
Please note that this syllabus was updated on 3/20/20.

CLASS TIMES AND LOCATIONS

- Math 142-512 : TR 11:10am-12:25pm ~~HELD-111~~ via Zoom

***As of 3/23/20, the instructor will give class via Zoom during class time.**

CATALOG DESCRIPTION AND PREREQUISITES

Business Calculus (Math 1325, Math 1425) Limits and continuity; techniques and applications of derivatives including curve sketching and optimization; techniques and applications of integrals; emphasis on applications in business, economics, and social sciences. Only one of the following will satisfy the requirements for a degree: MATH 131, MATH 142, MATH 147, MATH 151, and MATH 171. Prerequisites: MATH 140 or equivalent or acceptable score on Texas A&M University math placement exam.

LEARNING OUTCOMES

Upon successful completion of this course, students will:

- Logically formulate mathematical variables and equations to quantitatively create mathematical models representing problems in everyday life, as well as business, so that calculus can be applied to achieve an optimal solution.
- Identify patterns in numeric data to calculate limits and derivatives of functions numerically.
- Justify whether a function is continuous or not using the mathematical definition of continuity.
- Understand the derivative as a rate of change in order to quantitatively apply it to everyday life as well as business applications such as marginal analysis.
- Investigate the relationship between a function and its first and second derivatives, and use the information obtained from its derivatives to identify pertinent information about the function.
- Demonstrate the ability to implicitly differentiate functions in order to solve applications involving related rates.
- Apply the definite integral to quantitatively determine solutions to problems in everyday life and business such as area between curves, average value of a function, and producers' and consumers' surplus.
- Recognize and appreciate the relationship between the derivative (rate of change) and the definite integral (accumulation of change), and utilize the Fundamental Theorem of Calculus as the bridge between the two.

CORE OBJECTIVES*Critical Thinking*

- Students will analyze a function and justify whether or not it is continuous using the definition of continuity.
- Students will use inquiry to determine the best method for taking derivatives of complicated functions.
- Students will identify and categorize information about a function in order to construct a graph of its derivative.
- Students will apply calculus to find innovative ways to graph complicated functions without the aid of technology.
- Students will analyze and synthesize data and think creatively to develop mathematical models for optimization purposes.
- Students will examine how the Fundamental Theorem of Calculus connects differential and integral calculus.

Communication Skills

- Students will symbolically relay mathematical information and concepts by creating variables and writing equations.
- Students will recognize, construct, and interpret graphs of basic functions.
- Students will write mathematical information symbolically to describe the behavior of functions.
- Students will justify results that use mathematical definitions such as the definition of continuity by writing proofs.
- Students will explain verbally in class the connection between derivatives, rates of change, and slopes of tangent lines.
- Students will develop sketches of the graphs of complicated functions by analyzing their first and second derivatives.
- Students will explain (both in writing and verbally) mathematical solutions to problems.
- Students will be required to answer questions during lecture concerning topics discussed in class.

Empirical and Quantitative Skills

- Students will evaluate limits numerically and use the information to draw conclusions about the behavior of a function.
- Students will calculate a derivative numerically and explain the result in the context of the problem.
- Students will use marginal analysis to make informed and quantitative business decisions.
- Students will manipulate empirical data to develop a mathematical model to use in an optimization problem, such as maximizing revenue or minimizing cost, and then apply calculus to find and interpret the optimal solution.
- Students will apply the Fundamental Theorem of Calculus to quantitatively compute the accumulated change of a quantity.

INSTRUCTOR INFORMATION

Name	Byeongsu Yu
Email	byeongsu.yu@math.tamu.edu
Office	Blocker 506B
Office Hours	Tuesday and Wednesday 9am-10:30am via Zoom or by appointment *As of 3/23/20, there will be no in person office hours.
Course Page	Please login to http://ecampus.tamu.edu
Phone	Math Department: 979-845-3261 (There is no phone in my office, so email is a better way to reach me.)

REQUIRED MATERIALS

TEXTBOOK: *Calculus: Applications and Technology* by Tomastik, 3rd Edition

Note: You will be required to purchase access to the online homework system, WebAssign, but doing so will automatically give you access to the eBook. There are a variety of purchasing options available (course specific access or Cengage Unlimited). This access can be purchased through the local bookstores or on WebAssign. Starting on the first day of classes, you will be granted access for a trial period while you determine the appropriate purchasing option for you.

