# MAC 2233: Survey of Calculus 1

# SPRING 2026 Online

# SYLLABUS/CALENDAR

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**MAC2233 Spring 2026 Class Numbers and Meetings:**

| Course | Class/Section Number | Course Title | Class Meetings |
|---|---|---|---|
| MAC2233 | 12497 / 05H4 (DER) | Survey of Calc 1 | None/Asynchronous |
| MAC2233 | 12498 / 103A (UFO) | Survey of Calc 1 | None/Asynchronous |
| MAC2233 | 12504 / 187C (RES) | Survey of Calc 1 | None/Asynchronous |

**Course Instructors**

Name: **Dr. Alex York**

Office Hours: Mondays, Wednesdays, and Fridays 12:30-1:30PM EST, through Zoom (or by Appointment via Zoom)

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Office Hours: Thursdays 12:50-2:45PM EST, through Zoom (or by Appointment via Zoom)

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Course homepage is located on Canvas, http://elearning.ufl.edu.

**Catalog Description:** Geometric and heuristic approach to calculus; differentiation and integration of simple algebraic and exponential functions; applications to graphing, marginal analysis, optimization, areas and volumes.

**Course Description:** MAC 2233 is the first in the two-semester sequence, MAC 2233 and MAC 2234, surveying the important ideas of calculus but emphasizing its applications to business, economics, life, and social sciences. The course covers important precalculus topics: basics of functions and graphing and their applications as models (linear, quadratic, rational,

exponential, and logarithmic), as well as calculus topics: limits, differentiation and applications of the derivative, introduction to integration and its applications including area (volume is not covered). This course does not cover trigonometry.

**Course Goals:** The following is a list of topics and ideas that will be explored in the course and ultimately what should be achieved by completing the course:

- Students will study the fundamental ideas of limits, continuity, and the derivative, including their definitions and practical applications.
- Students will examine techniques for computing derivatives of algebraic, exponential, and logarithmic functions commonly used in business, economics, and the social sciences.
- Students will explore the interpretation of the derivative as a rate of change and apply it to real-world problems such as marginal analysis, optimization, and related rates.
- Students will investigate the concept of the definite integral as an accumulation function and will study basic integration techniques relevant to business and life-science applications.
- Students will analyze mathematical models based on functions, derivatives, and integrals, and consider how these models describe quantitative relationships in various contexts.
- Students will study how calculus can be used to interpret and solve problems involving cost, revenue, profit, elasticity, and growth.

**General Education Credit:**

**Mathematics**

This course accomplishes the General Education objectives of the subject area listed above. A minimum grade of C is required for General Education credit. Courses intended to satisfy General Education requirements cannot be taken S-U. At the end of the course, the students are expected to have achieved the General Education Student Learning Outcomes (SLOs), which are listed below

**Student Learning Outcomes (SLOs)**

At the end of this course, students will be expected to have achieved the General Education learning outcomes as follows:

- **Content:** Employ strategies in fundamental mathematics, including at least one of the following: solving equations and inequalities, logic, statistics, algebra, or trigonometry.

  After completing this course, students will be able to employ strategies in solving problems by evaluating:
  - Limits of functions

  - Differentiation of a wide variety of functions
  - Integration through evaluation and finding antiderivatives

(Content for Gen Ed Math, assessed through homework, lectures, quizzes, and exams.)

- **Communication:** Formulate mathematical models and arguments. Communicate mathematical solutions clearly and effectively.

  Throughout this course students will formulate and solve mathematical models and communicate the solution methodology and conceptual nature using:
  - Algebra and algebraic notation
  - Expressing a variety of functions algebraically and geometrically such as polynomials, exponential, and logarithmic functions
  - Notating differentiation and integration of functions and writing written solutions to evaluations of these quantities.

(Communication for Gen Ed Math, assessed through homework, lectures, quizzes, and exams.)

- **Critical Thinking:** Reason in abstract mathematical systems and use mathematical models to solve problems. Apply mathematical concepts effectively to real-world situations.

