TEXAS A&M UNIVERSITY

Syllabus

Course Information

Course Number: MATH 171
Course Title: Calculus I
Section: 503
Time: Lectures MWF 12:00-12:50pm; Recitation T 1:30-2:20pm
Location: Lectures: HECC 209; Recitation over Zoom (link in Canvas, but I will be in ILCB 207 for those who have to be on campus that afternoon anyway)
Credit Hours: 4

Instructor Details

Instructor: David Manuel
Office: Virtual Office Hours over Zoom (link in Canvas)
Phone: (Department) 845-3261
E-Mail: dmanuel@tamu.edu
Office Hours: MW 3-5pm; R 2-4pm or by appointment

Course Description

Analytic Geometry and Calculus (Credit 3) Vectors, functions, limits, derivatives, Mean Value Theorem, applications of derivatives, integrals, Fundamental Theorem of Calculus. Designed to be more demanding that MATH 151.

Course Prerequisites

MATH 150 or acceptable score on TAMU Math Placement Exam. No credit will be given for more than one of MATH 142, MATH 147, MATH 151, and MATH 171

Special Course Designation

This course is a CORE course satisfying 4 hours of the 6 hour Mathematics requirement.

Core Curriculum Objectives

Critical Thinking: The following critical thinking skills will be assessed on in-class quizzes and exams:
- Students will construct vector and parametric equations of lines and understand vector functions and their relationship to parametric equations.
- Students will understand the concept of a limit graphically, numerically, and algebraically, and apply the relationship between limits, continuity, and differentiability in determining where a function is continuous and/or differentiable.

- Students will identify exponential, logarithmic, and inverse trigonometric functions, and compute limits and derivatives involving these classes of functions.
- Students will apply the derivative to mathematically model real world related rate applications, such as calculating the rate at which the distance between two moving objects is changing or the rate at which the volume of a cone being filled with water is changing.
- Students will approximate functions and function values using the derivative and the tangent line.
- Students will Identify and understand indeterminate forms and apply the derivative to calculate limits using L'Hospital's Rule.
- Students will understand and apply the Intermediate Value Theorem and the Mean Value Theorem, and be able to logically determine when these theorems can be used.

Communication Skills: The following communication skills will be assessed on in-class quizzes, exams, and in lecture.
- Students will conceptually understand and explain the precise definition of a limit involving epsilon and delta.
- Students will compute antiderivatives and understand and explain the concept of integration as it relates to area and Riemann sums.
- Students will articulate the relationship between derivatives and integrals using the Fundamental Theorem of Calculus, and evaluate definite integrals using the Fundamental Theorem of Calculus.
- Students will use calculus and logic to visually communicate graphs of functions and their properties, including where a function is increasing/decreasing and in describing the concavity of the function.
- Students will express mathematical concepts both abstractly with equations and in writing.
- Students will explain and/or prove various formulas or theorems used in the course.
- Students will answer questions during lecture concerning topics discussed in class

Empirical and Quantitative Skills: The following empirical and quantitative skills will be assessed on in-class quizzes and exams.
- Students will understand vectors and vector functions, both graphically and quantitatively, and apply them to real world situations involving velocity, forces, and work.
- Students will define the limit definition of the derivative and calculate derivatives using the limit definition, differentiation formulas, the chain rule, and implicit differentiation, with applications to tangent line and velocity problems.
- Students will calculate limits and derivatives with applications to physics such as computing velocity and acceleration.
- Students will determine the maximum/minimum values of functions, including applied optimization problems.

Course Learning Outcomes

This course is the first of a three semester beginning calculus sequence, which is taken, for the most part, by math, chemistry, and physics majors. Upon successful completion of this course, students will be able to:

- Handle routine computations (limits, derivatives, max-min problems, and caluculation of definite integrals using the Fundamental Theorem of Calculus).
- State (write) and apply basic definitions and major theorems. These include, but are not limited to, definitions of limit, continuous function, derivative, definite and indefinite integrals, the Intermediate Value Theorem for continuous functions, the Mean Value Theorem, and the Fundamental Theorem of Calculus.
- Supply simple proofs, e.g., some of the limit theorems, some of the rules of differentiation, and applications of the intermediate and mean value theorems.

