BRYANT UNIVERSITY
Mathematics Department
Syllabus – Fall 2025

Course: Math 110: Mathematical Analysis

Instructor: Kaitlyn Hughes
Office: UNI 265
Student Hours: Tuesday 11 am – 1 pm or by appt on Zoom
Email: khughes11@bryant.edu

Textbook: There is no required textbook for this course. You may find the following links helpful if you need additional explanation of the topics covered in class.

Finite Mathematics and Applied Calculus

Business Calculus with Excel

Course Description:
This course offers a foundational understanding of mathematical functions and their applications in business, finance, and global contexts. Using Excel, students will explore tools such as Solver, engage in graphing, and apply marginal analysis, optimization, and linear programming techniques. Key topics include linear, quadratic, and exponential equations, as well as an introduction to derivatives and optimization methods. The course emphasizes practical applications and problem-solving in real-world scenarios.

Objectives:
The primary goal of this course is to understand a variety of real-world uses of mathematical functions. After taking this course, the student should be able to do such things as:

- Better understand functions and their applications: linear, quadratic, and exponential
- Set up and solve linear programming problems
- Study marginal analysis and optimization using derivatives

General Education Program:
At Bryant University, the General Education Program goes a step beyond the typical disciplines and skills to prepare students to make a social impact by engaging students with the United Nations' Sustainable Development Goals (SDGs), using these as a lens to introduce students to local and global needs to improve people's lives. Students will gain insight into how to take on broad workplace challenges, culminating in addressing a concrete problem in the Gen Ed Capstone.

This course will look at small datasets and emphasize at least one of the following goals (SDG) through the use of data analysis, problem-solving, and critical thinking:

- Good health and well-being
- Quality education
- Decent work and economic growth
- Affordable and clean energy
- Industry, innovation, and infrastructure
- Sustainable cities and communities

Student Hours:
While traditionally called *office hours*, I prefer the term *student hours*—because this time is set aside specifically for you. When you come to student hours, you're not interrupting me; this is dedicated time for your questions, support, and connection.

Research shows that individual support, like student hours, is closely linked to student success. Because of this, I ask that each of you schedule a 10-minute one-on-one meeting with me before our first exam. This meeting will count as 10 points toward your first exam grade. You're welcome to use this time however it's most helpful to you—whether that means going over a specific assignment, working through extra practice problems, or simply having a conversation so we can get to know each other better.

To schedule your meeting, visit the "Student Hours" page on Canvas. You'll find instructions for booking a time and a few ideas for what we might talk about. I look forward to meeting with you!

Learning Attitude:
In this class, I encourage a growth mindset, where mistakes are viewed as an important part of the learning process. It's completely normal to make errors as you work through mathematical problems—in fact, you will see me make mistakes too! What matters is how you respond to those mistakes. Each mistake provides valuable insight into areas that need more practice and understanding.

I want you to feel comfortable taking risks and challenging yourself in this class. Please don't hesitate to volunteer answers or ask questions—these moments are essential for your learning. Your participation not only helps me understand how well you're grasping the material, but it also supports your classmates' learning and enriches our classroom community.

Learning Environment:
It is of the utmost importance to create a learning environment where all identities are welcomed, supported, and honored. In this class, we will recognize, respect, and support a diverse range of thoughts, perspectives, and experiences in effort to honor and respect your identities (including, but not limited to race, gender, sexual orientation/identity, neurodivergence, class, religion, age, mental/physical ability, socio-economic status, etc.)

To help accomplish this:

- If you use pronouns and/or a name which is different than what may be listed, please do not hesitate to inform me.
- If you are struggling outside the classroom and it is impacting your performance within the class, please connect with me so I can serve as a resource for you.
- If something said or done in class offends you, please feel encouraged and safe to connect with me so we may be able to address it.

Communication Policy:
I care about your questions and concerns, and I aim to be responsive while also modeling healthy boundaries.

- During the week, I will respond to emails within **24 hours**.
- On weekends, I will respond within **48 hours**.
- I check and reply to emails **between 9:30 am and 2:30 pm.** You are always welcome to email me at any time, but please know that replies will usually come during those hours.
- Occasionally, I may reply outside of the hours listed above—that's my choice and not an expectation.