WEBASSIGN ACCESS: WebAssign will be used for homework in this class. In order to use WebAssign, you must purchase access. For access purchasing information and options, please visit <http://www.math.tamu.edu/courses/eHomework/>

CALCULATOR: A TI-83 (any version), TI-84 (any version) or the TI-Nspire (non-CAS version) calculator is **REQUIRED**, and you must bring your calculator to each class. If you need to use a calculator other than those listed, it **MUST** not perform symbolic mathematics and **you must have my permission to do so**. I will be demonstrating calculator techniques using the TI-84. You must bring your calculator to every class period. You may not share calculators during exams or quizzes.

TEXAS A&M STUDENT ID: Bring your student ID to each class.

ACCESS TO ZOOM: As of 3/23/20, you are required to have access to Zoom. Downloading the client to your computer provides the most seamless experience. To get started, visit <https://tamu.zoom.us/download>. Click **Download Zoom Client for Meetings**. Once installed, click **Sign In with SSO**. Type **tamu** in the box before **.zoom.us**. Click **Continue**. Log in with your NetID and password.

TENTATIVE COURSE TOPICS AND CALENDAR OF ACTIVITIES

WEEK	TOPIC	SECTIONS
Week 1: 1/13 – 1/17	Brief Precalculus Review, Limits and Continuity	Review, 3.1
Week 2: 1/20 – 1/24	Limits and Continuity	3.1
Week 3: 1/27 – 1/31	Rates of Change, The Derivative	3.2, 3.3
Week 4: 2/3 – 2/7	Simple Derivative Rules and Marginal Analysis, Product and Quotient Rules	4.1, 4.2
Week 5: 2/10 – 2/14	Review, EXAM I (3.1-3.3, 4.1, and 4.2)	
Week 6: 2/17 – 2/21	Chain Rule, Derivatives of Exponential and Logarithmic Functions, Analyzing Graphs with the First Derivative	4.3, 4.4, 5.1
Week 7: 2/24 – 2/28	Analyzing Graphs with the Second Derivative, Limits at Infinity, Curve Sketching Techniques	5.2, 5.3, 5.4
Week 8: 3/2 – 3/6	Absolute Extrema, Optimization	5.5, 5.6
Week 9: 3/9 – 3/13	Spring Break – No Classes	
Week 10: 3/16 – 3/20	No Classes	

Week 11: 3/23 – 3/27	Review, EXAM II (4.3, 4.4, and 5.1-5.5)	
Week 12: 3/30 – 4/3	Antiderivatives, Substitution	6.1, 6.2
Week 13: 4/6 – 4/10	Estimating Distance Traveled, The Definite Integral	6.3, 6.4
Week 14: 4/13 – 4/17	Fundamental Theorem of Calculus Part 2 and Average Value of a Function, Area Between Curves, 6.7 topic: Producers' and Consumers' Surplus	6.5, 6.6, 6.7 topic (optional)
Week 15: 4/20 – 4/24	Review, EXAM III (5.6 and 6.1-6.6, 6.7 topic (optional))	
Week 16: 4/27 – 5/1	Review for Final Exam, Final Exams	
Week 17: 5/4 – 5/8	Final Exams	

GRADING POLICIES

The course grading will be based on the tables below. At the end of the semester, you will receive the grade you *earned* according to the scale given. Due to FERPA privacy issues, I cannot discuss grades over email or phone. If you have a question about your grade, please come see me in person.

As of 3/23/20, the final exam will now be optional. Your grade will be determined based on one of the tables below, depending on whether or not you choose to take the final exam. This decision must be communicated to your instructor by their given deadline which will be a date after you have received your grade for Exam 3.

GRADE BREAKDOWN WITH FINAL EXAM
GRADE BREAKDOWN WITHOUT FINAL EXAM

Activity	Date	Percentage
Exam I (3.1-3.3, 4.1-4.2)	2/13/20	17%
Exam II (4.3-4.4, 5.1-5.5)	3/26/20	17%
Exam III (5.6, 6.1-6.6, 6.7 topic (optional))	4/23/20	17%
Computer Homework	Weekly	15%
Quizzes	As of 3/23/20, there will be no more quizzes.	10%
Final Exam	See below	24%
TOTAL		100%

Activity	Date	Percentage
Exam I (3.1-3.3, 4.1-4.2)	2/13/20	25%
Exam II (4.3-4.4, 5.1-5.5)	3/26/20	25%
Exam III (5.6, 6.1-6.6, 6.7 topic (optional))	4/23/20	25%
Computer Homework	Weekly	15%
Quizzes	*As of 3/23/20, there will be no more quizzes	10%
TOTAL		100%

GRADING SCALE : A($90 \leq \text{AVERAGE} \leq 100$), B($80 \leq \text{AVERAGE} < 90$), C($70 \leq \text{AVERAGE} < 80$), D($60 \leq \text{AVERAGE} < 70$), F(AVERAGE < 60)

GRADE APPEAL POLICY: Any questions concerning the grading of a Quiz or Exam must be presented to me within one week of the return of the assignment. Otherwise the grade will not be changed. I will be posting grades during the semester on e-campus. Please go to <http://ecampus.tamu.edu> to login.

