Calculus with Analytic Geometry I

MAC 2311C

4 Credit Hours

Fall 2022

Instructor: Dr. Piotr Mikusinski (Mee-koo-sheen-ski)
Course Modality: M-Flex
E-mail: piotr.mikusinski@ucf.edu
Office Hours: Tuesdays and Thursdays, 10:30 – 11:20 am in CB2 106 or by appointment
Math Dept Office/Phone: MSB 0207/407.823.6284
Teaching Assistants:

Section	TA	Time	Classroom
101	Jingxi Liao	07:30 AM - 08:50 AM	MSB 0406
102	Jay Nulph	07:30 AM - 08:50 AM	HEC 0111
103	Chisom Prince Okeke	07:30 AM - 08:50 AM	MSB 0405
104	Timothy O'Brian	07:30 AM - 08:50 AM	MSB 0407
105	Jingxi Liao	09:00 AM - 10:20 AM	MSB 0406
106	Michael Scully	09:00 AM - 10:20 AM	HEC 0111
107	Isabela Viana	09:00 AM - 10:20 AM	MSB 0405
108	Timothy O'Brian	09:00 AM - 10:20 AM	MSB 0407
109	Yao Shi	10:30 AM - 11:50 AM	MSB 0406
110	Isabela Viana	10:30 AM - 11:50 AM	HEC 0111
111	Matthew Kyle	10:30 AM - 11:50 AM	MSB 0405
112	Gray Carson	10:30 AM - 11:50 AM	MSB 0407
113	Jingxi Liao	12:00 PM - 01:20 PM	MSB 0406
114	Michael Scully	12:00 PM - 01:20 PM	HEC 0111
115	Chisom Prince Okeke	12:00 PM - 01:20 PM	MSB 0405
116	Jay Nulph	12:00 PM - 01:20 PM	MSB 0407
117	Yao Shi	01:30 PM - 02:50 PM	MSB 0406
118	Gray Carson	01:30 PM - 02:50 PM	HEC 0111
119	Matthew Kyle	01:30 PM - 02:50 PM	MSB 0405
120	Chisom Prince Okeke	01:30 PM - 02:50 PM	MSB 0407
121	Yao Shi	03:00 PM - 04:20 PM	MSB 0406
122	Gray Carson	03:00 PM - 04:20 PM	HEC 0111
123	Matthew Kyle	03:00 PM - 04:20 PM	MSB 0405
124	Isabela Viana	03:00 PM - 04:20 PM	MSB 0407
125	Elijah Cadenhead	09:00 AM - 10:20 AM	MSB 0109
126	Jay Nulph	09:00 AM - 10:20 AM	ENG1 O224
127	Elijah Cadenhead	10:30 AM - 11:50 AM	MSB 0109
128	Benjamin Keene	10:30 AM - 11:50 AM	ENG1 O227
129	Benjamin Keene	12:00 PM - 01:20 PM	MSB 0109
130	Athanasios Dimitriades	12:00 PM - 01:20 PM	MSB 0121
131	Elijah Cadenhead	01:30 PM - 02:50 PM	MSB 0109
132	Athanasios Dimitriades	01:30 PM - 02:50 PM	MSB 0121

Learning Assistants: Madison Adams (Lead LA), Anisa Khalid, Tatianna Gary, Anthony Saba, Franklin Rivera-Leon, Michael Bassett, Isabella Polkey, Francisco Canova, Lauren Caccamise, Haryson Pierre Louis, Etham Robotham, Jonathan Washuta, Tien Pham, Hannah Moore, Jonathan Glitzendanner, Ryan Barry, Kenneth Thuleweit, Benjamin Howard

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.

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

Coures Goals This course will introduce students to limits, derivatives, and integrals for functions of a single variable. The course will prepare students for MAC2312.

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, 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.

Required Textbook and Other 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

Test dates All mid-term exams will be given on Thursdays:

Test 1: September 15 **Test 2:** October 13 **Test 3:** November 10 **Test 4:** December 1

Final Exam: Tuesday, December 6, and Thursday, December 8, multiple time options

Course format This course is offered in the M-flex modality.

Live classes There are three ways students can access the lectures: participation in person in the live class on Mondays and Wednesday from 12:00 to 1:20 pm in CB2 201, watching the live class online in real time, and watching the recording posted in webcourses. During all class meetings students will be asked to take quizzes that check their understanding of the discussed material and address common misconceptions. Quizzes will be available in webcourses until 11:59 pm of the day they were given in class. Your class participation points will be assigned based on your timely completion of the quizzes.

Recitations Mandatory recitations will meet on Fridays at the posted times 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 and your individual solutions presented to your Teaching Assistant at the end of the recitation.

Lab study hours Every student is required to spend two hours every week in the MALL engaged in course related activities. Your lab hours points for each week will be assigned based on your participation in lab activities for at least two hours. Information about the location and the time the lab is available can be found at https://sciences.ucf.edu/math/mall/computer-availability-maps/.

Online homework Knewton Alta adaptive online homework 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 4 of the syllabus.

