



Division of Natural and Computational Sciences  
Department of Mathematics  
MATH 2413.01 Calculus with Analytical Geometry I

College Mission

*College is a Historically Black College founded in 1894, by the Colored Methodist Episcopal Church, now the Christian Methodist Episcopal Church (CME). Our mission continues to embody the principles of the Christian Methodist Episcopal Church. The College shall prepare students with competencies in critical and creative thinking related to the knowledge, skills, and abilities as defined in areas of study. Additionally, the College shall provide an environment to inspire intellectual, spiritual, ethical, moral, and social development, which empowers graduates to engage in life-long learning, leadership, and service.*

**Textbooks and/or Electronic Site Required**

Good news: your textbook for this class is available for free online! If you prefer, you can also get a print version at a very low cost. Your book is available in web view and PDF for free. You can also choose to purchase on iBooks or get a print version from OpenStax on Amazon.com. You can use whichever formats you want. Web view is recommended -- the responsive design works seamlessly on any device. If you buy on Amazon, make sure you use the link on your book page on openstax.org so you get the official OpenStax print version. (Simple printouts sold by third parties on Amazon are not verifiable and not as high-quality.)

Calculus Volume 1 from OpenStax, Print ISBN 193816802X, Digital ISBN 1947172131,  
[www.openstax.org/details/calculus-volume-1](http://www.openstax.org/details/calculus-volume-1)

**Required Readings/Resources:**

**Other Requirements:**

Access to Computer or Laptop.

**Course Description:**

MATH 2413 Calculus and Analytical Geometry I presents the first semester of the calculus sequence. Topics include limits, continuity, derivatives of algebraic and trigonometric functions, applications of differentiation, related rates, optimization, indefinite integrals, definite integrals and applications of integration.

**Prerequisites:** MATH 1317 Precalculus

**TEXAS COLLEGE OUTCOMES**

1. Critical Thinking Skills
2. Communication Skills

### 3. Empirical and Quantitative Skills

Week	Topics and Readings	Activities and Due Dates	Due Dates	SLOs
Week 1 9/8-9/12	<b>Chapter 1: Functions and Graphs</b> 1.1 Review of Functions . . . . . 1.2 Basic Classes of Functions . . . . . 1.3 Trigonometric Functions . . . . . 1.4 Inverse Functions . . . . . 1.5 Exponential and Logarithmic Functions	1.1 Exercises #1 – 49 every other odd	9/12	2, Review
Week 2 9/13-9/19		1.2 Exercises #59 – 91 every other odd	9/12	
		1.3 Checkpoint 1.18-1.22; Exercises #113-169 odd	9/19	2, Review
		1.4 Checkpoint 1.23-1.26; Exercises #193-205 odd	9/19	
		1.5 Checkpoint 1.27-1.33; Exercises #229-259 odd	9/19	
Week 3 9/20-9/26	<b>Chapter 2: Limits</b> . . . . . 2.1 A Preview of Calculus . . . . . 2.2 The Limit of a Function . . . . . 2.3 The Limit Laws . . . . .	2.1 Checkpoint 2.1-2.3; Exercises #1-29 odd	9/26	1
		2.1 Checkpoint 2.9-2.10; Exercises # 35,37,46-49	9/26	
		2.2 Checkpoint 2.11-2.20; Exercises #83-103odd	9/26	
		Test# 1 Chapters 1&2	9/26	
Week 4 9/27-10/3	2.4 Continuity . . . . . 2.5 The Precise Definition of a Limit	2.3 Checkpoint 2.21-2.26; Exercises #131-151 odd	10/3	1, 2
		2.4 Checkpoint 2.27-2.30; Exercises #177-183 odd Quiz #1 2.1-2.3	10/3	
			10/3	
Week 5 10/4-10/10	<b>Chapter 3: Derivatives</b> . . . . . 3.1 Defining the Derivative . . . . . 3.2 The Derivative as a Function . . . . . 3.3 Differentiation Rules . . . . .	3.1 Checkpoint 3.1-3.3; Exercises #1-43 odd	10/10	3, 4
		3.2 Checkpoint 3.6-3.10; Exercises # 55-77 odd	10/10	
		3.3 Checkpoint 3.11-3.20; Exercises #107-139odd	10/10	
		Quiz #2 3.1-3.3	10/10	
Week 6 10/11-10/17	3.4 Derivatives as Rates of Change . . . . . 3.5 Derivatives of Trigonometric Functions	3.4 Checkpoint 3.21-3.24; Exercises #151-165 odd	10/17	3, 4
		3.5 Checkpoint 3.25-3.33; Exercises # 175-199 odd	10/17	
		Test #2 – Mid-Term Exam – Chapters 1-3	10/17	
Week 7 10/18-10/24	3.6 The Chain Rule . . . . . 3.7 Derivatives of Inverse Functions	3.6 Checkpoint 3.34-3.41; Exercises #215-247 odd	10/24	3, 4
		3.7 Checkpoint 3.42-3.47; Exercises # 261-297 odd	10/24	
		Quiz #3 3.6-3.7	10/24	