CLASS NOTES

On our course page in eCampus, you will find a shell of notes for each chapter. Please print these out and bring them to class each day. ***As of 3/23/20, the plan is to broadcast live session that you can watch to complete the class notes. You can see the video if you cannot see the live session.**

HIGHLY SUGGESTED HOMEWORK

Your daily highly suggested homework will prepare you for your computer homework, quizzes, and exams, but will not be turned in for a grade. It is crucial that you work these problems. A list of highly suggested homework problems can be found at the end of this syllabus and on eCampus.

COMPUTER HOMEWORK

There will be a graded computer homework assignment for each section we cover in-class. These assignments will be taken on the WebAssign computer system. For more information about purchasing access and to login please go to <http://www.math.tamu.edu/courses/eHomework>

QUIZZES *AS OF 3/23/20, THERE WILL BE NO MORE QUIZZES. YOUR CURRENT QUIZ AVERAGE WILL REPRESENT 10% OF YOUR FINAL GRADE.

You will typically be given a quiz each week, which will occur in various formats. Quizzes may be in-class or take-home, individual or by group. You are expected to follow all quiz instructions to ensure academic integrity.

GROUPS

At the beginning of the semester you will be assigned to a small group of students that you will sit by. It is my hope that you can discuss mathematical concepts with these students to better understand them. Throughout the semester you will be given some quizzes in which you will be allowed to discuss with your group members.

EXAMS

There will be **three in class exams** during the semester. You must bring your student id, approved calculator, and grey TAMU Scantron to each exam. Calculators will be checked before or during each exam. If there are any programs, notes, or formulas on your calculator which I did not give you, the occurrence will be considered scholastic dishonesty. The tentative exam schedule is as follows:

Exam I: Thursday, February 13, 2020 2020

Exam II: Thursday, March 26, 2020

Exam III: Thursday, April 23, 2020

***As of 3/23/20, Exam II, Exam III, and the Final Exam will be given online. Further details will be disseminated as they are determined.**

FINAL EXAM

The final exam will be **comprehensive** and is **NOT required** for all students. If your final exam grade is higher than your lowest test grade, the grade on your final will replace that test grade in the final grade calculation. The final exam schedule is as follows:

Section	Class Time	Final Exam Date, Time, and Location
142-512	TR 11:10am-12:25pm	Thursday, April 30 th 3:00-5:00pm in HELD 111 (Regular Classroom)

(You can refer to <http://registrar.tamu.edu/Courses,-Registration,-Scheduling/Final-Examination-Schedules> for the University final exam schedule.)

ATTENDANCE AND MAKE-UP POLICIES

Attendance is essential to complete this course successfully.

- **Excused Absences:** University student rules concerning excused and unexcused absences, as well as makeups, can be found at <http://student-rules.tamu.edu/rule07>. In particular, make-up exams and quizzes or late homework will NOT be allowed unless a **University approved reason is given to me in writing**. Notification *before* the absence is **required** when possible. Otherwise (e.g. accident, or emergency), you must notify me **within 2 working days** of the

missed exam, quiz, or assignment to arrange a makeup. In all cases where an exam/quiz/assignment is missed due to an injury or illness, whether it be more or less than 3 days, **I require a doctor's note**. I will not accept the "University Explanatory Statement for Absence from Class" form. Further, an absence due to a non-acute medical service or appointment (such as a regular checkup) is *not* an excused absence.

- If you have a University approved absence for missing an exam, you will be expected to make up your exam according to the Department Make-up Schedule that can be found at <http://www.math.tamu.edu/courses/makeupexams.html>, starting with the first option for each exam. Only if you have a University approved absence for the day of the exam and the previous make-up day will you be allowed to use the later options or have other arrangements made. You must discuss (email is fine) the need for a make-up exam with me before going to a scheduled time. ***As of 3/23/20, it is unknown how make-ups will be handled. If you are excused from an exam, please notify the instructor as soon as possible so that arrangements for a make-up exam can be made.**

ACADEMIC INTEGRITY

"An Aggie does not lie, cheat, or steal, or tolerate those who do."

