UNIVERSITY OF MASSACHUSETTS AMHERST
DEPARTMENT OF MATHEMATICS AND STATISTICS

MATH 132 Calculus II (4 credits, Gen. Ed. R2)

Course Syllabus - [redacted]

Course Chair: [redacted]
Office: [redacted]
Email: [redacted]
Office Hours: TBA

Course Pre-requisite: MATH 131 or equivalent.

Course Textbook: *Calculus: Early Transcendentals*, 9th Edition, James Stewart. Enhanced WebAssign (Webassign access code + *e*-book) is required for this course. Your homework will be done through Enhanced WebAssign based on the textbook. The *e*-book and WebAssign access code together are built within your Canvas course. A hard copy of the textbook is not required.

Course Description: The definite integral, techniques of integration, and applications to physics, chemistry, and engineering. Sequences, series, and power series. Taylor and MacLaurin series.

Course Objectives: To introduce the concept of integration, study various techniques of integration and illustrate some applications of integration. To define sequences and infinite series and, and determine convergence and divergence. To find the Taylor and Maclaurin series to represent some functions.

Grade Weight and Course Requirements: There will be two midterms and a final exam.

- **Midterm Exam 1**: [redacted] room TBA.
  Make-up Exam 1: [redacted] room TBA.
  Exam 1 covers 5.3-5.5, 6.1 & 6.2, 7.1-7.5, and it will count as **25**% of the final grade.
- **Midterm Exam 2**: [redacted] room TBA.
  Make-up Exam 2: [redacted] room TBA.
  Exam 2 covers 7.8, 11.1-11.7, and it will count as **25**% of the final grade.
- **Final Exam**: [redacted] room TBA. The final exam will be cumulative, with an emphasis on the material covered after the second exam. The final exam will count as **30**% of the final grade.
- **Instructor's portion**: 20% (homework, quiz, attendance, class participation, etc). This portion is determined by each section instructor.

Note: If your final exam score exceeds the average of your Exam 1 and Exam 2 scores, then your final exam will count 35% (instead of 30%) and each of Exams 1 and 2 will count only 22.5% (instead of 25%).

Grading Scale

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

There is no rounding of grades in this course. For example, an 89.99 is an $A-$.

WebAssign Homework: The homework assignments will be assigned weekly and will cover each time the material of the previous week. The due dates for homework assignments are posted in the WebAssign calendar. Homework assignments are generally due on Wednesdays and Fridays at 11:59 PM of each week. The WebAssign on-line system for homework is required, to which you must purchase an access code. You can purchase a WebAssign access code and register into your WebAssign course through the registration link posted on your Canvas course. Once you register into the WebAssign course you will be able to complete all homework assignments. If the Canvas page is down you can still access WebAssign to do your work through the WebAssign website. You do not need a Class Key to enroll in your WebAssign course.

Late Homework Policy: Late homework assignments will not be accepted nor extended in this course for any reason. Instead, I will drop your two lowest homework scores. So, if you miss an assignment, it will not be extended, but it may be dropped. If you add the course late, it is your responsibility to catch up on assignments. The due dates are set such that the first assignment is due one day after the last day to add/drop a course. This way, you can complete the first set of assignments even if you add the course late. Extensions on assignments due to extenuating circumstances might be considered individually with supporting documentation.

Quizzes: A short quiz is normally given each week at the discussion meetings (except in the first and last weeks of classes, and except in weeks of mid-semester exams). Your lowest two quiz scores will be dropped. This is to allow for all reasons for missing quizzes, including illness, emergencies, officially excused absence from campus. There will be no make-up quizzes unless there are extenuating circumstances; documentation in such cases will be required.

Exam Policy: All exams are closed-book. Calculators, textbook, notes, formula sheets, cell phones, smartwatches and any electronic devices are NOT permitted on the exams for any reason. Having cell phones or any electronic device on and visible during the exams will lead to an assumption of cheating. You must bring your student ID to each exam.

Make-Up Exam Policy: Make-ups for mid-semester exams are scheduled on the day following the exam. You may request a make-up exam according to the make-up exam policy, if you have a documented and valid reason for missing an exam.