Grading Policy

Knewton Alta assignments	21%
Class quizzes	3%
Recitation participation	10%
Lab study hours	6%
Mid-term test average	36%
Final Exam	24%

There are four mid-term exams. The average of the best three scores will be used to calculate your course grade. This policy includes a grade of zero due to a missed exam.

Grading Scale

Final Percentage	Letter Grade
90-100	A
86-89	B+
80-85	B
76-79	C+
70-75	C
Below 70 and NC criteria met	NC
Below 70 and NC criteria not met	F

NC Grade

The intent of the 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 "No-credit" (NC) grade will be given in place of an F when the following criteria are met:

- Student misses no more than two Recitation Sessions after the add deadline
- Student earns 0% on no more than three Alta homework assignments after the add deadline
- Student earns 0% on no test or exam (this includes Test 1-4 and the Final Exam)

Please note that an "NC" grade cannot be requested. If a student has met the 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. A dropped homework score(s), is independent of the "NC" policy.

Make-up Policy

Exam make-ups will typically not be given. Personal travel plans, medical reasons, and personal or family emergencies are usually not considered a valid reasons for taking tests at a time different than scheduled. Should you miss an exam, you will receive a grade of zero, which will automatically count as your lowest exam grade.

Exception: Should you miss an exam because of your participation in official University-sponsored activities, or court-imposed legal obligations, you may make up the exam. You must however provide valid documentation before the exam 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 or don't know and 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.)
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 could be increased to 95% if you progress to 100% mastery within the first 24 hours after the due date. After that your grade could be increased to 90% if you progress to 100% mastery during the 24-48 hours after the due date. If your master level remains below 100% or if you progress to 100% mastery more than 48 hours after the due date, your grade will remain the same as it was on the due date.

Lab study hours

Lab study hours requirement will be met through time spent in the designated labs 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.

Tests

There will be three mid-term exams and a comprehensive final exam. All test will be given in the designated labs in the MALL. A grade of zero on a test will be assigned in one of the following situations:

- the student misses the scheduled exam;
- 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.

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 Session 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.
All communication between student and instructor and between students should be respectful and professional. Class rosters list Knights addresses rather than external email addresses, and all official class communications will be sent only to the Knights addresses. Students are responsible for acquiring, checking their Knights accounts regularly, and any class information sent to their Knights 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, September 2**) to be excused from classes to observe the religious holy day. Please note that documentation will be requested.

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 shield.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 2022 Academic Dates and Deadlines

Classes begin	Monday, August 22
Late registration	Monday, August 22 - Friday, August 26
Add/drop/swap deadline	Friday, August 26
Labor Day	Monday, September 5
Withdrawal deadline	Friday, October 28, 11:59 pm
Veterans Day	Friday, November 11
Thanksgiving break	Wednesday, November 23 - Saturday, November 26
Classes end (last day to remove incomplete)	Friday, December 2
Final exam	Tuesday, December 6, and Thursday, December 8

	Dates	Monday	Wednesday	Thursday
Week 1	Aug 22 - Aug 26	Course information	A Preview of Calculus + The Intuitive Definition of a Limit	
Week 2	Aug 29 - Sep 2	One-Sided Limits + Infinite Limits + Evaluating Limits with the Limit Laws	Additional Limit Evaluation Techniques + The Squeeze Theorem and Limits of Trigonometric Functions	
Week 3	Sep 5 - Sep 9	**Labor Day**	Limits and continuity + Continuity at a Point + Continuity over an Interval + Intermediate Value Theorem	
Week 4	Sep 12 - Sep 16	Tangent Lines + The Derivative of a Function at a Point + Derivatives and Continuity	Derivative Functions and their Graphs + Higher-Order Derivatives	**Exam 1**
Week 5	Sep 19 - Sep 23	Differentiation Rules	Derivatives of Powers and Trigonometric Functions	
Week 6	Sep 26 - Sep 30	The Chain Rule + Derivatives of inverse functions	Implicit differentiation	
Week 7	Oct 3 - Oct 7	Derivatives of exponential and logarithmic functions +Logarithmic differentiation	Derivatives as rates of change	
Week 8	Oct 10 - Oct 14	Related rates + Linear approximation and differentials	Differentials and calculating error	**Exam 2**
Week 9	Oct 17 - Oct 21	Maxima and minima + The mean value theorem	Derivatives and the shape of a graph	
Week 10	Oct 24 - Oct 29	Limits at infinity + Asymptotes and sketching the graph of a function	Applied optimization problems	
Week 11	Oct 31 - Nov 4	L'Hospital's rule + Indeterminate forms	Antiderivatives and indefinite integrals + Initial-Value Problems and Motion	
Week 12	Nov 7 - Nov 11	Approximating areas and the definite integral	Area and the definite integral + Properties of the Definite Integral	**Exam 3**
Week 13	Nov 14 - Nov 18	The fundamental theorem of calculus	The average value of a function + The net change theorem	
Week 14	Nov 21 - Nov 25	Substitution for indefinite and definite integrals	**Thanksgiving**	
Week 15	Nov 28 - Dec 1	Integrals involving exponential and logarithmic functions	Course review	**Exam 4**

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