Calculus with Analytic Geometry I

MAC 2311C (4 credit hours)
Fall 2023

Instructor	Dr. Piotr Mikusinski
Course Modality	M
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Office Hours	The MALL: TBA
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Prerequisites PR: 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.

Required Materials *Calculus Volume 1* from Openstax and **Knewton Alta access code** (online homework system)

Recommended Reading A Mind For Numbers: How to Excel at Math and Science (Even If You Flunked Algebra), by Barbara Oakley

A Nobel Prize winner has a simple technique for learning anything quickly and effectively

Showcase dates All mid-term Showcases are given on Thursdays and are administered in the MALL: Sep 14, Oct 5, Oct 26, Nov 16. The Final Showcase will be given on Tuesday, December 5, and Thursday, December 7. All Showcases will have multiple time options.

Course Description Functions, limits, continuity, differentiation, applications of derivatives, indefinite and definite integrals, the fundamental theorem of calculus, applications of integrals.

Course Goals 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.

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.

Course format This course is offered in the M-flex modality. It includes both on campus activities and online instruction in a blended format.

Lectures There are three ways students can access the lectures: participation in person in the live class on Tuesdays and Thursdays from 10:30 to 11:50 am 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 quizzes.

Virtual group discussions You will be given a worksheet with problems that you will work on in groups. Your participation points will be assigned based on your active participation in the discussions and individually submitted solutions.

Weekly quizzes Weekly quizzes will be given out Monday on webcourses; they will be due Friday end of day. The weekly quizzes will be group based assignments. They will be graded on accuracy in conveying the steps demonstrating mastery of the concept.

Lab study hours Every student is required to spend three 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 three hours. This grade is binary (all-or-nothing).

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 on page 3 of the syllabus.

Showcases Showcases are your opportunity to deploy the tools of the course to solve problems. They will be hosted in the MALL.

Grading Policy

Activity	Calc XP earned per assignment	Total
Lectures	up to 50 for each lecture	1450
Pre-Lecture Tutorial	up to 100 for each Alta assignment	4500
Virtual group discussions	up to 100 for each assignment	1200
MALL Hours	100 for each full week in the MALL	1300
Weekly quizzes	up to 100 for each graded recitation quiz	1300
Showcase	up to 1500 for each showcase	6000
Final Showcase	up to 3000 for the final showcase	3000

Grading Scale

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 Grade

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** virtual group discussions 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

Please note that an NC grade cannot be requested. If a student has met all NC criteria, the student will automatically receive a grade of NC. Conversely, if a student does not meet the NC criteria, a grade of NC will not be given.

Make-up Policy

Assignment make-ups will typically not be given. Personal travel plans, medical reasons, and personal or family emergencies are usually not considered valid reasons for completing assignments at a time different than scheduled. Should you miss an assignment, you will receive a grade of zero.

Exception: Should you miss an assignment because of your compelled participation in official University-sponsored activities (ie not club activities), or court-imposed legal obligations, you may make up the assignment. You must however provide valid documentation before the assignment takes place.

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	100 XP
100%	less than 24 hrs late	95 XP
100%	between 24-48 hrs late	90 XP
100%	between 48-72 hrs late	85 XP
100%	between 72-96 hrs late	80 XP

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

Lab study hours

Lab study hours requirement will be met through time spent in the MALL. You are required to spend at least full three 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 the lab 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 computer lab 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. You can find the MALL schedule here.

The Instructional Staff in the MALL includes Graduate Teaching Assistants (GTAs or just TAs) and Undergraduate Learning Assistants (ULAs or just LAs).

TAs: Benjamin Titera, Parker Allmond, Isabela Vasconcellos Viana, William Fernando Rueda Prada, Austin Deal, Chukwugozirim Ehirim, Corey Prachniak, Kacie Kulenguski, Mike Desgrottes, Yao Shi, Piyali Chakraborty

LAs: Madison Adams, Ryan Barry, Allan Kozich III, Alsion Tafa, Christian Giovannetti, Colton Palmer, Elijah Rose, Hannah Moore, Isabella Polkey, Jeremy Cruz, Jonathan P Washuta, Leah Wendland Portalatin, Lucas Glorie, Rebeca Herr-Rivero, Samuel Levasseur Valero, Sidney Christensen, Lozier Mackey, Keith Richards, Kaitlyn Cierpik, Tatiana Gary, Jack Koller, Ethan A Robotham, Tristan Collao, Ashley James, Franschesca Paola Avendano Sandoval, Baylor Dalsemer, Ryan Markowitz, Jocelyn Brizuela

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.