Textbook and/or Resource Materials

- *Calculus: Early Transcendentals* by Stewart, published by Cengage Learning, 8th edition (ISBN #9780357300961) which should include Appendix J (vectors and vector-valued functions) and Appendix K (derivatives of vector-valued functions)
- Online Homework (included in the ISBN above).
- Graphing calculators may be useful on some lectures and team assignments, but will not be allowed (or needed) for any individual quizzes or exams.
- To reduce the spread of Covid and to ensure a uniform testing environment for all students, all in-class individual assessments (quizzes and exams) will be done electronically in Canvas and proctored online over Zoom. In order to do this, the following technical requirements are needed:
    - Appropriate hardware (laptop or desktop computer, a second device such as a mobile phone, high-speed internet connection)
    - Appropriate software (PDF reader, Zoom on phone and computer, the latest update on an internet browser-Chrome or Firefox are recommended)

Grading Policy

The course grading will be based on the results of the following:

- **Online Homework**: All online homework will be done using WebAssign. Directions on how to access the course and other important information are posted at www.math.tamu.edu/courses/eHomework. These assignments will be due every Monday at 11:55pm over the previous week's sections. Extensions will only be granted for excused absences for the duration of the assignment (Friday through Monday), though I will be dropping the lowest six grades (out of 34). In addition, suggested homework is posted in Canvas under Class Resources. These problems are for practice and will not be handed in; however, quiz and exam questions may be similar to suggested homework problems (NOTE: If you purchase a student solution manual, it is recommended that you do not open it until AFTER you have attempted the question on your own!)
- **Recitation Activities**: Each Tuesday (except for exam weeks), you will have recitation activities covering the previous week's material. These activities will be a mix of team problems and

individual problems (i.e., quizzes). I will be dropping the lowest grade, so make-up assignments may ONLY be given for university-excused absences, as discussed on the next page, which exceed this number.

- **Class Participation Extra-Credit**: : Blank notes will be posted in Canvas weekly on Fridays. These notes include guidelines for finding key definitions and examples in your textbook and should be completed IN ADVANCE of the lectures. Every MWF lecture beginning Aug 26, you will have opportunities to participate in discussion and answer questions related to these notes. Students who respond to questions with accurate, prepared answers will receive 0.2% FINAL GRADE EXTRA CREDIT for each answer (up to 5%: no credit for inaccurate answers). To earn these points, you must download the notes, work them beforehand, and show initiative in class when given the opportunity!
- **Exams**: There will be three in-class exams. You will be expected to show all of your work on all problems for full credit. The exams will be proctored through Zoom. During each exam, you will be required to set up a streaming video camera (cell phone or USB webcam) in such a way that the proctor will be able to view your workspace during the exam. The proctoring sessions may be recorded. In order to receive credit for this course, you must consent to be proctored in this manner.
- **Final Exam**: The final exam is comprehensive and will be proctored through Zoom as stated above.
- **GradeScope**: The work on all individual assignments and Exams should be scanned to PDF (instructions available in Canvas under "Class Resources") and uploaded to www.gradescope.com. You should create an account in GradeScope (free!) and use the Entry Code provided in Canvas to enroll in the course.

