Syllabus

Course Title: Calculus with Analytic Geometry I

Calculus with Analytic Geometry I: MAC 2311, CRN 84797, Fall 2026

4 Credit Hours, 4 Contact Hours

Pre-requisites: Minimum grade of "C" in MAC 1140 and in MAC 1114. Placing into MAC 2311 by only placement test scores requires permission of the Mathematics Division Chair. To receive permission, the student who has not successfully completed MAC 1114 (Trigonometry) must verify successful completion ("C" or higher) of a trigonometry course at the high school level or higher.

Contact Information

Instructor

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Response Time:
Email – Within 1 business day
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Division Chair

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Course Information

Catalog Description:

In this course, students will develop problem-solving skills, critical thinking, computational proficiency, and contextual fluency through the study of limits, derivatives, and definite and indefinite integrals of functions of one variable, including algebraic, exponential, logarithmic, and trigonometric functions, and applications. Topics will include limits, continuity, differentiation and rates of change, optimization, curve sketching, and introduction to integration and area. NOTE: For the Calculus sequence, the math faculty at GCSC strongly advises that students complete the entire sequence at a single institution. Course content may vary depending on the institutions. Completing the sequence assures that no content is lost in transfer.

Student Learning Outcomes:

SLO1. Students will calculate a limit, derivative, or integral using appropriate techniques.
SLO2. Students will determine the continuity and differentiability of a function.
SLO3. Students will use limits and derivatives to analyze relationships between the equation of a function and its graph.
SLO4. Students will apply differentiation techniques to model and solve real world problems.
SLO5. Students will use integrals and the fundamental theorem of Calculus to analyze the relationship between the integral of a function and the related area.

Course Materials & Resources:

1. **Required Textbook:** *Calculus: Early Transcendental Functions, 8th Edition*, Ron Larson and Bruce Edwards, Cengage, © 2024, ISBN 978-0-357-75932-5 or 978-0-357-75933-2
2. **TI-83 or TI-84 Graphing Calculator:** A graphing calculator is required. If you wish to use a calculator besides the TI-83 or TI-84 on your tests, you must receive prior approval from the instructor. *TI-89, TI-92, and other calculators that perform symbolic manipulation will not be permitted on tests. Cell phone calculators will not be permitted.* Each student is expected to have their own calculator.

Delivery Method:

This course meets face to face. Course material, assignments, and announcements may be offered via Canvas as a supplemental approach to learning at the discretion of the instructor. Please make sure that you have access to a computer with a webcam and internet service in the event a change in course delivery is needed.

Student Expectations

In this course, communication and feedback might occur through various channels, such as GCSC email, Canvas Inbox, Canvas Announcements, Canvas Discussions, Microsoft Teams or

Zoom, assignment feedback, and instructor office hours. Review the statements below so that you understand the expectations for communication.

As a student at Gulf Coast State College, you are expected to:

- **Adhere to Course Guidelines:** Follow the guidelines detailed in the course syllabus, along with any additional instructions provided by the instructor. This includes understanding and complying with the course objectives, grading criteria, and academic policies.
- **Maintain Regular Contact:** Keep in touch with your instructor and classmates via your GCSC email or other designated communication channels. Regular contact helps clarify doubts, share ideas, and foster a collaborative learning environment.
- **Active Participation:** Engage actively in class discussions and submit assignments on time. Your active participation is crucial for your academic success and contributes to a vibrant learning community.

As your instructor, my commitment to you is to:

- **Provide Timely Feedback:** I will review and provide feedback on your assignments and submissions promptly. My goal is to help you understand your strengths and areas for improvement, which is crucial for your academic growth.
- **Respond Via Canvas Inbox:** I will respond to your emails or messages within 24-48 hours (excluding weekends), unless otherwise noted. I understand the importance of clear and timely communication in addressing your questions and concerns.
- **Maintain Weekly Office Hours:** I will maintain regular weekly office hours, but I can also be available by appointment. This is to ensure I'm available for any questions or concerns that may come up during the week.

Course Schedule

The semester is divided into 5 units. The contents of each unit, referenced by textbook sections, are given below. Typically, two to three sections will be covered per week. For each section, students will be assigned homework. Graded take-home quizzes will be assigned periodically. A unit test will be given at the end of each unit, and a comprehensive final exam will be given at the end of the semester.