Week 8 10/25- 10/31	3.8 Implicit Differentiation . . . . . 3.9 Derivatives of Exponential and Logarithmic Functions . . . . .	3.8 Checkpoint 3.48-3.49; Exercises #300-309 odd 3.9 Checkpoint 3.50-3.55;  Exercises # 331-353 odd  Test #3 Chapter 3	10/31      10/31	3, 4, 5
Week 9 11/1-11/7	<b>Chapter 4: Applications of Derivatives . . . . .</b> 4.1 Related Rates . . . . . 4.2 Linear Approximations and Differentials . . . . . 4.3 Maxima and Minima . . . . .	4.1 Checkpoint 3.1-3.4; Exercises #1-31 odd 4.2 Checkpoint 3.5-3.11; Exercises #49-55 odd 4.3 Checkpoint 3.12, 3.13; Exercises #93,97,101-121 odd  Quiz #4 4.1-4.3	11/7  11/7 11/7  11/7	3, 4, 5
Week 10 11/8-11/14	4.4 The Mean Value Theorem 4.8 L'Hopital's Rule	4.4 Checkpoint 4.14,4.15; Exercises #153,155 4.8 Checkpoint 4.37-4.44; Exercises # 357-363 odd  Quiz #5 4.4,4.8	11/14  11/14  11/14	1, 3, 4
Week 11 11/15- 11/21	4.9 Newton's Method 4.10 Antiderivatives	4.9 Checkpoint 4.45-4.48; 4.10 Checkpoint 4.49-4.53; Exercises # 465-499 odd  Quiz #6 4.9-4.10	11/21  11/21  11/21	4, 6
Week 12 11/22- 11/28	<b>Chapter 5: Integration . . . . .</b> 5.1 Approximating Areas . . . . . 5.2 The Definite Integral . . . . . 5.3 The Fundamental Theorem of Calculus	5.1 Checkpoint 5.1-5.6; Exercises #1-21 odd 5.2 Checkpoint 5.7-5.13; Exercises #61-67 odd 5.3 Checkpoint 5.14-5.20; Exercises 149-161 odd, 171-183 odd  Test #4 Chapter 4, 5.1-5.3	11/28  11/28 11/28  11/28	6, 7, 8
Week 13 11/25-12/5	Review	Review Exercises	12/5	
Week 14 12/6-12/10	Final Exam		12/10	

- 4. Teamwork
- 5. Social Responsibility

## 6. Personal Responsibility

Furthermore, this course ensures the following institutional objectives:

1. Enhance communicative skills (oral and written)
2. Enhance critical thinking and technology skills.
3. Enhance leadership abilities and spiritual awareness.
4. Create opportunities for professional and pos-graduate pathways.

All learning objectives reflect the Texas College Core Values.

