Math131 Online Course Syllabus

Course Title

Calculus I

Course Number

Math131-02 & 03

Instructor, Office, Email

Instructor: Jinguo Lian

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Class Schedule and Location

Section 02 (5/21/2024-7/3/2024), Section 03 (7/8/2024-8/16/2024)

we use asynchronous online teaching, there are no regular classes scheduled.

Location: UMass Canvas online course

Office hours

There are no specified office hours. Questions can be answered through WebAssign communication, zoom office hours and emails.

Prerequisites

High school algebra I and II, Trigonometry, Plane geometry and Pre-calculus (Analytic geometry).

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High school algebra I and II, Trigonometry, Plane geometry and Pre-calculus (Analytic geometry).

Required materials

Textbook: James Stewart, Calculus: Early Transcendentals, 9th Edition, Cengage Learning, 2021.

1) Register WebAssign and eBook through the Canvas course. You want to register and access WebAssign and eBook through your Canvas account. Please use your UMass email when registering into WebAssign. Students get a 6-day free trial of WebAssign and EBook that starts the first day of the course. You can purchase access directly from your WebAssign account after you register into WebAssign. $88.92 for single-term access or $124.96 for the multi-term access (**Recommended**).

If you need to buy a paper textbook separately,

(2) Purchasing Textbook: The eBook is within WebAssign but you can purchase a printed textbook through the link below if you choose: https://www.cengage.com/c/calculus-early-transcendentals-9e-stewart-clegg-watson/9781337613927/

NOTE: Instead of purchasing your course materials through eCampus, you can purchase access to WebAssign when you register for your Cengage/WebAssign account. This can be done during the first week of classes, and it will be at a discounted price. There are two options: single-term access and multi-term access. If you only need to take Math 131, then you can purchase single-term access for $88.92. If you need to take Math 132 and/or Math 233 after Math 131, then you can purchase the multi-term option for $124.96.

If you decide to order your course materials through eCampus, choose (1) if you only need to take Math 131. Choose (2) if you need to take Math 132 and/or Math 233 after Math 131. Do not purchase both (1) and (2).

(1) Stewart - WebAssign for Stewart's Calculus: Early Transcendentals 9e , Single-Term Printed Access Card –ISBN: 9780357128923

(2) Stewart/Clegg/Watson - WebAssign for Stewart/Clegg/Watson's Calculus: Early Transcendentals 9e, Multi-Term Printed Access Card – ISBN: 9780357128947

There is lots of helpful information including a demo student registration video into WebAssign through Canvas as well as Office Hours for students needing help with registering into WebAssign through Canvas: https://www.cengage.com/coursepages/UMass_MATH131summer

Calculator

A graphing calculator may be useful for the Webassign online homework. There is no calculator allowed in any exams. If you never have one, then we recommend you to buy TI-89, you may see the online tutoring about TI-89 at http://www.prenhall.com/esm/app/graphing/ti89/. If you already have a TI series calculator, like TI-83, 84, this should be adequate for the course.

Teaching Assistants

TBA

Course Description

Math131 is the first in a three-course Calculus sequence Math131–132–233 which covers basic concepts, methods, and applications suitable for majors in engineering, natural sciences, computer science, mathematics, etc. The emphasis is on problem solving instead of on proving theorems. Math 131 mainly studies derivatives of single-variable functions, covering these topics: limits, continuity, derivatives, implicit differentiation, related rates, maxima and minima, and an introduction to definite integrals with applications to area.

Learning Objectives

(1) Become a competent user of differential calculus

(2) Develop problem-solving skills, especially in formulating verbal descriptions as mathematical problems and in constructing long, multi-step solutions.

(3) Develop ability to write well-organized, coherent solutions to problems.

(4) Understand the concept of derivative as representing rate of change and slope.

(5) Know basic differentiation formulas and rules and be adept at computing derivatives of elementary functions symbolically.

(6) Understand the concept of definite integral, especially as representing area and distance, and to be able to approximate a definite integral by Riemann sums.

Course Requirements

As a four-credit course running over 6-weeks you should plan to spend between 15-20 hours a week to learn, study, and interact in our online classroom. This course runs over the holiday break so you can take some days off from your studies, but you should log into our course site every two to three days to review announcements, participate in ongoing discussions, check for grades, and feedback, and ensure you are engaging with the course material, your classmates, and with me.

