MAC 2311C: Calculus with Analytic Geometry 1

Mathematics Department, University of Central Florida

Credit Hours: 4

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Instructor Information

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Teaching Assistants

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Course Information

- Term: Spring 2024
- Course Number & Section: MAC2311C_CMB-24Spring 00194
- Course Name: Calculus with Analytic Geometry 1
- Credit Hours: 4
- Class Meeting Days: Monday/Wednesday
- Class Meeting Time: 12:00 pm to 1:20 pm
- Class Location: CB2 101

- Course Modality: M-Flex
- Course Attribute (if applicable): Flipped Mode

Enrollment Requirements

Course Prerequisites (if applicable): Appropriate score on the UCF Math Placement Exam, or MAC 1140 with a C (2.0) or better and MAC 1114 with a grade of C (2.0) or better, or score of 3 or better on the Calculus AB Advanced Placement Exam, or C.I.

Course Description

Analytic geometry; limits, continuity, differentiation of algebraic and trigonometric functions; applications of derivatives; integration and the fundamental theorem of calculus; applications of definite integrals. Not open to students with credit in MAC 2241, The "NC" grading policy applies to this course.

Course Purpose

This course will introduce students to limits, derivatives, and integrals for functions of a single variable. The course will prepare students for MAC2312 and other courses that use derivatives and integrals as well as those that require critical thinking.

Course Materials and Resources

Required Materials/Resources

- Calculus Volume 1 from Openstax
- Knewton ALTA access code (online homework system)

Third-Party Accessibility and Privacy Statements

We use the third party apps: Knewton ALTA. See below their Privacy Statements.

- Knewton ALTA

Student Learning Outcomes

Students will be able to understand the concepts and techniques of differential and integral calculus, and to improve problem solving and critical thinking skills. Upon successful completion of the course, the following learning outcomes are expected:
• Student understands limits and is able to compute limits including limits at infinity.
• Student understands continuity and is able to use properties of continuous functions.
• Student understands differentiability, is able to use properties of differentiable functions, and is able to compute derivatives efficiently using the chain rule and implicit differentiation as needed.
• Student can solve word problems in related rates and interpret the results.
• Student can determine the relative and absolute extreme values of a function and solve applied optimization word problems and interpret the results.
• Student can sketch graphs of functions, determining where a function is increasing/decreasing, concavity, and asymptotes at infinity.

- Student can use the Fundamental Theorem of Calculus.
- Student understands integrals and can use them to solve applied problems

Four Before Me

You are responsible for reading and abiding by the Four Before Me policy for this course. If you do not abide by this policy your emails and questions will not be answered in the swiftest fashion.

Course Activities

To accomplish the student learning outcomes, the following assignments are required:

Lectures	There are three ways students can access the lectures: participation in person in the live class on Mondays and Wednesdays from 12:00 to 1:20 pm in CB2 101, watching the live class online in real time, and watching the recording posted in webcourses. Your lecture attendance points will be assigned based on your familiarity with the material covered in the lecture measured via *lecture quizzes*.
Recitations	Mandatory recitations will meet on Fridays at the posted time for your recitation section. You will be given a worksheet with problems during each session that you will work on in groups and the solutions will be discussed at the end of the recitation. Your participation points will be assigned based on your active participation in the discussions.
Weekly Quizzes	Weekly quizzes will be given in Recitation on Friday. You will be assessed on your ability to clearly write and demonstrate proper usage of mathematical content and notation to solve problems.
MALL Hours	Every student is required to spend two hours every week in the MALL engaged in course related activities. Your lab hour points for each week will be assigned based on your participation in lab activities for at least two hours. *This is an all-or-nothing grade, being below two hours will result in a score of 0; working on material that is not related to this course will result in a score of 0.*
Pre-Lecture Tutorial	Knewton Alta adaptive online work is an essential component of the course. Timely completion of each assignment is critical for your success in this course. More information about Knewton Alta is given below on the webpage.
Showcases	Showcases will assess your understanding of the concepts and your ability to deploy the tools of the course to solve problems. They will be administered in the MALL.

Activity Submissions

For assignments where you are required to submit electronically, you will be asked to submit a pdf. In these assignments, if the file cannot be read by the GTA, you will earn a 0. There will be no acceptance of late work, timely delivery of materials is expected.

Active Participation

You are required to have active participation in several components.

- Lectures - where we dive deep in to our topic of the day, and will have some time set aside for breakout discussions

- Recitation - where you will be actively working in groups on conceptual problems, your GTA will lead a discussion
- MALL Lab Hours - where you will go to work on course material, GTAs and ULAs will be present to assist with questions

To encourage you to actively engage in these materials, some portion of your grade will come from these assignments. It is the expectation that you will complete them all weekly. Because active engagement and discussion is part of the requirement, there is no way to make-up credit when missing the activity.

Note, Active Participation is not equivalent to attending. You can attend and be awarded zero XP for an assignment if any GTA sees you are not actively working on task during Recitation or MALL hours; or by not submitting your quiz in Lecture.

