Class times and Locations

- 142.501: TuTh 9:35am - 10:50am, VMS 201
- 142.502: TuTh 11:10am - 12:25pm, VMS 201

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. *Prerequisite*: 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	JoungDong Kim (JD)
Email	jdkim@math.tamu.edu
Office	Blocker 207 ***Note:*** *Office hours are not held in my office. They are held in different rooms listed below.*
Office Hours	Monday, 12:00 - 02:00pm in Bloc 203 (Ava, Jamie, and JD) Tuesday, 01:30 - 03:30pm in Bloc 602 (Jamie) Wednesday, 12:30 - 02:00pm in Bloc 203 (Ava, Jamie, and JD) Thursday, 01:30 - 03:30pm in Bloc 602 (Ava) Friday, 12:00 - 02:00pm in Bloc 205B (Ava and Jamie) or by appointment ***Note:*** *One or both BMTA's will be present. No office hours on exam days.*
Course Page	http://www.math.tamu.edu/~jdkim/math142fall2019
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.

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

TENTATIVE COURSE TOPICS AND CALENDAR OF ACTIVITIES

WEEK OF	TOPIC	SECTIONS
Week1: 8/26 - 8/30	Brief Precalculus Review, Limits and Continuity	Review, 3.1
Week2: 9/2 - 9/6	Limits and Continuity	3.1
Week3: 9/9 - 9/13	Rates of Change, The Derivative	3.2, 3.3
Week4: 9/16 - 9/20	Simple Derivative Rules and Marginal Analysis, Product and Quotient Rules	4.1, 4.2
Week5: 9/23 - 9/27	Review, **EXAM I (3.1-3.3, 4.1, and 4.2)**	
Week6: 9/30 - 10/4	Chain Rule, Derivatives of Exponential and Logarithmic Functions, Analyzing Graphs with the First Derivative	4.3, 4.4, 5.1
Week7: 10/7 - 10/11	Analyzing Graphs with the Second Derivative, Limits at Infinity, Curve Sketching Techniques	5.2, 5.3, 5.4
Week8: 10/14 - 10/18	Absolute Extrema, Optimization	5.5, 5.6
Week9: 10/21 - 10/25	Review, **EXAM II (4.3, 4.4, and 5.1-5.6)**	
Week10: 10/28 - 11/1	Implicit Differentiation and Related Rates, Antiderivatives	5.8, 6.1
Week11: 11/4 - 11/8	Substitution, Estimating Distance Traveled	6.2, 6.3
Week12: 11/11 - 11/15	The Definite Integral, Fundamental Theorem of Calculus Part 2 and Average Value of a Function	6.4, 6.5
Week13: 11/18 - 11/22	Review, **EXAM III (5.8 and 6.1-6.5)**	
Week14: 11/25 - 11/29	Area Between Curves, 6.7 topic: Producers' and Consumers' Surplus, **Thanksgiving**	6.6, 6.7 topic
Week15: 12/2 - 12/6	Review for Final Exam, **Final Exams (include 6.6 and 6.7 topic)**	
Week16 12/9 - 12/13	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.

Grade Breakdown

Activity	Date	Percentage
Homework	Weekly	15%
Exam I	9/26/2019	20%
Exam II	10/24/2019	20%
Exam III	11/21/2019	20%
Final Exam	See below	25%
TOTAL		**100%**

Grading Scale

Range	Grade
$90 \leq$ Average ≤ 100	**A**
$80 \leq$ Average < 90	**B**
$70 \leq$ Average < 80	**C**
$60 \leq$ Average < 70	**D**
Average < 60	**F**

Grade Appeal Policy:
To dispute any awarded grades, the matter must be brought to the attention of the instructor within the next class period after the exam or assignment has been handed back. Beyond this time, the grade received must be accepted.

Homework

Homework assignments will be done online in WebAssign. For important information such as how to purchase access, how to log in and take assignments, the Student Help Request Form, and other WebAssign issues, please see `http://www.math.tamu.edu/courses/eHomework`. I suggest you bookmark this page and visit it before you log in to WebAssign each time. You must log in to WebAssign through the TAMU WebAssign login page at www.webassign.net/tamu/login.html.

Exams

There will be **three in class exams** during the semester. You will need a scantron (full size, Texas A&M scantron) for each exam. Also, you must bring your student ID and approved calculator to each exam. **Your calculator lid must be removed, and the memory must be reset before each exam.** Calculators will be checked before and/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. Additional requirements/information about exams will be given in class closer to exam time. The tentative exam schedule is as follows:

Exam I: Thursday September 26, 2019
Exam II: Thursday October 24, 2019
Exam III: Thursday November 21, 2019

Final Exam

The final exam will be **comprehensive** and is **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
501	TuTh 09:35am class	Friday, Dec. 6, 12:30pm-02:30pm in VMS 201
502	TuTh 11:10am class	Friday, Dec. 6, 03:00-05:00pm in VMS 201

(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 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 or assignment to arrange a makeup. In all cases where an exam/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.
- **Makeup exams** will only be allowed provided the above guidelines are met. According to Student Rule 7, a missed exam **must be** made up during one of the **scheduled makeup times** provided by the Math Department unless there is a University-approved excuse for missing the makeup time as well. If there are multiple makeup exam times, the make up exam should be taken at the *earliest* makeup time for which there is no University-approved excuse. The list of makeup exam times will be available at http://www.math.tamu.edu/courses/makeupexams.html

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/.

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 Student Counseling Service (https://scs.tamu.edu/).

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

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services Building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit http://disability.tamu.edu.

If you require accommodations, please see me as soon as possible so that we can make sure you have the necessary paperwork in order.

Additional Help & Preparing for Exams

BMTA Office Hours

Your BMTAs will conduct office hours each week. The schedule will be posted on course webpage when it is available. These office hours will be an excellent source of help to you especially if you cannot attend my office hours. They will be able to help you with online homework (the practice versions), class notes, Week-in-Review solutions, etc. Either one or both of them will be present during their office hours as well as during my office hours.

Week-in-Review (WIR)

There will be Week-in-Review sessions conducted weekly, 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

http://www.math.tamu.edu/~jdkim/math142fall2019weekinreview

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

Suggested Homework

A list of suggested homework problems is posted on math course webpage. These problems will not be collected for a grade, but it is IMPERATIVE that you do the assigned problems on the suggested homework problems list to prepare for exams. If you need help with any of these suggested homework problems, please attend my office hours, your BMTA's office hours, or a Math 142 Help Session.