access. This is a great place to ask questions about the mathematics in this course, and basic logistics of the class. Not a good forum to discuss your specific grade. Please arrange a direct meeting with me for grade discussions.

Office Hours (Virtual):

Monday/Wednesday 7:30pm – 8:30pm – Zoom link provided in **MBB**

Additional help by appt

Discussion Board: In addition to office hours and regularly scheduled meeting times, you can use the discussion board to post questions regarding the weeks learning objectives. I will monitor and provide feedback. We are all learning together, so if you know an answer to a question, please feel free to respond.

Prerequisites: Either one of the following requirements will suffice:

- Minimum score of 13 in 'Math Placement Algebra I'. http://math.gmu.edu/placement test.htm
- Successful completion of self-paced algebra program offered by the Math Literacy Center.

Those who have problems registering should talk to Christine Amaya, the Senior Secretary of the Department of Mathematical Sciences, camaya@gmu.edu, phone (703)-993-1460.

Course Description:

To provide a basic and firm understanding of elementary calculus. Topics to include limits, continuity, derivatives, techniques for differentiating continuous functions, applications to business and life sciences. Time permitting, integration and the fundamental theorem of calculus.

Goals:

Quantitative Reasoning: This course satisfies GMU's Quantitative Reasoning Foundation Requirement.

The learning outcomes that we will achieve to meet that requirement are:

1. Students can interpret quantitative information (i.e., formulas, graphs, tables, models, and schematics) and draw inferences from them.
2. Given a quantitative problem, students can formulate the problem quantitatively and use appropriate arithmetic, algebraic, and/or statistical methods to solve the problem.
3. Students can evaluate logical arguments using quantitative reasoning.
4. Students can 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.

Required Items

Required Materials:

1. **E-Book** Access Code only ($90 online) to access the ebook and MyMathLab (this is my recommendation) for *Calculus for Business, Economics, Life Sciences and Social Sciences, 14th edition*

   OR

   Calculus for Business, Economics, Life Sciences and Social Sciences Plus NEW MyMathLab
   ISBN: 9780321925718 ($150 new) - at the bookstore website this says "CALCULUS F/BUS., ECON…(LOOSE) – W/ACCESS"

   If you buy a used book, please be sure you have an access code. It is required for this course.

2. Calculator: You may use a Scientific or graphing calculator in this course. Please be aware that you are required to show evidence for graphing in this course. No credit is given for just drawing the graph that you see on your calculator.

Required Technologies:

1. You need regular and consistent access to a computer, connected to the internet for this course.
2. It is highly recommended that you have access to high speed Internet to watch video lectures.
3. This online course is taught via Blackboard Courses. 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.
4. You need access to your GMU email account. To ensure student privacy, I only correspond with you via your GMU email.

Required Meeting Dates:

We meet Tuesdays and Thursdays 7:20pm – 8:35pm. Attendance is **mandatory,** and participation is expected, not only during the regularly scheduled meeting time, but also within the break-out groups during class time.

Assignments

Grading:

Attendance and Group participation	10%	
Homework	10%	
Quizzes (MML and Written)	20%	
Exam 1 (MML and Written)	20%	
Exam 2 (MML only)	20%	
Final Exam (MML and Written)	20%	Tuesday December 15, 7:30pm – 10:30pm

The standard grade breakdown applies for overall course grades:

A	90% - 100%
B	80% - 90%
C	70% - 80%
D	60% - 70%
F	Below 60%

+/- added at instructor discretion

MyMathLab Homework and quizzes

We will use MyMathLab in this course to complete homework and take some quizzes. Some quizzes will be administered in class in written form

See Start Here in Blackboard to sign up for the MyMathLab Homework system.

MyMathLab is not operated by GMU. For technical difficulties: https://support.pearson.com/getsupport/s/contactsupport

MyMathLab is a computer graded system. If you get problems right, they are marked correct. There is no partial credit on individual questions. The computer system, like most technical systems is picky about inputs, so please check your answers before submitting your work.

MyMathLab homework and quizzes are due on the due date at 11:59 pm.

MML Homework is accepted late for a 20% penalty up to certain deadlines.