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System. For additional information please visit <http://aggiehonor.tamu.edu>.

AMERICANS WITH DISABILITIES ACT (ADA)

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or at (979) 845-1637 or visit <http://disability.tamu.edu>. Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

CLASS POLICIES

It is my responsibility to create a learning environment in which everyone respects one another and their fellow Aggie's opportunity to learn. You can help me create this learning environment by being on time to class, staying focused on the math concepts we are talking about (no electronic devices except your calculator), and not leaving early. I hope that this idea of respectfulness comes naturally to all Aggies but if it ever becomes a problem you may be asked to leave the classroom.

AVAILABLE HELP

If at any point in the semester you are not fully understanding the concepts we are covering, please seek help immediately (not 2 months later). Please keep in mind all of the resources available to you:

- *Me (your instructor)* – Feel free to ask questions before, during, or after class. If you still have questions feel free to stop by anytime during my office hours. I want to help you succeed in this course. ***As of 3/23/20, I will be available to answer questions via Zoom during my office hour time.**
- *Help Sessions* - Help sessions are an opportunity for you to ask questions and get help with your homework. These sessions are led by students, where you may come and go, as your schedule allows. Once determined, the schedule will be announced in class, posted on our course webpage, and additionally posted at <http://www.math.tamu.edu/courses/helpsessions.html>. ***As of 3/23/20, help sessions will be moved to Zoom. More details will be disseminated as they are known.**
- *Week-in-Review* – There will be Week-in-Review sessions conducted by Mrs. Angie Allen each week, starting the second week of classes. Each review is open to all Math 142 students to review the topics of the previous week and to provide additional examples. The schedule and problem sets that will be worked during these sessions can be

found at <https://www.math.tamu.edu/~aallen/142spring2020wir.html> *As of 3/23/20, there will be no in person week-in-reviews. A live week-in-review via Zoom will be held during the originally scheduled times.

TITLE IX AND STATEMENT ON LIMITS TO CONFIDENTIALITY

Texas A&M University and the College of Science are committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws provide guidance for achieving such an environment. Although class materials are generally considered confidential pursuant to student record policies and laws, University employees — including instructors — cannot maintain confidentiality when it conflicts with their responsibility to report certain issues that jeopardize the health and safety of our community. As the instructor, I must report (per Texas A&M System Regulation 08.01.01) the following information to other University offices if you share it with me, even if you do not want the disclosed information to be shared:

- Allegations of sexual assault, sexual discrimination, or sexual harassment when they involve TAMU students, faculty, or staff, or third parties visiting campus.

These reports may trigger contact from a campus official who will want to talk with you about the incident that you have shared. In many cases, it will be your decision whether or not you wish to speak with that individual. If you would like to talk about these events in a more confidential setting, you are encouraged to make an appointment with the Counseling and Psychological Service (<https://caps.tamu.edu/>)

Students and faculty can report non-emergency behavior that causes them to be concerned at <http://tellsomebody.tamu.edu>

HIGHLY SUGGESTED HOMEWORK PROBLEMS

Section	Problems
EXAM 1	
Review	See eCampus
3.1	1-45(odd), 49, 51, 61-81(odd)
3.2	1-43(odd), 51, 57, 59, 65, 67, 69
3.3	1-13(odd), 23-33(odd), 37-43(odd), 47, 53, 55
4.1	1-75(odd), 79, 97
4.2	1-35(odd), 41, 43
EXAM 2	
4.3	1-37(odd), 41, 45
4.4	1-73(odd)
5.1	1-41(odd), 45-53(odd), 61, 63, 73, 75, 87, 89
5.2	1-35(odd), 41-45(odd), 57, 63, 71, 73
5.3	1-17(odd), 21, 27, 31
5.4	1-35(odd), 41, 47, 49
5.5	1-29(odd), 43
EXAM 3	
5.6	1-9(odd), 13, 15
6.1	1-47(odd)
6.2	1-45(odd)
6.3	1-9(odd), 17-23(odd)
6.4	1-11(odd, n=10 only), 23-29(odd), 33-41(odd), 67
6.5	1-51(odd), 55-63(odd)
6.6	1-35(odd), 41, 51, 59, 61
6.7 (OPTIONAL)	15-25(odd)
6.6	1-35(odd), 41, 51, 59, 61
6.7 (OPTIONAL)	15-25(odd)