A detailed daily schedule, which includes testing dates and a list of assigned homework problems, will be provided to students on the first day of class.

Unit 1

Section 2.2: Finding Limits Graphically and Numerically (SLO1)
Section 2.3: Evaluating Limits Analytically (SLO1)
Section 2.4: Continuity and One-sided Limits (SLO1, SLO2)
Section 2.5: Infinite Limits (SLO1)

Section 3.1: The Derivative and the Tangent Line Problem (SLO1, SLO2)

Unit 2
Section 3.2: Basic Differentiation Rules and Rates of Change (SLO1)
Section 3.3: Product and Quotient Rules and Higher-Order Derivatives (SLO1)
Section 3.4: The Chain Rule (SLO1)
Section 3.5: Implicit Differentiation (SLO1)
Section 3.6: Derivatives of Inverse Functions (SLO1)
Section 3.8: Newton's Method (SLO3)

Unit 3
Section 3.7: Related Rates (SLO4)
Section 4.1: Extrema on an Interval (SLO2, SLO3)
Section 4.2: Rolle's Theorem and the Mean Value Theorem (SLO2, SLO3)
Section 4.3: Increasing and Decreasing Functions and the First Derivative Test (SLO3)
Section 4.4: Concavity and the Second Derivative Test (SLO3)
Section 4.5: Limits at Infinity (SLO1)
Section 4.6: A Summary of Curve Sketching (SLO3)

Unit 4
Section 4.7: Optimization Problems (SLO4)
Section 4.8: Differentials (SLO4)
Section 5.1: Antiderivatives and Indefinite Integration (SLO1)
Section 5.2: Area (SLO5)
Section 5.3: Riemann Sums and Definite Integrals (SLO5)
Section 5.4: The Fundamental Theorem of Calculus (SLO1, SLO5)

Unit 5
Section 5.5: Integration by Substitution (SLO1, SLO5)
Section 5.6: Indeterminate Forms and L'Hôpital's Rule (SLO1)
Section 5.7: The Natural Logarithmic Function: Integration (SLO1, SLO5)
Section 5.8: Inverse Trigonometric Functions: Integration (SLO1, SLO5)
Section 5.9: Hyperbolic Functions (SLO1, SLO5)

Grading

GCSC Grading Scale

All grades will be posted in the student grade book in Canvas and will be assigned according to the following scale:

A	90%-100%
B	80%-89%
C	70%-79%

D 60%-69%
F 59% and below

Calculation of Grades

1. There will be five (5) unit tests and a final exam. The unit tests will be announced in advance, will count equally, and will be returned. The final exam will not be returned. There are no exemptions from the final exam. At the option of the instructor, unannounced "pop-quizzes," graded homework, or group activities may be given. If so, the average of those grades will count as an additional unit test. Therefore, the number of grades counted as a unit test may be six (6). The student is expected to keep up daily with the assigned work. **Although a graphing calculator is required for this course, students will be expected to demonstrate mastery of differentiation and integration techniques without the use of a calculator.**
2. The unit test grades and the daily/quiz average comprise 75% of the grade for the course. (If the instructor includes a daily/quiz average, the weight of this average will be equal to the weight of one unit test.) The weight of each item on a unit test will be determined by the instructor. All students will be required to take a comprehensive final exam, which comprises 25% of the grade for the course. The following scale is used to convert the numerical average to a letter grade: A(100-90), B(89-80), C(79-70), D(69-60), and F(59-0).
3. At the discretion of the instructor, the final exam score can substitute for the lowest unit test grade, if that substitution improves the student's final average.
4. Mathematics Division policies allow no take-home tests, no extra credit assignments, and no curving of grades.
5. Students will not be allowed to leave a testing situation (such as a unit test, midterm, or final exam) and come back at a later time to finish the test.
6. Students will not be allowed to retake a unit test, midterm, or final exam.

Course Policies

Accessibility Statement

Gulf Coast State College supports an inclusive learning environment for all students. If there are aspects of the instruction or design of this course that hinder your full participation, reasonable accommodations can be arranged. Prior to receiving accommodations, you must register with Student Accessibility Resources. Appropriate academic accommodations will be determined based on the documented needs of the student. Please visit GCSC's Student Accessibility Resource (SAR) webpage to learn more. For information regarding the registration process, email sar@gulfcoast.edu or call 850-747-3243.