**Academic Excellence:** Developing a culture of curiosity and creativity that will challenge the frontiers of teaching/learning; stimulate research; raise the level of analytical reasoning and inquiry; and enable students to acquire leadership, human relations, communication, and technology skills.

**Integrity:** Instilling the pursuit of character, honesty, and sincerity of purpose as the moral rubrics upon which the behaviors of our graduates and College family are anchored.

**Perseverance:** Implanting diligence, enterprise, and pride in the application of skills, knowledge and abilities developed during the course of study at Texas College.

**Social Responsibility:** Promoting in the College community a conscious awareness that we are all stewards of the resources entrusted to our care.

**Tolerance:** Emphasizing openness to divergent points of view, applying an eclectic approach to rational and analytical thinking.

**Community Service:** Encouraging self-extension in service to others as the heart and soul of our educational enterprise.

### STUDENT LEARNING OBJECTIVES & OUTCOMES

When you have completed your study in this course you should be proficient in meeting the following: objectives as described in the chart below.

Student Learning Outcomes: Upon successful completion of MATH 2413 Calculus and Analytical Geometry I, the student will be able to:

1. Calculate limits when they exist; when limits do not exist, give reasons for their nonexistence.
2. Determine where a function is continuous and/or differentiable, and explain why.
3. Compute derivatives of polynomial, rational, algebraic, exponential, logarithmic, trigonometric, and inverse trigonometric functions.
4. Employ techniques of differentiation, including the product, quotient, and chain rules, and implicit differentiation to find derivatives of functions.
5. Apply differentiation to the study of functions and their graphs, to optimization and related rate problems, and to applications from science and economics.

6. Compute anti-derivatives of polynomial, rational, algebraic, exponential, logarithmic, trigonometric, and inverse trigonometric functions.
7. Interpret Riemann sums as definite integrals and relate definite integrals to areas.
8. Evaluate definite integrals according to the Fundamental Theorem of Calculus.

Instructional Strategies:

- Online (Zoom) Presentations and Discussions
- Textbook Reading
- Individual Problem Solving
- Relevant videos

Student Activities:

- Participation
- Problem Solving/Free Response Questions
- Internet research
- Midterm and Final Exams
- Chapter Exams
- Laboratory Assignments

Method of Instruction:

- Web-based environment
- Class discussion to examine the topics on the course outline.
- Required readings and homework assignments
- Use of online statistical calculators and graphing utilities to facilitate a deeper understanding of the readings and the class discussions.

Note: Designated time will be given to each student to discuss student progress. See your instructor for more information.

SOFTWARE AND SUPPLIES

Software and Programs:

1. Access to websites as referenced in class. Students attempting to gain access through cell phones, Mac books, or outdated equipment may experience difficulties with certain websites or videos. It is the student's responsibility to locate a computer lab with viable equipment.
2. Access to JICS. It is the student's responsibility to become familiar with JICS.
3. Access to Zoom. It is the student's responsibility to become familiar with Zoom and to be able to sign in to meetings.
4. Documents in this course will be in Word format. PowerPoints will also be used.

5. Students should be prepared to back up files on their own Flash Drive. Work should be saved more than once, as it is not the instructor's responsibility if technology issues suddenly occur and information is lost.

## COURSE POLICIES AND PROCEDURES

### SUBMISSION OF ASSIGNMENTS

Students are required to have access to internet that is JICS compatible. All assignments must be submitted on time in JICS. Submitting assignments through email is discouraged. If extenuating circumstances prevent you from turning in an assignment, please contact the Instructor before the due date. Students are expected to submit assignments on the due date. Late work will be accepted without penalties only if emergencies are documented or Texas College is experiencing difficulties. Otherwise, late work will not be accepted. No excuses will be accepted, including difficulties with technology.

Please include your calculations with your answers to obtain full credit. No credit will be given if the final answer is given without the necessary intermediate steps.

There are several methods for uploading your work to the course space.