Students should make a study plan regularly to watch the lecture videos and complete homework in scheduled study units.

Students should actively post questions on WebAssign communication.

Complete assigned exam practice questions on Canvas course.

Attend and complete the midterm and the final exam in scheduled period.

Topics

Introduction – What is calculus?

Chapter 2 – Limits and derivatives

2.1 The tangent and velocity problems
2.2 The limit of a function
2.3 Calculating limits using the limit laws
2.4 The precise definition of a limit
2.5 Continuity
2.6 Limits at infinity; horizontal asymptotes
2.7 Derivatives and rates of change
2.8 The derivative as a function

Chapter 3 – Differentiation Rules

3.1 Derivatives of polynomials and exponential functions
3.2 The Product and Quotient Rules
3.3 Derivatives of trigonometric functions
3.4 The Chain Rule
3.5 Implicit differentiation
3.6 Derivatives of logarithmic functions
3.7 Rates of change in the natural and social sciences
3.8 Exponential growth and decay
3.9 Related rates **
3.10 Linear approximations and differentials

Chapter 4 – Applications of Differentiation

4.1 Maximum and minimum values
4.2 The Mean Value Theorem
4.3 How derivatives affect the shape of a graph
4.4 Indeterminate forms and L'Hospital's Rule
4.7 Optimization problems
4.8 Newton's Method **
4.9 Antiderivatives

Chapter 5 – Integrals (introduction)

5.1 Areas and distances
5.2 The definite integral and Riemann sums

Course Schedule

The following is meant to give a general idea of which sections are covered in which unit.

2024 summer term 1 (5/21/2024-7/3/2024) course schedule			
Time	***Lecture***	***Events***	Memo
5/21-23	Intro, 2.1-2.3	First lecture is on Tuesday, 5/21	
5/24, 5/27-5/28	2.4-2.5	5/27 Monday is a Holiday; 5/28 last day to add/drop	
5/29-31	2.6-2.8		
6/3-4	3.1-3.3		
6/5-7	Review; Midterm	Midterm covers 2.1-3.3; Midterm is on Friday 6/7, 7-9pm EST	
6/10-11	3.4-3.6		
6/12-14	3.7-3.9	6/14, Tuesday is Last day to drop with "W"	
6/ 17-18	3.10, 4.1-4.2		
6/19-20	4.3	6/19 is a Holiday	
6/21	4.4		
6/24-25	4.7,4.9		
6/26-28	5.1-5.2		
7/1-2	Review		
7/3	Final exam	Final Exam covers 2.1-5.2; Final Exam is on Wednesday 7/3, 7-9pm EST	
7/8		Final grade is due by midnight Thursday, 7/8	Your grade will be posted on SPIRE.

2024 summer term 2 (7/8/2024-8/16/2024) course schedule			
Time	***Lecture***	***Events***	Memo
7/8-10	Intro, 2.1-2.3	First lecture is on Monday, 7/8	
7/11-12	2.4-2.5	7/12 Friday is the last day to add/drop	
7/15-17	2.6-2.8		
7/18-19	3.1-3.3		
7/22-23	Review; Midterm	Midterm covers 2.1-3.3; Midterm is on Tuesday 7/23, 7-9pm EST	
7/24-26	3.4-3.6		
7/29-31	3.7-3.9	7/31 Wednesday is Last day to drop with "W"	
8/1-2	3.10, 4.1-4.2		
8/5-6	4.3		
8/7	4.4		
8/8-9	4.7, 4.9		
8/12-13	5.1-5.2		
8/14-15	Review		
8/16	Final exam	Final Exam covers 2.1-5.2; Final Exam is on Friday 8/16, 7-9pm EST	
8/21		Final grade is due by midnight Wednesday, 8/21	Your grade will be posted on SPIRE.

Course information and communication

Log on to the Canvas course where you may find printable syllabus, PDF notes, lecture videos and homework. If you have any questions, you may post questions on Webassign communication, drop in TA's zoom office hours or send me an email.

Weights of Individual Assignments toward final grade

Homework: All students require the WebAssign online homework system, which you may self-enroll in the online homework system through the Canvas course. Please watch the instruction video at https://startstrong.cengage.com/webassign-canvas-ia-no/, and then register WebAssign through your Canvas account to do homework or study eBook there. You can do homework with others, but you must enter answers yourself. There is no make-up for homework unless there is some certified special accommodation from disability service center or if there is a medical reason, then you

must provide a medical professional's statement. Homework will be 50% of final grading.