If you don't hear back within these timeframes, feel free to gently follow up. I want to be sure you feel supported.

Attendance Policy:
I understand that sometimes life can make it difficult to attend every class, but regular attendance is important because each lesson builds on the one before. I encourage you to stay connected with the material and take responsibility for your learning. If you do miss a class, feel free to reach out to your classmates for notes and any important updates. You can also contact me directly if you need any help catching up.

Calculator:
For this course, a scientific calculator is required, and it's important to bring it to class every day to help with your learning. During exams and quizzes, please remember the following:

- Each student must have their own calculator.
- Calculators cannot be shared under any circumstances.
- If you forget your calculator, you will need to complete the assessment without one.

If you have any concerns or need assistance with a calculator, feel free to reach out to me. I have a few calculators that can be borrowed for a class period, but it is on a first come, first serve basis.

Excel:
We will be using Excel regularly throughout the course to explore case studies and apply what we're learning in a hands-on way. Excel should already be installed on your Bryant-issued laptop, so please take a moment to open it before our first use to ensure everything is working and the license is active. If you run into any issues, the IT Service Desk (Unistructure Rotunda 2nd floor) can help.

On days when we'll be working in Excel (as noted in the course schedule), please bring your fully charged laptop to class so you're ready to participate. Please avoid bringing personal computers on these days, as the directions might not be the same and that will slow down the flow of the class.

Cell Phones:
I kindly ask that you avoid using your cell phone during class to help maintain focus and create a positive learning environment for everyone. During exams or quizzes, cell phones are not allowed, and they cannot be used as calculators. If a phone or other electronic device is used during an assessment, it may result in a score of "0" for that assessment

Academic Honesty Policy:

It's important to approach your work with honesty and integrity. Cheating and plagiarism can have serious consequences, including failing the assignment or exam, and may even affect your grade for the entire course. To avoid any misunderstandings, I encourage you to review the Academic Honesty Policy in the Student Handbook. If you ever have any questions or concerns about what is expected, please don't hesitate to reach out.

Acceptable Use of AI Tools:

I recognize that AI tools can be powerful learning aids when used with intention and integrity. In this class, you are welcome to use AI tools (like ChatGPT or others) to support your learning in the following ways:

- To generate extra practice problems
- To get explanations of math concepts or methods you're trying to understand

However, to support your growth and ensure fairness:

- Do not use AI tools to complete assigned homework or case studies
- All submitted work should reflect your own understanding and effort
- Any use outside of this permission constitutes a violation of Bryant's Academic Honesty Policy.

My goal is to help you build real skills and confidence in math, and using AI responsibly can be a helpful part of that journey. If you're ever unsure whether something is okay, please just ask—I'm here to support you.

Assessments and Grading Policies:

Your grade in this class will be based on **640** points. I have chosen to use points instead of weight averages because points provide a more transparent look at how each assignment influences your grade. There will be a combination of in class and out of class assignments. The total number of points you accumulate during the semester will determine your final grade.

Here is the breakdown:

3 Exams @ 100 pts each	**300 points**
3 Quizzes @ 50 pts each	**150 points**
3 Excel Assignments @ 30 pts each	**90 points**
10 Homework Assignments @10 pts each	**100 points**

Letter Equivalent Grades are determined as follows:

Letter Grade	Points	Letter Grade	Points
A	595-640	C+	493-511
A-	576-594	C	467-492
B+	557-575	C-	448-466
B	531-556	D+	429-447
B-	512-530	D	384-428
383 accumulated points or less is an F			

I value the effort, engagement, and presence each of you brings to our learning community. While grades are based primarily on the quality of your work, I may also consider factors such as attendance, punctuality, participation, and overall effort when determining final grades—especially in borderline cases. Please note that extra credit opportunities will not be offered, and final grades reflect your progress as demonstrated throughout the course.

Please note: Emails requesting grade changes or "bumps" after the final exam will not receive a response.

Exam and Quiz Policies:
All students are expected to be prepared for and take assessments in class on the scheduled day. I understand that unexpected situations can come up—if you're unable to attend, please email me *before* the assessment so we can make arrangements. If I don't hear from you ahead of time, the opportunity to take a make-up quiz or exam may no longer be available. Make-up assessments may differ in format from the original, and they need to be completed within one week of the original date.