Exam/Class Conflict: If you have two exams scheduled during the same time period, or a class during our scheduled exam, you are eligible for a make-up exam. You must submit your make-up exam request through SPIRE. documentation The Registrar's Office will let you know for which course you should take a make-up exam and notify your instructor at least two weeks before the scheduled exam.

Medical Reasons: If you will be absent from an exam due to medical reasons, you should notify your instructor in advance of the exam. If you have a medical emergency, you should notify your instructor as soon as possible. In either case, you may need to provide supporting documentation. You need not disclose any details of the reason for a medical excuse, but there must be enough information to allow the absence to be excused.

Religious Observance: In the case of absence from an exam due to religious observance, ask your instructor to confirm to the Course Chair that you provided the specified notification at the beginning of the semester.

Other Circumstances: It is impossible to anticipate all of the possible things that can occur. In case of an exceptional event beyond those covered above, contact your instructor and explain the problem. (You should be prepared to provide a written statement if necessary.) Your instructor and the course chair will evaluate the reasons that you have given and come to a decision.

Make-up exams will NOT be given to accommodate travel plans. Please plan accordingly.

Note that there is no re-taking of exams in this course for any reason. So, if you are sick and take the exam anyway, you cannot re-take the exam later for a better grade. Regardless of the situation, if you do not feel you can take the exam on the scheduled date notify your instructor immediately. Once you take the exam, there is nothing that can be done to change the grade.

Attendance Policy: You are expected to attend regularly all classes and are responsible for anything you miss. Students are also expected to notify their instructors when illness or other extenuating circumstances prevents them from attending class. Your instructor will tell you whether the attendance is required.

Canvas: We will be using Canvas for this class. Canvas is UMass Amherst's official learning management system (LMS). Canvas is known for its flexibility, ease of use, and mobile capabilities. To log in to Canvas with your `NetID@umass.edu` and password.

Gradescope: Your midterm exams, final exam and quizzes will be graded through Gradescope. You don't need the course entry code, so you will be enrolled in the Gradescope course.

Help and Resources: The best way to get help is to attend your instructor's or TA's office hours. The Calculus Tutoring Center, located in LGRT 140, is a also resource for students taking Math 132, and it will be open on September 9.The Learning Resource Center is the central academic support unit for The University of Massachusetts Amherst. The LRC has a variety of free academic support programs including one-on-one peer tutoring, study skills tutoring and Supplemental Instruction (SI) and exam review sessions. The SI sessions start the week of September 9.

Accommodation Statement: The University of Massachusetts Amherst is committed to providing an equal educational opportunity for all students. If you have a documented physical, psychological, or learning disability on file with Disability Services (DS), you may be eligible for reasonable academic accommodations to help you succeed in this course. If you have a documented disability that requires an accommodation, please notify me within the first two weeks of the semester so that we may make appropriate arrangements. For further information, please visit Disability Services (`https://www.umass.edu/disability/`).

Students who receive testing accommodations will take their semester exams on the same day as the scheduled exam starting at 5 pm, rather than 7 pm. Please schedule to take your final exam with the Office of Disability Services at least three weeks before the final exam.

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.

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`).

Drops, Withdrawals, Pass/Fail, Incomplete: Last day to add or drop with no record is [redacted] Last day to drop with "W" and select 'P/F' is [redacted] 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's a good chance you'll complete the course with a passing grade within the allotted time. Thus, failing work is no reason in itself for an Incomplete.

General Education Designation

MATH 132 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 webpage.

Learning Outcomes for all General Education courses

The General Education Program has four common objectives that pervade all designations. Math 132 satisfies the following General Education objectives:

- *Content*: Know fundamental questions, ideas, and methods of inquiry/analysis used in mathematics: Students will learn the Fundamental Theorem of Calculus, techniques of integration and its real-life and theoretical applications, along with the concepts of sequences and series.