Attendance Policy

Regular class attendance and participation are significant factors that help to promote success in college. Students are expected to attend all class meetings of all courses for which they are registered.

You are expected to know the instructor's specific attendance policy, as stated in the syllabus for each course. In the event of absence, you should contact your instructor as soon as possible to indicate the reason and to inquire whether make-up work is possible. (Make-up work is offered solely at the discretion of your professor.)

If your absences in a class become excessive, as stated in the course syllabus, your professor may contact you, indicating that further absence may result in your withdrawal from the course. Your professor can withdraw you from a course for excessive absences without your permission. **The instructor reserves the right to withdraw students who have been absent for 1/8 of the course or more.**

Instructors will monitor attendance at the beginning of each semester. If you are not in attendance during this period, you may be withdrawn from the course. You will be financially responsible for the course and a "W or NS" will appear on your transcript. Withdrawal from a course may also have implications for financial aid.

Make-Up Work Policy

No quizzes will be made up. If you miss a unit test and you have a valid, documented excuse, the instructor has the option to allow you a make-up test or to use your final exam score in the place of the first missing unit test score. If you have not missed any unit tests, the instructor, at his/her discretion, may opt to replace the lowest unit test score with the final exam score. Take-home tests are not allowed.

Withdrawal Policy

Two withdrawals are permitted per credit course. After that, a grade will be assigned. Please be concerned about withdrawals. When admitting students into certain programs, universities may calculate withdrawals as grades. It is your responsibility to verify the effects of enrollment and/or withdrawal upon your financial assistance (financial aid, scholarships, grants, etc.). There are two kinds of withdrawals---student and administrative.

- *Student Withdrawal (W1)* - Students wishing to withdraw must complete the online Student Withdrawal Form before the scheduled withdrawal deadline as published in the College catalog. Student withdrawals initiated prior to the scheduled withdrawal deadline will be recorded as a grade of “W.” The withdrawal deadline for an off-term or condensed term is one week after midterm.
- *Administrative Withdrawal (W2)* – A faculty member may withdraw a student up to the published withdrawal deadline for violation of the class attendance policy in which case

the student will receive a grade of “W.” The withdrawal deadline for an off-term or condensed term is one week after midterm.

Students cannot withdraw from developmental studies courses (college-preparatory classes) after the drop/add period without written permission from their instructor and/or their academic advisor.

Academic Integrity

Honest participation in academic endeavors fosters an environment in which optimal learning can take place and is consistent with the college’s mission. Academic misconduct, including cheating or plagiarism, is destructive to the spirit of an educational environment. GCSC professors report every instance of student academic misconduct to the college for inclusion on the student’s records.

Most course syllabi include an academic honesty policy and the consequences for violating this policy. Familiarize yourself with course policies regarding authorized or unauthorized use of AI to avoid the pitfalls of academic dishonesty.

The following definitions will apply:

"Cheating"

includes but is not limited to use of any unauthorized assistance in taking quizzes, tests, or examinations; dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; the acquisition without permission of tests or other academic materials belonging to a member of the College's faculty.

"Plagiarism"

includes, but is not limited to, the use by paraphrase or direct quotation of the published or unpublished work of another person without full and clear acknowledgment as well as the purchase of papers or projects. It can also include overuse of an editing program like Grammarly or submitting work written by an Artificial Intelligence (AI) generator like ChatGPT. Make certain to consult your course syllabi for your instructor's guidelines of AI material.

"Self-plagiarism"

occurs when a student submits the same or considerably similar document to fulfill requirements in different classes. For example, if a student submits a term paper in Religion they originally wrote for an English class, this is self-plagiarism. Once a paper receives a grade in one class, it cannot be submitted again for another class.

"Generative Artificial Intelligence (AI)"
is technology that uses machine learning to create new content, such as text, images or code, based on user input. These systems are trained on vast amounts of data, including large language models and image or code generators. Common examples include ChatGPT, GitHub, Copilot, Google Gemini, Perplexity, and the Grammarly AI function.

Sanctions for incidences of academic misconduct, depending on the severity of the incidence and/or its repetition, may range from receiving an F grade (or 0) for the test, assignment, or activity, to failure of the course, to suspension or dismissal from the college.