- **Grades ("avg" includes the addition of Class Participation stated above)**

Activity	Date	Percentage
Online HW	Weekly on Mondays	10%
Recitation	Weekly on Tuesdays	10%
Exam I	Tuesday, Sept 22	20%
Exam II	Tuesday, Oct 20	20%
Exam III	Tuesday, Nov 17	20%
Final Exam	Monday, Dec 7 11am-1:30pm	20%
TOTAL		100%

Range	Grade
90% ≤ avg	A
80%≤ avg<90%	B
70% ≤ avg <80%	C
60% ≤ avg <70%	D
avg <60%	F

Course Schedule

Course Topics (Approximate weekly schedule) NOTE: "RA" refers to Recitation Activity

Week	Topics	Sections
1 (8/19-21)	Vectors; Dot Product	J1, J2
2 (8/24-28)	Vector Functions & Parametric Curves; Inverse Functions, **RA1**	J3, 1.5
3 (8/31-9/4)	Limit of a Function; Precise Definition of a Limit; Calculating Limits; **RA2**	2.2, 2.4, 2.3
4 (9/7-11)	Limits at Infinity & Horizontal Asymptotes; Continuity; Derivatives; **RA3**	2.6, 2.5, 2.7
5 (9/14-18)	Derivatives as Functions; Derivative Rules; Product & Quotient Rule; **RA4**	2.8, 3.1, 3.2
6 (9/21-25)	Review; **Exam I Tues 9/22 (J1-J3, 1.5, 2.1-2.8)**; Derivatives of Trig Functions; Chain Rule	3.3, 3.4
7 (9/28-10/2)	Implicit Differentiation & Inverse Trig Derivatives; Derivatives of Logarithmic Functions; Derivatives of Vector Functions; **RA5**	3.5, 3.6, K1
8 (10/5-9)	Tangents to Parametric Curves; Related Rates; Linear Approximation; **RA6**	K2, 3.9, 3.10
9 (10/12-16)	Maximum and Minimum Values; Mean Value Theorem; Derivatives and Curve Shape; **RA7**	4.1, 4.2, 4.3
10 (10/19-23)	Review; **Exam II Tues 10/20 (3.1-3.10; K1-K2; 4.1)**; Curve Sketching	4.4
11 (10/26-30)	L'Hospital's Rule; Optimization Problems; Antiderivatives; **RA8**	4.5, 4.7, 4.9
12 (11/2-6)	Areas and Distances; Definite Integral; **RA9**	5.1, 5.2
13 (11/9-13)	Fundamental Thm of Calculus; Indefinite Integrals; Substitution; **RA10**	5.3, 5.4, 5.5
14 (11/16-20)	Review; **Exam III Tues 11/17 (4.2-4.9; 5.1-5.4)**; Area Between Curves	6.1
15 (11/23-12/7)	Review; **RA11; Final Exam 12/7 11am-1:30pm (Comprehensive)**	

Optional Course Information Items

Technology Support –
- For issues with WebAssign, go to www.math.tamu.edu/courses/eHomework.
- For issues with Canvas, go to lms.tamu.edu or email itshelp@tamu.edu.

Learning Resources –
- *Office Hours:* As stated on the first page, I have office hours MW 3-5pm and R 2-4pm where you can ask questions about the material or just work on homework and get help when needed. I am available at other times via appointment for help or discussion of your performance in class; email me to arrange a Zoom appointment for any of these.

- *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, and additionally posted at mlc.tamu.edu.
- *Week in Review:* Although not followed exactly, you may use the MATH 151 Week in Review for additional help with problem solving (details available soon at mlc.tamu.edu). In addition, I will provide a link to "Week in Review" videos to help with proofs (details in Canvas).

University Policies

Attendance Policy

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to Student Rule 7 in its entirety for information about excused absences, including definitions, and related documentation and timelines.

(INSTRUCTOR'S ADDENDUM) In the current environment, I will NOT require doctor's notes for excused absences; however, I WILL require that all requests for makeups be prefaced with the AGGIE CODE OF HONOR: "An Aggie does not lie, cheat, or steal or tolerate those who do. On my honor as an Aggie, I certify that (*insert reason for excused absence*)." Note that your reason must still fall in the excused absence category described above! Also note that an absence due to a non-acute medical service or appointment (such as a regular checkup) is not an excused absence. Since all in-class assessments will be done online, I hope this will not be an issue regardless. In addition, all lectures will be simulcast over Zoom (link posted in Canvas) so that students who are quarantined will still be able to attend class virtually.

Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to Student Rule 7 in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" (Student Rule 7, Section 7.4.1).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" (Student Rule 7, Section 7.4.2).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See Student Rule 24.)

If you foresee the need to miss an exam due to an excused absence, you must notify me in advance if possible. Make up activities will only be allowed due to excused absences after the first absence and will consist of turning in a subset of the suggest homework for the covered sections (minimum 30 problems-to be announced upon request) within the earlier of one week of the student's return to class OR the day of the next exam.

Academic Integrity Statement and Policy

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

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" (Section 20.1.2.3, Student Rule 20).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu.

Americans with Disabilities Act (ADA) Policy

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 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.

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see University Rule 08.01.01.M1):

- The incident is reasonably believed to be discrimination or harassment.

- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, you will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with Counseling and Psychological Services (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's Title IX webpage.

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in proper self-care by utilizing the resources and services available from Counseling & Psychological Services (CAPS). Students who need someone to talk to can call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at suicidepreventionlifeline.org.

COVID-19 Temporary Amendment to Minimum Syllabus Requirements

The Faculty Senate temporarily added the following statements to the minimum syllabus requirements in Fall 2020 as part of the university's COVID-19 response.

Campus Safety Measures

To promote public safety and protect students, faculty, and staff during the coronavirus pandemic, Texas A&M University has adopted policies and practices for the Fall 2020 academic term to limit virus transmission. Students must observe the following practices while participating in face-to-face courses and course-related activities (office hours, help sessions, transitioning to and between classes, study spaces, academic services, etc.):

- Self-monitoring—Students should follow CDC recommendations for self-monitoring. **Students who have a fever or exhibit symptoms of COVID-19 should participate in class remotely and should not participate in face-to-face instruction.**
- Face Coverings—Face coverings (cloth face covering, surgical mask, etc.) must be properly worn in all non-private spaces including classrooms, teaching laboratories, common spaces such as lobbies and hallways, public study spaces, libraries, academic resource and support offices, and

outdoor spaces where 6 feet of physical distancing is difficult to reliably maintain. Description of face coverings and additional guidance are provided in the [Face Covering policy](#) and [Frequently Asked Questions (FAQ)](#) available on the [Provost website](#).

- Physical Distancing—Physical distancing must be maintained between students, instructors, and others in course and course-related activities.
- Classroom Ingress/Egress—Students must follow marked pathways for entering and exiting classrooms and other teaching spaces. Leave classrooms promptly after course activities have concluded. Do not congregate in hallways and maintain 6-foot physical distancing when waiting to enter classrooms and other instructional spaces.
- To attend a face-to-face class, students must wear a face covering (or a face shield if they have an exemption letter). If a student refuses to wear a face covering, the instructor should ask the student to leave and join the class remotely. If the student does not leave the class, the faculty member should report that student to the [Student Conduct office](#) for sanctions. Additionally, the faculty member may choose to teach that day's class remotely for all students.

Personal Illness and Quarantine

Students required to quarantine must participate in courses and course-related activities remotely and **must not attend face-to-face course activities**. Students should notify their instructors of the quarantine requirement. Students under quarantine are expected to participate in courses and complete graded work unless they have symptoms that are too severe to participate in course activities.

Students experiencing personal injury or Illness that is too severe for the student to attend class qualify for an excused absence (See [Student Rule 7, Section 7.2.2](#).) To receive an excused absence, students must comply with the documentation and notification guidelines outlined in Student Rule 7. While Student Rule 7, Section 7.3.2.1, indicates a medical confirmation note from the student's medical provider is preferred, **for Fall 2020 only, students may use the Explanatory Statement for Absence from Class form in lieu of a medical confirmation. Students must submit the Explanatory Statement for Absence from Class within two business days after the last date of absence.**

Operational Details for Fall 2020 Courses

For additional information, please review the [FAQ](#) on Fall 2020 courses at Texas A&M University.