Please note that quizzes and exams cannot be retaken once completed. If you feel like you are not ready for an assessment, please ask for an extension.

The final exam will cover only the material since the last exam—it is not cumulative.

Homework:
You will have 10 homework assignments throughout the semester, all with 10 questions. These will be on myOpenMath. Homework assignments will be due by 12 pm on Wednesday. If you need an extension, please reach out ahead of the due date.

Go to myopenath.com and create an account.
course ID: 257611
enrollment key: Hughes110

Life Happens Policy
I understand that life can be unpredictable. To support you while also maintaining fairness and grading timelines, I offer a "Life Happens" extension policy for homework and case studies only (**this does not apply to quizzes or exams**).

- You may request up to **two** 48-hour extensions during the term. I will keep track of these requests in Canvas.
- To use an extension, you must email me *before* the assignment deadline—no explanation is necessary.
- This policy is designed to give you some breathing room while still allowing me to manage grading in a timely way.

If you do not request an extension in advance, late work is still accepted, but with a 1-point deduction per day it is late.

My goal is to be flexible and supportive while helping you stay on track. Please don't hesitate to reach out if you need help managing your workload.

Extra Help:
In addition to taking advantage of my student hours for extra help, you are strongly encouraged to utilize the Academic Center for Excellence (ACE) located in UNI 275.
ACE provides 3 options for extra help:

- ***Learning Lab*** - a drop-in center where you can get answers to all your questions or just sit and do your homework
- ***Math Specialist*** - work with a math faculty/staff member in a 30–60-minute private session (appointment required at least one day in advance on Nav)
- ***Math Peer Tutors*** - schedule a 30-60-minute session with a student tutor (appointment required at least one day in advance)

Office of Accessibility Services:
Professors at Bryant University will provide equal access to the classroom and all course material as required by Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990, and the ADA Amendments Act of 2008. Accommodations will be implemented as approved by the Office of Accessibility Services (OAS). I invite you to see me during student hours to discuss previously approved accommodations and needs that are specific to this course. Students who plan to request accommodations, or simply want to explore OAS services, including the Testing Center, may use this link to learn more.

Academic Testing Center:
The Bryant University Testing Center provides a designated space for students to complete exams in a quiet, secure, and equitable environment. It can also be used for make-up exams. Students must inform their professor in advance if they're going to need to use the testing center. Students must book exams two business days prior to taking the exam.

Students who anticipate using OAS-approved testing accommodations must notify their professor and book their exam with the Academic Testing Center. In the classroom, once an exam has begun, students with accommodations cannot retroactively ask for them to be implemented.

Using the testing center to get an unfair advantage on a test is a violation of academic honesty. Be aware that the testing center monitors test activity, both on screen and in the center, and verifies the identification of the student. The student who is taking the exam should be the student registered for the course to ensure equity and fairness in all grading situations.

Course Outline by Topic (subject to change)

I. LINEAR FUNCTIONS
- A. Slope
- B. Slope-intercept form, writing equations
- C. Graphing lines, intercepts
- D. Applications: profit, revenue, cost, depreciation, appreciation, supply, demand
- E. Scatterplots, line of best fit, residuals
- F. Excel: trendline, regression, estimation

II. QUADRATIC FUNCTIONS
- A. Solving quadratic equations: factoring and quadratic formula
- B. Graphing parabola, vertex, intercepts
- C. Applications: profit, revenue, cost, gravity, supply, demand
- D. Excel: trendline, regression, estimation

III. EXPONENTIAL FUNCTIONS
- A. Exponential functions, e
- B. Exponential growth and decay
- C. Exponential graphing
- D. Solving exponential equations
- E. Compound and continuous interest
- F. Annuities and loans
- G. Excel: Financial math

IV. LINEAR PROGRAMMING
- A. Graphing systems of inequalities
- B. Graphing with maximization and constraints
- C. Applications
- D. Excel: Linear programing, solver, and slack variable analysis

V. DERIVATIVES
- A. Derivative power rule
- B. Derivative exponential rule
- C. Finding maximum and minimums from derivatives
- D. Application: revenue, cost, profit, business models