Classroom Recording

In accordance with federal and state privacy laws, students may record class lectures for their own personal educational use, in connection with a complaint to the college, or as evidence in internal or external legal proceedings. Students may not publish or upload the recordings or any components thereof without the knowledge and written permission of the faculty member. Failure to obtain permission to publish could lead to the students' having to pay damages, attorney fees, and court costs. For more information about what can be recorded, please see the guidelines in the GCSC Student Handbook.

Generative Artificial Intelligence (AI) Policy

The use of generative AI tools in academic work requires clear guidelines to maintain academic integrity. Please review the policy selected for this course regarding the use of AI tools such as ChatGPT, Copilot, Grammarly's AI features, and similar platforms for assignments, research, and other coursework.

See the student handbook for further information. Students with questions about acceptable use should consult their instructor.

Prohibited Use of AI

The use of AI-generated content is strictly prohibited in all assignments, coursework, and throughout all stages of the work process, such as brainstorming, outlining, or drafting. This includes but is not limited to, tools such as ChatGPT, Copilot, and Grammarly's AI function. Use of AI tools will be treated as a violation of academic integrity and may result in penalties, including a zero on the assignment and additional disciplinary actions as outlined in the college's academic integrity policy.

Anti-Discrimination Policy

Gulf Coast State College does not discriminate against any person in its programs, activities, policies or procedures on the basis of race, ethnicity, color, national origin, marital status,

religion, age, gender, sex, pregnancy, sexual orientation, gender identity, genetic information, disability, or veteran status. All questions or inquiries regarding compliance with laws relating to non-discrimination and all complaints regarding sexual misconduct or discrimination may be directed to Amanda Reed, Executive Director of Human Resources/Title II/504/Title IX Coordinator and Employment Equity Officer, Gulf Coast State College, 5230 W. US Highway 98, Panama City, FL 32401; 850-769-1551, ext. 3516. Rules, policies, fees, and courses described in this catalog are subject to change without notice.

Syllabus Policy

For any syllabus posted prior to the beginning of the term, the instructor reserves the right to make minor changes prior to or during the term. The instructor will notify students via e-mail or Canvas announcement when changes are made in the requirements and/or grading of the course.

Student Support Resources

Gulf Coast State College is committed to providing you with the resources you need for success as a student and beyond. View all the academic and student support resources provided at GCSC on the Student Services web page.

Course Technology & Support

To successfully participate in online aspects of this course, students must have basic computer and digital information literacy skills and meet the following technology requirements:

- **Computer:** Up-to-date web browser that supports the Canvas learning management system; please refer to the system requirements for compatibility and information on using the Canvas app on mobile devices.
- **Internet Speed**: Minimum bandwidth of 8 Mbps upload/download speed to effectively engage in online activities and access multimedia.
- **Office 365 software:** Available for free download through GCSC Information Technology Services (ITS).

If you need technical support, contact the ITS Help Desk, available 24/7 at (850) 913-3303.

Additional Encouragement and Resources

What to bring to class every day: Graphing calculator, paper, pencil, graph paper, willingness to participate and to learn.

Outside of class: Studying requires discipline, tenacity, and hard work. View this course as a job. During a regular Fall or Spring term, students should plan to spend at least 8 to 12 hours per week outside of class working the homework assignments and quizzes. During a condensed

8-week Summer term, this amount of time per week doubles. Attentiveness to detail and alertness are essential. Students are expected to take responsibility for their learning.

Available help:

1. **Your Instructor:** Full-time faculty have posted office hours on their schedules. Students having difficulty are strongly encouraged to see the instructor for additional help.
2. **Math Lab:** Math tutors are available face-to-face and virtually via the Math Lab. There is no charge for Gulf Coast State College students. See the GCSC Math Lab website for hours of operation.
3. **Course Videos:** These videos can be viewed through our Canvas course webpage.
4. **Canvas Webpage:** Your instructor will post useful information and links in Canvas.
5. **Counseling Center:** The Counseling Center is located on the first floor of Student Union East.
6. **Support Materials Accompanying the Textbook:** CalcChat website.
7. **Communication through Canvas.** Students are encouraged to email one another through Canvas and to organize study groups that meet virtually or in public locations. Students should NOT invite people they do not know well to their homes.