Practice Exams: Before Midterm/Final Exam, I will post two Practice exams; you must print practice exams out, treat them as the real exams, complete them, scan the solution using your iPhone to a pdf file, and submit the solution to gradescope before the due date. Practice Exams are 10% of the final grading. Practice Exams will be graded roughly, we mainly check if students tried and justified the solution for each question.

Midterms: we will hold a 2-hour midterm with 6 handwritten questions. Midterm will be 20% of final grading.

Final Exam: we will hold a 2-hour final exam with 6 handwritten questions. The final exam will be 20% of final grading.

Bonus: For students to practice HonorLock+Canvas+Gradescope exams, I have created a HonorLock Practice exam, this is a roughly grade quiz. If you follow the HonorLock+Canvas+Gradescope exam instructions (complete version) posted on canvas course to access the practice exam and submit the solution to Gradescope in the pointed time frame. You will earn 5% bonus points.

Grading Scale

For your total scores: each of Midterm and Final Exam is 20%, online homework is 50%, Practice Exam 10% and Bonus 5% (if you earned). To receive a passing grade in the course, the average of all midterm and final exam scores must be at least a 50%.

The course letter-grade scale without round:

A	A−	B+	B	B−	C+	C	C−	D+	D	F
90	87	83	79	75	71	67	63	59	55	<55

For example, since 90-100 is A and 87-90 is A- this means 89.999 still an A- and not rounded up to a 90.000 which is an A.

Exam Instruction

Exam Policy: Midterm and Final Exam are closed book; there is no calculator allowed in any exams; Exam dates and materials covered are listed in the weekly schedule. All exams are written exams. Be sure to bring your UMass student ID card (if UMass ID

is not available, you may use a government photo ID, like driver's license, passport) and any other exam allowed supplies (like pens, pencils, and erasers) when you attend the Exam. All students must take the regular exam unless you are qualified to take an official make-up exam that has been permitted by your instructor, which follows the procedure of make-up request. **As long as an exam has been taken, it can NOT be retaken**.

Exam Proctoring: The Mathematics and Statistics department, in accordance with the University of Massachusetts at Amherst, continues to promote the integrity and security of its courses. To further secure its courses, the department will require one proctored midterm and a proctored final exam in this course. Students who enroll in this online course will have to take the midterm and the final exam within the scheduled exam time frame. Off-campus proctoring will require either a webcam or travel to an accredited testing center. All proctoring arrangements must be in place and approved by the instructor and math department no later than the last day of add/drop for the course.

Honorlock Proctoring System: Honorlock will proctor the exams this winter session. Honorlock is an online proctoring service that allows you to take the exam at home. You DO NOT need to create an account, download software, or schedule an appointment in advance. Honorlock is available 24/7 and all that is needed is a computer, a working webcam, and a stable Internet connection.

To get started, you will need Google Chrome and the Honorlock Chrome Extension. You can download the extension at www.honorlock.com/extension/install

When you are ready for the test, log onto canvas course, go to your course, and click on your exam. Clicking "Launch Proctoring" will begin the Honorlock authentication process, where you will take a picture of yourself, show your ID, and complete a scan of your room. Honorlock will be recording your exam session by webcam, as well as recording your screen. Honorlock also has an integrity algorithm that can detect search-engine use, so please do not attempt to search for answers even if it's on a secondary device.

Your exam will be proctored by Honorlock. You will need the following items to setup and then subsequently to take the exam:

1. Google Chrome browser installed https://www.google.com/chrome
2. A webcam on your computer
3. A photo ID (preferably your student ID).
4. A strong enough internet connection to support the webcam.

A brief, ungraded quiz to familiarize yourself with the proctoring environment and ensure your computer is configured properly to take the test. The practice exam is strongly encouraged to help test your internet connection, configure your computer properly and to use as a trial run for your test.

Google Chrome and Gradescope: I will enroll you in your Gradescope course after the add/drop period. You can submit the practice exams, midterm and final exam to gradescope.