Make-up Exams and Assignments

Per university policy, you are allowed to submit make-up work (or an equivalent, alternate assignment) for authorized university-sponsored activities, religious observances, or legal obligations (such as jury duty). If this participation conflicts with your course assignments, your GTA will offer a reasonable opportunity for you to complete missed assignments.

The make-up assignment and grading scale will be equivalent to the missed assignment and its grading scale. In the case of an authorized university activity, it is your responsibility to show your GTA a signed copy of the Program Verification Form for which you will be absent, prior to the class in which the absence occurs. In any of these cases, please contact your GTA ahead of time to notify them of upcoming needs.

Outside of the above, there will be no make-up assignments for any circumstances. Note this includes personal travel plans, medical reasons, and personal or family emergencies.

Assessment and Grading Procedures

You will earn points for each activity that you do, here is a summary of the activities:

Activity	Calc XP Per Assignment	Total Semester Calc XP
Pre-Lecture Tutorials	100	4600
Lecture Quizzes	50	1450
Recitation Participation	100	1400
MALL Hours	100	1300
Weekly Quizzes	100	1300
Showcases	1500	6000
Final Showcase	3000	3000

Upon adding up all over your XP, your letter grade will be determined as follows:

Total Calc XP	Letter Grade
14500 or more	A
14000 - 14499	B+
13000 - 13999	B
12500 - 12999	C+
11500 - 12499	C
Below 11500 **AND** NC Criteria Met	NC
Below 11500 **AND** NC Criteria **NOT** Met	F

NC Criteria

The intent of the "No-credit" (NC) grade is to encourage struggling students to remain in class and work hard, rather than withdrawing midway through the semester. By completing the course, the student's exposure to all the class material should allow them to perform better when repeating the class. No course credit is given for an NC grade, nor will it satisfy any requirements or subsequent courses' prerequisites. However the student's UCF grade point average will not be penalized for the NC. The NC grade will be given in place of an F when the following criteria are met:

- Student misses no more than three Recitation Sessions after the add deadline
- Student earns 0 Calc XP on no more than five Pre-Lecture Tutorial assignments after the add deadline AND earns at least 2500 Pre-Lecture Tutorial Calc XP
- Student takes at least 3 Showcases
- Student takes the Final Showcase

Pre-Lecture Tutorials (Knewton ALTA)

We are going to use a fully integrated adaptive learning courseware called Alta. It's designed to work the way you learn - by completing assignments. All of your course material, including text instructions, videos, animations, and worked examples, is presented to you in Alta at the moment you need it. Once you begin an assignment, Alta recognizes pretty quickly what you
know and do not know, so will adapt the assignment dynamically to your specific learning level.

When Alta identifies a knowledge gap from your past, it will give you instructional support and a few extra questions until you've shown that you understand the concept and can demonstrate proficiency by completing the assignment. Because Alta is adapting to your personal learning, some of you will complete the assignment quickly, and some of you may take longer. (You'll see this in your progress bar.) While you have the option to leave the instructional support (refresher) early, please note doing so will not remediate your knowledge gap – requiring you to do more practice outside of Alta.

Guessing answers is highly discouraged. Guessing will only mess with Alta's ability to recommend the right content for you and could create a longer assignment experience.

All assignments will have due dates. For each homework assignment you will earn a grade equal to the mastery you reach by the due date for that assignment. Your grade will be determined as follows:

Mastery	Date	Score
100%	On-time (Before Lecture)	100 XP
100%	<24 hours late	95 XP
100%	24 - 48 hours late	90 XP
100%	48 - 72 hours late	85 XP
100%	72 - 96 hours late	80 XP
100%	By Finals Week	50 XP

Otherwise, the % mastery reached at due date is the amount of XP awarded.

Lecture Participation

Lecture is going to be conducted in a "flipped mode" style. You are expected to have completed your Pre-Lecture Tutorials before the lecture begins. In Lecture, we will dive deeper into the application shown in ALTA and unravel the "how and why" these concepts are being utilized. Your lecture points will be assigned based on your familiarity with the material covered in the lecture measured via *lecture quizzes*.

Recitation Participation and Weekly Quiz

Recitation is where you will have a smaller classroom size and engage in interesting conceptual questions on the week's material. Why each question may looking daunting, you have the tools to handle each question and are encouraged to actively use your notes and discuss with your classmates!

If you are not actively working on math during the recitation, your GTA can, and will, give you 0 XP for the week.

At the end of recitation, you will be asked to write out a solution for a weekly quiz. Your accuracy in applied definitions and theorems, along with clarity will be measured. This is your opportunity to demonstrate your ability to write out clearly a solution. Your grading will be reflective of your notation and clearness of your argument.

Carefully Reading Your Syllabus

In general, most questions about the course are answered here! You should read this thing. As such, if you screenshot this section and email it to your GTA, you will gain 100 XP. Be warned though, the XP offer is only valid until the professor makes an announcement cancelling it!