- If you have an all-in-one printer/scanner/copier, then simply scan each page into your computer and upload the resulting .pdf file(s) as an attachment to this assignment.
- You can take a picture of your work with your mobile phone or tablet, and upload the jpeg(s).
- You can use an app such as Adobe Scan to take a picture with your phone and convert it into a .pdf file.

\*This does not constitute an endorsement of this app. It is simply provided as an example.

### ATTENDANCE POLICY

The student is responsible for attending all lectures, seminars, laboratories, and field work for each registered class. A student will be permitted one unexcused absence per credit hour of the course by the instructor in which he/she is enrolled. Any student whose unexcused absences exceed the number permitted by the instructor may be vulnerable to failing the course. The administration endorses student participation in activities and exercises that represent the college to the external publics. However, students are still responsible for the successful completion of coursework. Following are examples of excused absences and acceptable documentation considered by administration. Excused Absences and the required documentation can be found on page 35 of the College Catalog. The Catalog can be found on the Texas College Website under the Office of Academic Affairs. The student is responsible for attending all lectures, seminars, laboratories, and field work for each registered class—beginning with the first day of class scheduled—in order to verify registration with instructors and to complete all work assigned for the course. If a student does not attend class during the first week (first five instructional days) of the semester, or does not attend five consecutive class

sessions, and does not give prior notification to the instructor of reasons for absence, and intent to attend the class, the student may be recommended to the Vice-President for Academic Affairs to be administratively withdrawn from the course. The instructor should read the rules governing class attendance and absences to each of the assigned classes at the beginning of each semester.

These attendance regulations will be strictly enforced.

The student will be held accountable for adhering to the College Attendance Policy. Instructors are not obligated to allow students to submit late assignments because of their absence unless the absences have been officially approved. An officially approved absence, however, gives the individual who missed the class an opportunity to turn in the assignment late but in no way excuses the student from the work required. Official excuses are granted by the vice president for student affairs for authorized College activities, verified personal illness, or illness or death in the student's immediate family. Students should understand that absences may jeopardize their grades. A student will be permitted one unexcused absence per credit hour of the course in which he/she is enrolled. Any student whose unexcused absences exceed the number permitted may, at the discretion of the instructor, be assigned a grade of "F" or be dismissed from the class.

Absences will count from the first official date of classes and not from the first day the student attends. It is the responsibility of the instructor to keep an accurate attendance record of all students enrolled. Students receiving veterans' benefits are required to attend classes according to the regulations of the Veterans Administration in addition to those regulations set by the College for all students.

## ACADEMIC HONESTY

### Academic Integrity Policy:

Texas College believes that strength of character is as important as academic achievement, therefore, the College expects everyone in the academic community to maintain personal integrity in academic matters and not to contribute or condone the dishonesty of others. Scholastic dishonesty (which includes any form of plagiarism, cheating, falsification of records, and collusion with others to defraud) is improper and will not be tolerated. Texas College reserves the right to apply disciplinary actions to a student who has committed scholastic dishonesty. For further information, see the Texas College Catalog found on the Texas College website ([www.texascollege.edu](http://www.texascollege.edu)) page 33, Item: Academic Integrity Policy.

## COVID-19 POLICY

### COVID -19 Vaccination Policy:

Texas College, as a private, faith-based institution, strongly suggests that, effective for the Fall, 2021 term, all students, faculty and staff provide evidence that they have been fully vaccinated. Individuals who have religious beliefs, medical reasons, and/or philosophies (or are generally indifferent to taking the vaccination) will be required to provide and/or sign a statement to that effect, which they believe prohibits them from being fully vaccinated. This information is available at <https://www.texascollege.edu/covid-19/information/> as well as <https://www.texascollege.edu/fall-2021>.



### INSTRUCTIONAL METHOD

Texas College observes remote synchronous instruction defined as a two-way, real-time/live, virtual instruction between instructors and students when students are not on campus and observing COVID-19 distance requirements.