Academic Honesty

The work submitted in this class is expected to be your own. Forms of cheating/academic dishonesty include (but are not limited to): communicating with another student during a test (this includes giving information to another student as well as receiving that information), and communicating contents of a test to another student either during or after a test to a student who has not yet taken the test.

UCF faculty members have a responsibility for your education and the value of a UCF degree, and so seek to prevent unethical behavior and when necessary respond to infringements of academic integrity. Instances of academic misconduct will be reported to the Office of Student Conduct. Penalties can include a failing grade on an assignment or in the course, suspension or expulsion from the university, and/or a "Z Designation" on a student's official transcript indicating academic dishonesty, where the final grade for this course will be preceded by the letter Z. For more information about the Z Designation, please see goldenrule.sdes.ucf.edu/zgrade/. For more information on academic honesty, please see the Golden Rule contents available at www.goldenrule.sdes.ucf.edu.

Please also note that there are many fraudulent websites claiming to offer study aids to students but are actually cheating sites. These sites encourage students to upload course materials such as test questions, individual assignments, and examples of graded material. Such materials are the intellectual property of instructors, the university, or publishers and may not be distributed without prior authorization. Students who engage in such activity are in violation of academic conduct standards and may face penalties.

Third parties may be selling class notes from this class without my authorization. Please be aware that such materials may contain errors, which could affect your performance or grade. Use these materials at your own risk.

Careful Reading

To encourage you to read the entire syllabus. Should you screenshot this section and email it to the professor, you will earn 100 XP. This offer will expire at a time of the professor's discretion.

Recording Academic Activity

All instructors/faculty are required to document students' academic activity at the beginning of each course. In order to document that you began this course, please complete the following academic activity by the end of the first week of classes or as soon as possible after adding the course. Failure to do so may result in a delay in the disbursement of your financial aid.

E-mail

All concerns should first be addressed to your Recitation Instructor. In the case that your issue was not resolved (or if it concerns the recitation section instructor herself), only then contact your lecture instructor. Please allow for two business days for a response to your email.
All communication between student and instructor and between students should be respectful and professional. Class rosters list student addresses rather than external email addresses, and all official class communications will be sent only to the student addresses. Students are responsible for acquiring, checking their student accounts regularly, and any class information sent to their student account. Please be sure to sign your name to your e-mails.

Course Accessibility Statement

The University of Central Florida is committed to providing access and inclusion for all persons with disabilities. This syllabus is available in alternate formats upon request. Students with disabilities who need specific access in this course, such as accommodations, should contact the professor as soon as possible to discuss various access options. Students should also connect with Student Accessibility Services (sas.sdes.ucf.edu), Ferrell Commons Room 185, phone (407) 823-2371, TTY/TDD only phone (407) 823-2116, sas@ucf.edu, before requesting accommodations from the professor.

Religious Policy

It is the practice of the University of Central Florida to reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. A student who desires to observe a religious holy day of his or her religious faith must notify his/her instructor in writing at the beginning of the term (**prior to 5:00 pm on Friday, Sep 01**) to be excused from classes to observe the religious holy day. Please note that documentation will be requested; and notice after the aforementioned date may result in no makeup assignment.

Deployed Active Duty Military Students

Students who are deployed active duty military and/or National Guard personnel and require accommodation should contact their professors as soon as possible after the semester begins and/or after they receive notification of deployment to make related arrangements.

Diversity and Inclusion

The University of Central Florida considers the diversity of its students, faculty, and staff to be a strength and critical to its educational mission. UCF expects every member of the university community to contribute to an inclusive and respectful culture for all in its classrooms, work environments, and at campus events. Dimensions of diversity can include sex, race, age, national origin, ethnicity, gender identity and expression, intellectual and physical ability, sexual orientation, income, faith and non-faith perspectives, socio-economic class, political ideology, education, primary language, family status, military experience, cognitive style, and communication style. The individual intersection of these experiences and characteristics must be valued in our community.