Before you enter the exam make sure that you:

1. Install Google Chrome.
2. Install the HonorLock extension for Google Chrome.
3. Have immediate access to a scanner or scanning app to document and upload your solution PDF to Gradescope.
4. Have blank white paper to complete your work on. Roughly 10 sheets should be sufficient.
5. Have a photo ID with your name clearly visible (preferably your student ID). If your student ID is not available, a government photo ID, like driver's license or passport would be fine.
6. There are no calculators or notes allowed on any exams. Be sure that these are not present in the test setting.

Note: You need to make sure that you are using Google Chrome and have the Chrome extension for HonorLock, otherwise, you cannot access the exam.

There is no re-taking of exams in this course. If an emergency arises, and you are unable to take an exam, contact your instructor within 24 hours of the exam to schedule a make-up exam. **Once an exam has been taken, it cannot be re-taken or made-up.**

When it comes time for submission, you will be using a cell phone to take pictures of your actual completed exam pages. Please consider a PDF conversion app like Tiny Scanner for Apple mobile devices or CamScanner for Android devices. These apps will take photos from your phone and merge them into a singular PDF file that you will then email (you should have a gmail account in both your cellphone and the computer) to yourself (much like a traditional PDF scanner will do), then you can download the PDF file to your computer and upload it into the exam submission.

Here's a link from Gradescope with some instructions about scanning work using your phones that might be helpful Scanning Work on a Mobile Device - Gradescope Help Center.

How to scan and submit your work in Gradescope submitting_hw_guide.pdf.

Honorlock Support: You can reach support at Honorlock support, or you through the LiveChat icon available directly on the bottom right of the "Review Your Exam Guidelines" page prior to launching proctoring.

If you have any issues during the exam or Hornorlock is not working, please reach out directly to Honorlock support team. One of Honorlock support agents will be able to assist you.

Make-up request: All the students should check your travel plan and exam schedules of your courses carefully. If you have any schedule conflicts, you should hand in a written request with your name, student ID, section number, brief reason, and an official support document to your instructor at least two weeks before the exam. Then your instructor will arrange all make-up requests, any late make-up requests will be refused. I will notify you when and where to take the make-up exam in a few days before the exam.

Which case and where is the official support document for the make-up request?

(1) If you have an exam (or a class) schedule conflicts with the regular exam, you should log on the Spire page, go to "Student Home" and then to "Evening Exam Conflict". This will allow you to fill out a conflict form and submit it. Then the registrar will email your instructor who needs to provide a makeup exam.

(2) If you have a university travel for university business during the regular exam date, like an athletic competition or academic conference etc., you should ask your supervisor or your coach to write an explanation letter including his/her phone number to your instructor as the official written document. Your instructor may verify the event by phone call.

(3) If you have a religious observance on regular exam date and can NOT take the exam, you should write an explanation letter yourself and attach the invitation letter or relevant information as the official document.

(4) If you have a medical reason and cannot take the regular exam, you should ask a medical professional's statement including his/her phone number which indicates that you were unable for medical reason to take the scheduled exam. If the medical professional's statement is not given before the exam, your instructor may refuse your make-up request.

Unless there are listed above documented reasons for absence, make-up assignments and exams won't be offered.

Accommodation Statement

The University of Massachusetts Amherst is committed to making reasonable, effective, and appropriate accommodations to meet the needs of students with disabilities and help create a barrier-free campus. If you have a disability and require accommodation, please register with Disability Services (161 Whitmore Administration building; phone 413-545-0892), meet with an Access Coordinator and send an accommodation letter to your faculty. Information on services and materials for registering are also available on the website www.umass.edu/disability.

Contingency plan

Before the semester, please test the technology that we use. If you have a difficulty to access the Canvas course, please contact UMass OIT support https://www.umass.edu/it/support.

Gradescope: you will need a gradescope account with www.gradescope.com for submission of written Exams/practice exams. I will notify you about how to log on to your gradescope account after the add/drop period.

Help

The best way to get help is to post your questions on WebAssign communication, drop in TA's zoom office hours (TA's zoom office hour schedule will be posted on Canvas course in "TA's schedule") or send me an email at jinguo@umass.edu.