In this method, the required amount of instructional time related to courses will be scheduled each day, and communication is generated when attendance is recorded daily at a locally selected time utilizing school-purchased Software. Synchronous instruction is provided through a computer or other electronic device or over the phone. The instructional method will address the course and degree program requirements. If a student who is originally scheduled to receive instruction through the on-campus or synchronous instructional method is not present at the designated official course time, the student will not be considered present for the day by engaging through the remote synchronous method.

In the remote synchronous instructional method, student engagement is measured daily, and attendance is assigned based on the student's completion of that day's course engagement measure. Students who do not complete the daily measure of engagement are to be counted absent for that day, and that absence cannot be changed to remote synchronous present if the student completes the engagement measure on a later date.

Attendance is measured as synchronous interaction for scheduled courses. Attendance depends on the active participation of students whether virtual (synchronous) or in class (non-synchronous). Students are expected to attend online sessions just as students will do in a face-to-face means of instruction.. Appropriate lighting is encouraged for better engagement when the video feature of Zoom is in use.

### PROGRAM FOR WHICH THE COURSE IS REQUIRED

Applied Statistics is a requirement for Mathematics Majors which leads to a Bachelor of Science (BS) Degree in Mathematics. This course is also required for students seeking Bachelors degrees in Business Administration, Criminal Justice, Social Work, Sociology, EC-6 Generalisr, 4-8 Mathematics, and 7-12 Mathematics.

### METHOD OF STUDENT EVALUATION

Tests are typically composed of multiple choice problems and vocabulary questions and free response problems aimed at using critical thinking.

Assignment Type	Percentage of Grade
Homework	20%
Quizzes	20%
3 Tests	30%
Project	10%
Final Exam	20%
Total	100%

Grading Rubric:

A = 90-100	Transformative (and submitted on time)
B = 80-89	Proficient
C = 70-79	Developing
D = 60-69	Beginning
Below 60	Not Submitted on time

\*Grade of C or above is required to pass the course. The course must be repeated for Mathematics Majors if grade is a D or below.

ASSESSMENT

Performance based standards for each learning opportunity will be explained prior to each assignment. Students will work toward successful attainment of all standards. The assessment is designed to require use of high level thinking skills and to provide authentic opportunities for students to demonstrate an understanding of statistical methods and problem solving strategies.

SPECIAL NEEDS LEARNING

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of the Vice President for Academic Affairs at (903) 593-8311 x. 2335 for accommodations as early as possible in the term.

DIVERSITY STATEMENT

Texas College is committed to creating a community that affirms and welcomes persons from diverse backgrounds and experiences and supports the realization of their human potential. We recognize that there are differences among groups of people and individuals based on ethnicity, race, socioeconomic status, gender, exceptionalities, language, religion, sexual orientation, and geographical area. All persons are encouraged to respect the individual differences of others.

Caveat:

In the event of extenuating circumstances, the schedule and requirements for this course may be modified.

TECHNOLOGICAL STATEMENT

This course is infused with technology in order to:

- Participate in Courses Synchronously
- To provide access for course information
- Use the Internet and electronic databases to conduct searches for research projects

- Create multimedia presentations to present class projects to teachers and peers
- PowerPoint Presentations

### WRITING ACROSS THE CURRICULUM

Strong communication skills are critical for professionals. In an effort to maintain a commitment to developing effective writing skills for all students, all writing assignments will be evaluated for overall communicative competence. The following will be considered when grading written assignments:

- Word-processed (12 font), double-spaced, one inch left, right, top and bottom margins
- Content
- Clarity and Organization
- Source(s)
- Depth of thought/Originality
- Technology and Delivery
- Grammar and mechanics

### PROFESSIONAL ORGANIZATIONS

[American Statistical Association \(ASA\) \(amstat.org\)](http://amstat.org)

[Association of Data Scientists \(adasci.org\)](http://adasci.org)

Mathematical Association of America (MAA) [MAA](http://maa.org)