  Throughout this course, students will reason in abstract mathematical systems, and they will apply mathematical models to
  - Business, economics, life, and social sciences using
    - Algebraic, exponential, and logarithmic functions
    - Differentiation and integration
    - Calculation of exact areas between curves
    - Applications of rates of change
    - Identifying the limits of algebraic and transcendental functions
    - Using the derivative as a tool for approximation through differentials and linear approximation
    - Solving optimization problems, among other applications of calculus to solving problems.
    - They will also develop and solve mathematical models of real-world word problems.

  (Critical Thinking for Gen Ed Math, assessed through homework, lectures, quizzes, and exams.)

**Course Materials:** There are no required materials for this course; specifically, there is no required textbook, clicker, or online homework code that you must purchase for this course. In this course we will utilize a free online homework system known as Xronos. This work is supported by the Office of the Provost and the College of Liberal Arts and Sciences. The platform is accessible through the Canvas site via the “assignments” tab or through the provided configuration link on Canvas.

Students who are in the UFO or DER sections (see list at beginning of syllabus) have a $3.00 fee associated with the course from the math department. Students who are in the RES section (again, see list at beginning of syllabus) have a $24.99 distance learning fee associated with the course.

A recommended supplemental textbook is the OpenStax Calculus Volume 1 (link: https://openstax.org/details/books/calculus-volume-1 ). This textbook covers all the topics from our course except it may include the usage of trigonometry for certain topics which you can ignore. There are examples and problems entirely without trigonometry for which you can get additional information and practice by reading the book sections and examples and completing exercises.

**Requirements:** A hardwired connection (not wireless) is strongly recommended when working and submitting assignments. It is the student's responsibility to have a reliable internet connection, adequate internet speed and a cleared cache/cookies before starting each assignment.

**Time commitment:** University students are expected to spend at least 3 hours for each hour watching lecture videos in order to keep up with the course material.

**Canvas Messages:** Check your messages **daily** so that you do not miss any important announcements.

**Content:** In this course we will utilize an in-house interactive online homework system developed by the math department at UF. This platform, called Xronos, is free of charge. The lecture videos are embedded, along with supplementary videos and interactive content spread throughout for asyncronous learning in the course. In addition, we remind you that lectures and the lecture notes given in this class are the property of the University/faculty member and may not be taped/shared without prior permission from the lecturer and may not be used for any commercial purpose. Students found to be in violation may be subject to discipline under the Student Conduct Code.

There is a single Xronos 'assignment' in Canvas for each module which is an interactive set of course notes that presents the material. It has numerous interactive features as well as examples and problems scattered throughout. Each assignment is due the day before the relevant module exam, but it may be worked on (no longer for credit after the due date) for the entire semester, in the event a student wants to do work for review in preparation of taking an exam or the final. I recommend you do not try to complete the entire assignment at the end of the module. First, there is simply too much to do all at once, and second it is intended as one of the primary sources of learning for the exams and content. Your best bet is to be diligent and do them throughout the semester along the provided timeline located within each module to maximize learning and retention of the material.

There are some notes to keep in mind about how Xronos works:

- Canvas may (and almost certainly will, often) tell you that a grade has been submitted for the "Xronos assignment" when you first work on it (possibly whenever you work on it, depending on your Canvas settings). Rest assured that canvas really

means that a grade update has been submitted, not a final grade. You can continue working on Xronos and accumulating points, right up until the Xronos assignment is due; there is no "final submission" of a grade prior to that, regardless of what canvas might try to tell you.

- In most of the tiles of the interactive texts are lecture videos. Completing watching these counts toward credit for completion for the tile, so you must watch the videos in order to get full credit for the tile (and thus the Xronos assignment).

- Throughout the text there are problems embedded in the text to monitor learning and give examples. These are counted as part of the grade, and you are required to complete these to get credit for the assignment. These are often static problems, ie each student will have the same problems with no randomization. You are free to work together on these problems, but keep in mind they are intended as practice, and as such **you are responsible for knowing the material covered in the homework.**

- There are special thin tiles that are practice tiles. These typically (but not always) include a video showing how to work through problems of this type. This video needs to be completed for full credit but you can skip to the end of the video to count it "completed" if you don't wish to watch the entire video. These practice tiles are almost always procedurally generated problems that allow you to "try another" via the green button in the top right corner. This will generate another problem for you to try, allowing for nearly unlimited practice problems. Note that you need to make sure you have 100% completion of the tile before hitting the "try another" button to ensure you get full credit for the assignment, more on this can be found in the orientation video on Xronos.