- *Critical Thinking:* Students demonstrate creative, analytical, quantitative, & critical thinking through inquiry, problem solving, & synthesis: Students will use critically thinking skills to develop and understand cumulative change of a function, and computational skills to find this cumulative change efficiently. Students will demonstrate an understanding of various integration techniques in order to solve many different types of integrals. In determining the convergence of infinite sequences and series, students will develop formal reasoning skills to determine which test of convergence is applicable and what conclusions can be drawn.

- *Communication:* Develop informational and technological literacy: Students will develop their writing skills in articulating their reasoning of testing convergence of series. Additionally, in learning estimations for cumulative change, students will develop methods of error analysis used to quantitatively evaluate the accuracy of their results.

- *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, such as finding how far an object moves based on the force applied to it and derive the formulas of volume for 3dimensional solids of revolution, such as a sphere. Students will also learn how to use the integral to solve problems concerning areas of enclosed regions, lengths of curves, population predictions, work, among many others. Students will be able to demonstrate an understanding of sequences and series in order to develop various techniques to solve application problems.

Learning Outcomes for the R1 and R2 Designations

Because Math 132 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 132, students will think critically about the overarching idea of cumulative change by furthering their understanding of integrals. Students will advance their mathematical literacy and analyzing skills by learning to construct new methods of both estimating and computing cumulative change more accurately and efficiently. Additionally, students will develop formal reasoning skills to determine whether sequences and series converge, and in the case where they converge the computational skills to determine the value to which they converge.

- *Increase the student's sophistication as a consumer of numerical information:* Students will connect the ideas of rates of change and cumulative 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.

Math 132 Course Topics - [redacted]

Chapter 5 - Integrals

5.3 The Fundamental Theorem of Calculus

5.4 Indefinite integrals and the Net Change Theorem

5.5 The Substitution Rule

Chapter 6 - Applications of Integration

6.1 Area Between Curves

6.2 Volumes

Chapter 7 - Techniques of Integration

7.1 Integration by Parts

7.2 Trigonometric Integrals

7.3 Trigonometric Substitution

7.4 Integration of Rational Functions by Partial Fractions

7.5 Strategy for Integration (Review)

7.8 Improper Integrals

Chapter 11 - Infinite Sequences and Series

11.1 Sequences

11.2 Series

11.3 The Integral Test and Estimates of Sums

11.4 The Comparison Tests

11.5 Alternating Series and Absolute Convergence — *except* subsection Rearrangements

11.6 The Ratio and Root Tests

11.7 Strategy for Testing Series (Review)

11.8 Power Series

11.9 Representation of Functions as Power Series

11.10 Taylor and Maclaurin Series — *except* subsection Multiplication and Division of Power Series and Binomial Series Functions of Several Variables

Chapter 10 - Parametric Equations and Polar Coordinates

10.1 Curves Defined by Parametric Equations

10.2 Calculus with Parametric Curves — *only* subsections Tangents and Arc Length (*not* subsections Area and Surface Area)

10.3 Polar Coordinates

10.4 Calculus in Polar Coordinates

Math 132 Calculus II - [redacted]

Tentative Course Schedule

Week	Lectures	Events
Sept 3	Intro, 5.3, 5.4	First Day of classes: [redacted]
Sept 9	5.5, 6.1	Last day to add/drop any class - [redacted]
Sept 16	6.2, 7.1	
Sept 23	7.2, 7.3	
Sept 30	7.4, 7.8	
Oct 7	11.1 7.5 (review), Review	**Exam 1:** [redacted]
Oct 14	11.2, 11.3 (Start)	Holiday – Indigenous People Day: [redacted] [redacted]: Monday class schedule will be followed
Oct 21	11.3 (end), 11.4	
Oct 28	11.5, 11.6	Last day to Drop w/ 'W' and 'P/F': [redacted]
Nov 4	11.8	[redacted]
Nov 11	11.9, 11.7 (review) Review	Holiday – Veterans' Day: [redacted] **Exam 2:** [redacted]
Nov 18	11.10, 10.1	
Nov 25	10.2	[redacted] Thanksgiving recess begins after last class Classes resume: [redacted]
Dec 2	10.3, 10.4	
Dec 9	Review	Last day of classes: [redacted] Reading Day: [redacted] Final examinations begin - [redacted] [redacted] **AM**