Written Work (no late work accepted)

Written Work Examples:

Example written work is not turned in. I give you these example problems, with all solutions posted so you can use them to help understand how to do the quizzes. If you are having trouble on the quizzes, please take a look at the practice problems for help. You should absolutely be reviewing these before taking the written work quizzes.

Written Work Quizzes:

The purpose of this is so I can see the work that you are doing and give you feedback before the exam.

Written work must be submitted in the "Gradescope" section in Blackboard in a **single PDF file** (PDF only). No images or Word files will be accepted. **Multiple files are not accepted.** No late written work accepted.

Written work is graded out of 10 points, and the point allocation varies depending on the problem. In general, I am looking for:

- Follows "Expectations for Written Work" laid out in the Written Work information and "Graphing using point plotting" (Lesson 1).
- Format is correct (one pdf file). Submissions are not accepted in any other format.
- Work is submitted in a professional, screen-readable way (right-side up, legible. Not sideways or upside down)
- All work is handwritten. No typed work is accepted. No computer generated graphs are accepted.
- Solution is correct, with all relevant steps and supporting work shown.
- Solution is clear, well organized and easy to follow.
- Student uses sentences appropriately to fully explain the solution and/or to interpret the results of the analysis.

Viewing your graded work: Please click on "My Grades" in Blackboard. I make comments and notes on the work you turn in and upload corrected versions. To see these corrections, click on "My Grades" and then on the assignment you want to view. You should see your work with my comments. My solutions to the written work are posted under "Solutions" on Blackboard.

Practice written work problems are provided so you can have more to practice on for the written work portion of the class and exams. These are not collected.

Exams (including the Final Exam):

There are 2 term exams in this course, and one comprehensive final exam. There are no make-up exams, unless you have a documented excused absence (that is an absence that I consider excused). Decisions about excused absences are solely at the discretion of the instructor.

Exam dates are provided on the last page in the schedule. I reserve the right to change exam dates as the semester progresses.

All Exams will be taken completely online. There are no make-ups for the Final Exam. Exams and the Final include a written portion that you will do by hand and upload to Blackboard.

All exams are given to uphold strict academic integrity standards. The following policies are in place for each exam.

1. No collaboration is allowed on the exams. Any indication that you have worked together, used someone else's ideas, use someone else's work, copied, or allowed a fellow student to copy your work is a violation of the GMU Honor Code. The exam should be your work and your work only.
2. You may use a scientific calculator on the exam to do numerical computations only. Having access to a more advanced calculator does not change the work that you are expected to show in this course. You are expected to demonstrate your knowledge of Calculus and graphing in the course, not how to use a graphing calculator.
3. You may use your own notes and problems you have recorded by hand. No other resources may be used.

Late Work Policy:

- Written work: No late work is accepted. One low written work grade dropped to account for excused and unexcused absences.
- MyMathLab HW assignments: A 20% late penalty is deducted for any late work you turn in. This is for homework ONLY
- Exams: No exams may be taken late without an excused absence which is fully documented and deemed to be excused by the professor. If you are going to miss an exam, you should contact the instructor prior to missing to check if your absence is excused. If you can't check prior, check in within 24 hours to avoid any miscommunication.

In this course, I drop two attendance checks, two homework checks and one quiz grade as a blanket "life happens to people" policy. This covers sickness, having work, have a computer break, having a cruddy day where somehow stuff just did not get done, etc.

I do not want to get into the business of judging when adults are "excused" from assignments or not. So, this policy is out of respect for the fact that you are the best judge of when you need to skip assignments to get the other parts of your life done.

Help and Resources

Tutoring:

The Math Tutoring Center is operating. For hours of operation see *http://math.gmu.edu/tutorcenter.htm*

Academic dishonesty and the GMU Honor Code:

You are expected to follow the GMU Honor Code *http://academicintegrity.gmu.edu/honorcode/*

No collaboration is allowed on quizzes or tests. Any indication that you have worked together, used someone else's ideas, copied, or allowed fellow student to copy your work is a **violation of the GMU Honor Code**.