**Xronos Assignments**: Doing each of the assigned Xronos sections and watching the embedded lecture videos is essential to success in this course and is one of the best ways to prepare for quizzes and tests. Each assignment has **unlimited attempts**.

**Quizzes:** Quizzes will be administered inside canvas. These will be twenty-five minute assessments to keep you up to date on the content as we progress through the course. There are thirteen quizzes offered, but we will count the top ten grades (meaning you get to drop three quizzes). Keep in mind, with the way the course is structured, assessments will get progressively harder as we go through the semester. This means if you skip a quiz early on and decide it will be a "drop" quiz, that you will be trading a much easier quiz for a much harder one later.

Also keep in mind that quizzes are "due" right before the relevant exam, but there is a recommended timeframe to complete them up as we progress through the semester. Since the recommended timeframe would normally be when quizzes are due, and all the quizzes are due later, you are effectively getting free "extensions" on all the quizzes automatically. For this reason no extensions will be granted to complete quizzes or makeup missed quizzes.

**Exams**: Exams in this course will be proctored using a proctoring service called Honorlock. Information on how to sign up for Honorlock will be posted to canvas.

There are four exams during the semester, with a final at the end (for a total of five tests). The time and content for each exam are as follows:

| Exam | Date | Content |
|---|---|---|
| Exam 1 | Feb 6 | Limits |
| Exam 2 | Mar 6 | Theory of Derivatives |
| Exam 3 | Apr 3 | Applications of Derivative |
| Exam 4 | Apr 22 | Integration |
| Final | April 25 | Cumulative: All Content |

**Final Exam**: There will be a final exam on April 25th. Your final will be cumulative, thus any content covered this semester is "fair game" for the final (including any content covered after the fourth exam). The exact format of the final will be announced as we get closer to the date. Since the final is cumulative, I will replace your lowest exam score with half the points you earn on the final (only if it helps. Notice that the final is worth twice the points of a standard exam, thus half the points on the Final will be equivalent to the number of points on a single exam). This will be done automatically, You do not need to request this.

**Grades:** Grading will be in accordance with the UF policy stated at https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx .The following table lists the assignment types and their point value(s):

| Assignment | Points | Total Points |
|---|---|---|
| Xronos | 50 | 50 |
| Quizzes (10 of 13) | 10 | 100 |
| Exams (4 total) | 50 | 200 |
| Final | 100 | 100 |
| **Total Points** | | 450 |

| Grade | Point Range | Grade | Point Range |
|---|---|---|---|
| A | 405-450 | C | 315-329 |
| A- | 390-404 | C- | 300-314 |
| B+ | 375-389 | D+ | 285-299 |
| B | 360-374 | D | 270-284 |
| B- | 345-359 | D- | 255-269 |
| C+ | 330-344 | E | 0-254 |

A minimum grade of C is required for general education credit.

A grade of C- or lower does not satisfy this requirement. If you have a grade dispute, you have **one week** to resolve it with your instructor after the assignment deadline.

**Syllabus Policies**: All policies in this syllabus adhere to the UF Policy of Course Syllabuses which can be found at https://go.ufl.edu/syllabuspolicies .

Please see that page regarding the Course policies and UF policies on Academic Honesty, Class Attendance, Students with Accommodations and/or Disabilities, In-Class Recordings and the Usage or Recorded Materials, Course Evaluations, and various Campus Resources. Certain policies are listed out below for additional clarity for our course.

**Accommodations for students with learning disabilities:** Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. See the "Get Started With the DRC" webpage on the Disability Resource Center site. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

**Makeup Policies:** If you miss an exam with valid documentation, you may take a makeup. Valid documentation includes documented illness, school sponsored activity, death in the immediate family, court-ordered or military appointments, and religious holidays. Scheduled flights do not count as valid documentation so do not make plans for a flight which conflicts with exam dates and times. If you miss a second exam, the comprehensive final exam will replace it. Exam makeups will be scheduled after discussion with the course instructor.