Title IX prohibits sex discrimination, including sexual misconduct, sexual violence, sexual harassment, and retaliation. If you or someone you know has been harassed or assaulted, you can find resources available to support the victim, including confidential resources and information concerning reporting options at letsbeclear.ucf.edu and cares.sdes.ucf.edu.
If there are aspects of the design, instruction, and/or experiences within this course that result in barriers to your inclusion or accurate assessment of achievement, please notify the instructor as soon as possible and/or contact Student Accessibility Services.

For more information on diversity and inclusion, Title IX, accessibility, or UCF's complaint processes contact:

- Title IX–OIE – oie.ucf.edu and askanadvocate@ucf.edu
- Disability Accommodation/Student Accessibility Services – sas.sdes.ucf.edu and sas@ucf.edu
- Diversity and Inclusion Training and Events – diversity.ucf.edu
- Student Bias Grievances/Just Knights response team – jkrt.sdes.ucf.edu
- UCF Compliance and Ethics Office – compliance.ucf.edu and complianceandethics@ucf.edu
- Ombuds Office – ombuds.ucf.edu

Important Fall 2023 Academic Dates and Deadlines

Classes begin	Monday, August 21
Late registration	Monday, August 21 - Friday, August 26
Add/drop/swap deadline	Friday, August 26
Labor Day	Monday, September 4
Withdrawal deadline	Friday, October 27, 11:59 pm
Veteran's Day (Obs)	Friday, November 10
Thanksgiving Break	Wednesday, November 23 - Friday, November 25
Classes end (last day to remove incomplete)	Saturday, December 2
Final Showcase	Tuesday, December 5, and Thursday, December 7, with multiple time options.

	Dates	Tuesday	Thursday	Friday
Week 1	Aug 21 - Aug 25	Course information	Preview of Calculus + The intuitive definition of a limit	Practicing Limits
Week 2	Aug 28 - Sep 01	One-Sided Limits + Infinite Limits + Evaluating Limits with the Limit Laws + Additional Limit Evaluation Techniques	The Squeeze Theorem and Limits of Trigonometric Functions + Limits and continuity + Continuity at a Point	Squeeze Theorem + Trig Limit
Week 3	Sep 04 - Sep 08	Continuity over an Interval + Intermediate Value Theorem + Tangent Lines + The Derivative of a Function at a Point	Derivatives and Continuity + Derivative Functions and their Graphs + Higher-Order Derivatives	IVT + Tangent Lines
Week 4	Sep 11 - Sep 15	Differentiation Rules + Derivatives as Rates of Change	**Showcase of Limits**	Diff Rules + Rates of Change
Week 5	Sep 18 - Sep 22	Product and Quotient Rule + Derivatives of Powers	Derivative of Trigonometric Functions	Apply New Rules to Old Limits
Week 6	Sep 25 - Sep 29	The Chain Rule + Derivatives of inverse functions	Implicit Differentiation	Impl. Diff and Tangents
Week 7	Oct 02 - Oct 06	Derivatives of exponential and logarithmic functions + Logarithmic differentiation	**Showcase of Derivatives**	Log Diff
Week 8	Oct 09 - Oct 13	Related rates	Linear approximation and differentials + Differentials and calculating error	Related Rates and Apps
Week 9	Oct 16 - Oct 20	Maxima and minima + The mean value theorem	Derivatives and the shape of a graph	Max/Min problems
Week 10	Oct 23 - Oct 27	limits at infinity + graph sketching + Applied optimization problems	**Showcase of Applications**	Graph Sketching + App Op
Week 11	Oct 30 - Nov 03	L'Hospital's rule + Indeterminate forms	Antiderivatives and indefinite integrals + Initial-Value Problems and Motion	L'H + integrals
Week 12	Nov 06 - Nov 10	Approximating areas	the definite integral + Area and the definite integral	**Veteran's Day**
Week 13	Nov 13 - Nov 17	Properties of the Definite Integrals + The fundamental theorem of calculus	**Showcase of Integration**	H. Trig. + Newt M.
Week 14	Nov 20 - Nov 24	The average value of a function + The net change theorem	**Thanksgiving**	**Thanksgiving**
Week 15	Nov 27 - Dec 01	U-Sub for indefinite integrals	U-Sub for definite integrals + Integrals involving exponential and logarithmic functions	**Final Showcase**

Note: Information in this syllabus is subject to change. Any changes will be clearly announced in webcourses.