Some of the behaviors that will be considered cheating are:

- Communicating with another person during an assessment
- Copying material from another person
- Allowing another person to copy
- Use of unauthorized assistance
- Use of unauthorized notes or books during an assessment
- Providing or receiving a copy of a quiz or exam used in the course
- Use of a cell phone or pager during an assessment

Withdraw & Audit See the GMU website for important add/drop deadlines: http://registrar.gmu.edu/calendars/fall_2020/

Learning Differences & Special Needs:

If you have a learning or physical difference that may affect your academic work, please see me and contact the Office of Disability Services (ODS) at 993-2474, http://ods.gmu.edu . All academic accommodations must be arranged through the ODS.

Efforts have been made to make this course accessible for students with learning and physical differences. If you find you have additional needs beyond those that have been provided, again, please contact me and ODS so I can be sure that the course is meeting your needs.

Counseling and Psychological Services:

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

University Policies

The University Catalog, http://catalog.gmu.edu, is the central resource for university policies affecting students, faculty and staff conduct in university academic affairs. Other policies are available at http://universitypolicy.gmu.edu/. All members of the university community are responsible for knowing and following established policies.

Math 108 Schedule Fall 2020 - Synchronous

Weeks run from Monday to Sunday in this course and each week contains the following:

Ungraded Assignments:
1. Watch the video lecture posted on the Blackboard website and in MML.
2. Discussions – Post any questions you have to the discussion board.

Graded Assignments:
1. MyMathlab Homework: Due by 11:59 pm EDT on due dates listed below
2. MyMathLab quiz: Due by 11:59 pm EDT on due dates listed below
3. Written Quizzes are due (uploaded) to Blackboard on day of quiz, immediately following quiz end.
4. Exams are due in MML and Blackboard by the time and due date posted on the exam. Exams will be administered online. Exams will be available on exam days, for limited time periods.

Course dates are tentative and subject to change.

Week	Dates	Topic	Due Dates
0	Before Class	Get Ready for Class	August 24 • How to use MyMathLab and Syllabus Quiz • Self-Placement Quiz These are mandatory, and you cannot start on Unit 1 until these two are complete.
1	Aug 24 – Aug 30	Class Introduction Functions and Graphing	August 30 • MML Homeworks • MML Quiz
2	Aug 31 – Sep 6	Finite limits and Infinite limits	September 6 • MML Homeworks • Written Work Quiz
3	Sep 7 – Sep 13	Polynomials and Rational Functions	September 13 • MML Homework • Written Work Quiz
4	Sep 14 – Sep 20	Exponential functions Log functions	September 20 • MML Homework • MML Quiz
5	Sep 21 – Sep 27	Review and Exam 1 **(Tentative)**	September 22 • Exam 1 review. • Last day to turn in HW weeks 1 - 4 September 24 • Exam 1**(Tentative)**
6	Sep 28 – Oct 4	Rates of Change and the derivative	October 4 • MML Homework • MML Quiz
7	Oct 5 – Oct 11	Exponential and Log derivatives	October 11 • MML Homework • Written Work Quiz
8	Oct 12 – Oct 18	Product, Quotient and Chain Rules Class does not meet October 13 – Fall Break	October 18 • MML Homework • MML Quiz

9	Oct 19 – Oct 25	Implicit Differentiation and Applications	October 25 • MML Homework • Written Work Quiz
10	Oct 26 – Nov 1	Review and Exam 2	October 27 • Exam 2 Review MML • Last day to turn in all MML work from units 6, 7, 8, and 9 October 29 • Exam 2 (**Tentative**)
11	Nov 2 – Nov 8	Extrema and Concavity Graphing using derivatives	Nov 8 • MML Homework • MML Quiz
12	Nov 8 – Nov 15	Optimization and Absolute Maxima and Minima	Nov 15 • MML Homework • Written Work Quiz
13	Nov 16 – Nov 22	Areas under a curve, total change, and Integration	Nov 22 • MML Homework • MML Quiz
14	Nov 23 – Nov 29	Applied problems - Integration Class does not meet November 26- Thanksgiving Holiday	Nov 29 • MML Homework • MML Quiz
15	Nov 30 – Dec 6	Fundamental Theorem of Calculus December 3 – • Last full day of class • Final Exam review	December 6 • Last day to turn in HW weeks 11 -15 December 3 • Final Exam Review
16	Dec 15	Comprehensive Final Exam 7:30pm – 10:15pm	December 15 • Final Exam 7:30pm – 10:15pm