Incompletes

An Incomplete is possible only if: (1) you had a compelling personal reason, e.g., serious illness; (2) your work has clearly been passing; and (3) there is a good chance you'll complete the course with a passing grade within the allotted time. Thus, **failing work is no reason for an Incomplete.**

Academic Honesty Statement

Since the integrity of the academic enterprise of any institution of higher education requires honesty in scholarship and research, academic honesty is required of all students at the University of Massachusetts Amherst. Academic dishonesty is prohibited in all programs of the University. Academic dishonesty includes but is not limited to cheating, fabrication, plagiarism, and facilitating dishonesty. Appropriate sanctions may be imposed on any student who has committed an act of academic dishonesty. Instructors should take reasonable steps to address academic misconduct. Any person who has reason to believe that a student has committed academic dishonesty should bring such information to the attention of the appropriate course instructor as soon as possible. Instances of academic dishonesty not related to a specific course should be brought to the attention of the appropriate department Head or Chair. Since students are expected to be familiar with this policy and the commonly accepted standards of academic integrity, ignorance of such standards is not normally sufficient evidence of lack of intent (http://www.umass.edu/dean_students/codeofconduct/acadhonesty/).

Title IX Statement

In accordance with Title IX of the Education Amendments of 1972 that prohibits gender-based discrimination in educational settings that receive federal funds, the University of Massachusetts Amherst is committed to providing a safe learning environment for all students, free from all forms of discrimination, including sexual assault, sexual harassment, domestic violence, dating violence, stalking, and retaliation. This includes interactions in person or online through digital platforms and social media. Title IX also protects against discrimination on the basis of pregnancy, childbirth, false pregnancy, miscarriage, abortion, or related conditions, including recovery. There are resources here on campus to support you. A summary of the available Title IX resources (confidential and non-confidential) can be found at the following link: https://www.umass.edu/titleix/resources. You do not need to make a formal report to access them. If you need immediate support, you are not alone. Free and confidential support is available 24 hours a day / 7 days a week / 365 days a year at the SASA Hotline 413-545-0800.

General Education Designation

MATH 131 is a four-credit General Education course that satisfies the R1 (Basic Math Skills) and R2 (Analytic Reasoning) general education requirements for graduation.

The General Education Program at the University of Massachusetts Amherst offers students a unique opportunity to develop critical thinking, communication, and

learning skills that will benefit them for a lifetime. For more information about the General Education Program, please visit the GenEd web page.

Learning Outcomes for all General Education courses

Math 131 satisfies the following General Education objectives:

Content: Know fundamental questions, ideas, and methods of inquiry/analysis used in mathematics: Students will learn limits and continuity of functions, use these to compute rates of change, and analyze their real-life and theoretical applications.

Critical Thinking: Students demonstrate creative, analytical, quantitative, & critical thinking through inquiry, problem solving, & synthesis: Students will use critical thinking skills to develop and understand rates of change of functions using limits, and computational skills to find these rates of change efficiently. Students will demonstrate an understanding of various methods of differentiation in order to compute the rate of change for many types of functions.

Communication: Develop informational and technological literacy: Students will develop their writing skills by articulating their reasoning for computations throughout the course.

Demonstrate capacity to apply disciplinary perspectives and methods of analysis to real world problems (the larger society) or other contexts: Students will apply the theoretical concepts of calculus to real-world and theoretical problems. Students will use the derivative to find where a function reaches is maximum and minimum values, and apply this to various contexts such as finding the maximum height of an object travelling through the air.

Learning Outcomes for the R1 and R2 Designations

Because Math 131 presupposes basic math skills, it carries the designation for the Basic Math Skills requirement (R1). In addition, the course satisfies the following objectives of the Analytic Reasoning requirement (R2):

Advance a student's formal or mathematical reasoning skills beyond the level of basic competence: In learning Calculus in Math 131, students will think critically about the overarching idea of rates of change. Students will advance their mathematical literacy and analyzing skills by learning to limits of mathematical functions and using these limits to construct accurate and efficient ways of computing rates of change, called derivatives.

Increase the student's sophistication as a consumer of numerical information: Students will connect the ideas of rates of change to various disciplines by analyzing and solving problems in both real life and theoretical applications.

Indicate the limits of formal, numerical, quantitative, or analytical reasoning and discuss the potential for the abuse of numerical arguments: Students will learn methods of both estimating and computing cumulative change. Students will analyze when it is appropriate to use an estimation, as well as the accuracy and efficiency of their estimations.