If illness or other extenuating circumstances cause you to miss an exam, contact the course instructor immediately (no later than 24 hours after the exam) by email. Then, as soon as possible after you return to campus, bring the appropriate documentation to the course instructor.

To be eligible for a make-up you must have completed at least 75% of the course work that has been given so far.

**Evaluations**: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online. Students can complete evaluations in three ways:

1. The email they receive from GatorEvals
2. Their Canvas course menu under GatorEvals
3. The central portal at https://my-ufl.bluera.com

Guidance on how to provide constructive feedback is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

**Tentative Course Progression and Due dates** (subject to possible revision)

| Week | **Recommended Assignments and Progression** | **Assignments/Exams** | **Due Date** |
|---|---|---|---|
| **Module 1: Precalculus Review and Needs Assessment** | | | |
| 1 | Orientation Module, Module 1 | Orientation Quiz, Needs Assessment | Friday Jan 16th |
| **Module 2: Limits** | | | |
| 2 | Xronos Module 2; Sections 1 & 2 | | N/A |
| 3 | Xronos Module 2; Sections 3 & 4 | | N/A |
| 4 | Xronos Module 2; Sections 5 & 6 | Quizzes 1-3, Module 2 Xronos & Exam 1 Due | Friday Feb 6th |
| **Module 3: Theory of Derivatives** | | | |
| 5 | Xronos Module 3: Sections 1 & 2 | | N/A |
| 6 | Xronos Module 3: Sections 3.1-3.5 | | N/A |

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|---|---|---|---|
| 7 | Xronos Module 3: Sections 3.6-3.12 | | N/A |
| 8 | Xronos Module 3: Sections 4 & 5 | Quizzes 4-7, Module 3 Xronos & Exam 2 Due | Friday Mar 6th |
| **Module 4: Application of Derivatives** | | | |
| 9 | Xronos Module 4: Section 1 | | N/A |
| 10 | **Spring Break: No Classes** | | Mar 16th-20th |
| 11 | Xronos Module 4: Sections 2 & 3.1 | | N/A |
| 12 | Xronos Module 4: Sections 3.3-3.10 | Quizzes 8-10, Module 4 Xronos & Exam 3 Due | Friday Apr 3th |
| **Module 5: Introduction to Integration** | | | |
| 13 | Xronos Module 5: Section 1 | | N/A |
| 14 | Xronos Module 5: Sections 2 & 3 | | N/A |
| 15 | Xronos Module 5: Sections 4, 5 & 6 | Quizzes 11-13, Modules 5 Xronos & Exam 4 Due | Wed Apr 22 |
| 16 | **Final Exam** | | Sat Apr 25 |

**Course Outline by Module with Topics, Video Lengths, and Assessments**

**Module 1: Orientation and Needs Assessment**

- Complete Orientation Module (time estimate: 1 hour)
  - Watch Course Introduction Video (11:17)
  - Watch Instructor Introduction Video (~15 minutes (varies by semester) exact length will be conveyed at start of term)
- Complete Module 1
  - Complete the assignments
    - Orientation Quiz
    - Needs Assessment

**Module 2: Limits**

- Module 2 Xronos Sections and Quizzes
  - Section 1
    - Geometric View of Limits
      - Video (3:14)
    - Geometric View of One-Sided Limits
    - Analytic Approach to Limits with Tables
      - Video (11:16)
    - Analytic Approach to Limits, One-Sided Limits, and Algebraic Notation
      - Video (6:05)
  - Section 2
    - Limit Laws
      - Video (13:36)
  - Quiz 1 (Sections 1 and 2)
  - Section 3
    - Continuity, Limit Laws, Piecewise Functions, Discontinuities

        - Video (11:57)
    - The Intermediate Value Theorem
        - Video (6:55)
- Section 4
    - Indeterminate Forms
        - Video (15:51)
    - Limits at Infinity
        - Video (8:10)
    - Limits of the form Zero/Zero
    - Limits of the form Nonzero/Zero
- Quiz 2 (Sections 3 and 4)
- Section 5
    - Vertical Asymptotes; Definition and Limits
        - Video (10:57)
    - Horizontal Asymptotes; Definition and Limits
        - Video (12:37)
- Section 6
    - Limits and Velocity
    - Instantaneous Velocity
        - Video (16:16)
- Quiz 3 (Sections 5 and 6)