Lab Study Hours

Lab study hours requirement will be met through time spent in the MALL. You are required to spend at least full two hours in the lab each week. The time spent there should be used to seek assistance for general clarification on topics, when doing homework, for group study or for additional tutoring.

The reason for MALL hours is to align with the pedagogical practice, ***work-and-walk-by orchestration***. [An orchestration is defined as the instructor's intentional and systematic organization and use of the various resources available in a learning environment — in this case the MALL and the associated course materials — to guide students.]

The Instructional Staff uses the orchestration to identify a mechanical skill or conceptual understanding problems when assisting students. Therefore, please do not see the MALL as a place to complete the time requirement and leave shortly thereafter. We encourage you to ask questions and make sure that you understand the mathematical content before you leave the MALL.

Showcases and Final Showcase

There will be four showcases and a final showcase. The final showcase will be in a comprehensive manner. All will be given in the lecture hall during the associated class time. A score of zero will be assigned in one of the following situations:

- the student misses the scheduled showcase;
- the student violates the UCF academic integrity policies during the exam or in any circumstance relative to the exam

Course Schedule

See the Assignments tab for when assignments are due. All due assignments are listed in webcourses at the start of the semester *except live in-person lecture assignments*.

W Course Schedule

Weeks / Dates	Lecture	Recitation	Other Notes
Week 1 **Jan 8 - 14**	T: Orientation to Course R: Preview of Calculus and the Introduction to Limits	Precalc Topic Review + Limit Practice	Check out the MALL!
Week 2 **Jan 15 - 21**	T: Epsilon-Delta Definition of Limit + Using Limit Laws R: Limit Evaluation Techniques + Squeeze Theorem + Trig Limits	Epsilon Delta Practice + Limit Law Concepts + Squeeze Theorem	
Week 3 **Jan 22 - 28**	T: Continuity at a point + continuity over an interval + IVT R: Tangent Lines + Derivative as a Function + Higher Order Derivatives	IVT + Continuity Concepts + Tangent Line Concepts	
Week 4 **Jan 29 - Feb 4**	T: Derivatives and Continuity + Basic Differentiation Rules R: Derivatives as Rates of Change + Motion along a line	Basic Differentiation Concepts + Continuity on a closed and bound interval	**Showcase of Limits: in MALL** Feb 1

Week 5 **Feb 5 - 11**	T: Product and Quotient Rule + Derivative of Powers R: Derivative of Trig Functions	Derivative Concept Questions	
Week 6 **Feb 12 - 18**	T: The Chain Rule + Inverse Derivative R: Implicit Differentiation	Tangent Lines and Implicit Differentiation + Concepts on Chain Rule	
Week 7 **Feb 19 - 25**	T: Exponential and Log Derivatives + Log Differentiation R: Related Rates	Log Diff and Related Rates Concepts	
Week 8 **Feb 26 - Mar 3**	T: Linear Approximation + Differentials R: Maxima and Minima	Newton's Method	**Showcase of Derivatives in MALL** Feb 29
Week 9 **Mar 4 - Mar 10**	T: Mean Value Theorem R: Derivatives and Shapes of Graphs	Locating max/mins + MVT Concepts	
Week 10 **Mar 11 - 17**	T: Limits at Infinity + Asymptotes + Sketching Functions R: Applied Optimization	Sketch a Function + Limits at infinity and square roots + Applied Optimization	
Week 11 **Mar 18 - 24**	SPRING	BREAK	TIME
Week 12 **Mar 25 - 31**	T: L'Hopital's Rule + Indeterminate Forms R: AntiDerivatives and Indefinite Integrals	Anti Derivatives + Hyperbolic Trig Functions	**Showcase of Applications in MALL** Mar 28
Week 13 **Apr 1 - 7**	T: Initial Value Problems + Approximating Areas R: Area and the Definite Integral	Riemann Sum Concepts + IVP + Area Identification	

Week 14 **Apr 8 - 14**	T: Properties of the Definite Integral + FTC R: Average Value + Net Change Theorem	Definite Integral and FTC Concepts	
Week 15 **Apr 15 - 21**	T: U-sub R: Integrals with exponents and Logs		**Showcase of Integration in MALL:** Apr 18
Week 16 **Apr 22 - 29**	T: Course Review Apr 23	No Recitation (Finals)	**Final Showcase in MALL** **April 25 and 26**

University Services and Resources

Academic Services and Resources

A list of available academic support and learning services (coaching, tutoring, etc.) is available at Student Success Resources. In particular, see the Academic Success and Study Spaces sections.

Non-Academic Services and Resources

A brief list of available student resources is available on the Student Success website. In particular, see the Student Wellness, Financial Resources, and Additional Resources sections.

If you are a UCF Online student, please consult the UCF Online Student Guidelines for more information about your access to non-academic services.

Policy Statements

Academic Integrity

Course Accessibility Statement

Campus Safety Statement

Deployed Active Duty Military Students

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