- Exam 1 (Module 2 Material)

**Module 3: Theory of Derivatives**

- Module 3 Xronos Sections and Quizzes
    - Section 1
        - Overview of Theory of Derivatives
            - Video (4:01)
        - Geometric View of Derivatives
            - Video (4:31)
        - Analytic View of Derivatives and Definitions
            - Video (7:41)
    - Section 2
        - Derivative as a Function
            - Video (12:59)
        - Continuity and Differentiability
            - Video (9:42)
    - Quiz 4 (Sections 1 and 2)
    - Section 3
        - Derivative Rules Sum/Difference
            - Video (9:50)
        - Polynomial Rule

        - Video (16:42)
    - Product Rule
        - Video (13:24)
    - Quotient Rule
        - Video (8:31)
  - Quiz 5 (Section 3 through Quotient Rule)
    - Chain Rule
        - Video (10:56)
    - Additional Chain Rule Usage and Examples
        - Video (4:43)
    - Implicit Differentiation
        - Video (26:53)
  - Quiz 6 (Rest of Section 3)
  - Section 4
    - Derivatives of Exponential Functions
        - Video (20:12)
    - Derivatives of Logarithmic Functions
        - Video (8:02)
  - Section 5
    - Logarithmic Differentiation
        - Video (13:57)
  - Quiz 7 (Sections 4 and 5)
- Exam 2 (Module 3 Material)

**Module 4: Application of Derivatives**

- Module 4 Xronos Sections and Quizzes
  - Section 1
    - Local Extrema; Increasing and Decreasing Functions
        - Video (9:41)
    - Extreme Value Theorem
        - Video (11:01)
    - Absolute Extrema
        - Video (11:04)
  - Quiz 8 (Section 1)
  - Section 2
    - Geometric View of Concavity
        - Video (4:33)
    - Analytic View of Concavity
        - Video (10:26)
    - Geometric View of Points of Inflection
        - Video (8:43)
    - Analytic View of Points of Inflection

        - Video (3:52)
    - Second Derivative Test
        - Video (9:43)
  - Section 3
    - Newtonian Mechanics
        - Video (11:28)
  - Quiz 9 (Section 2 and Newtonian Mechanics)
    - Graphing Functions
        - Video (12:27)
    - Geometric View of Linear Approximation
        - Video (10:40)
    - Analytic View of Linear Approximation
        - Video (9:03)
    - Related Rates
        - Video (10:12)
    - Optimization
        - Video (14:36)
  - Quiz 10 (Graphing Functions to Optimization)
- Exam 3 (Module 4 Material)

**Module 5: Introduction to Integration**

- Module 5 Xronos Sections and Quizzes
  - Section 1
    - Sigma Notation
        - Video (21:01)
    - Introduction to Antiderivatives
        - Video (5:11)
    - Antiderivatives of Core Functions
        - Video (25:01)
  - Quiz 11 (Section 1)
  - Section 2
    - Area under the Curve and Introduction to Riemann Approximations
        - Video (5:54)
    - Mechanics of Riemann Approximations
        - Video (43:13)
  - Section 3
    - Definition of the Definite Integral
        - Video (4:37)
    - The Definite Integral
        - Video (4:17)
  - Quiz 12 (Sections 2 and 3)
  - Section 4

        - The Indefinite Integral
            - Video (4:22)
        - Classes of Functions and Indefinite Integrals
            - Video (16:52)
    - Section 5
        - The First Fundamental Theorem of Calculus
            - Video (7:42)
        - The Second Fundamental Theorem of Calculus
            - Video (4:11)
    - Section 6
        - U-Substitution
            - Video (11:39)
        - How to Identify a U-Substitution
            - Video (14:14)
    - Quiz 13 (Sections 4, 5, and 6)
- Exam 4 (Module 5 Material)

**Final Exam is Cumulative (Modules 2-5)**

**This syllabus is subject to change. You will be notified if any changes are made.**