

UAF & DMS SYLLABUS GUIDELINES FOR MATH251X – CALCULUS I

Across all sections of Calculus I offered by UAF campuses (delivered in person or online), all syllabi must satisfy the following requirements.

1. General guidelines set by UAF; follow this link to the [UAF syllabus requirements](#)
2. Content

- *Calculus: Early Transcendentals* (for Calculus I-III) or *Single Variable Calculus: Early Transcendentals* (for Calculus I-II) by James Stewart, 8th edition is the textbook adopted by DMS and must be used for the course.
- All of the required (r) sections from the textbook listed below must be covered. Optional (o) topics should be considered as time permits.
 - Chapter 1: 1.1-1.5 (r)
 - Chapter 2: 2.1-2.8 (r)
 - Chapter 3: 3.1-3.10 (r), 3.11 (o)
 - Chapter 4: 4.1-4.7, 4.9 (r), 4.8 (o)
 - Chapter 5: 5.1-5.5 (r)

Review of relevant precalculus and trigonometry material is strongly recommended.

3. Prerequisites

- Placement into MATH251X by the UAF Math Placement. Students who have not met the current placement requirements will be dropped within the first two weeks of the course.
- Any student who has previously received a D, W or F in MATH200X or MATH251X must have received a P in MATH251R or must be concurrently enrolled in MATH251S. Students in this situation who have not met one of these conditions will be dropped from the course.

4. Types of Assessments

- Exams
 - at least two exams during the semester
 - exams must be timed, proctored, closed book, closed notes and no calculators
 - exams must be majority written answer (not multiple choice)
 - exams must be paper-and-pencil exams, written and graded by faculty members
 - exams should not be reused from previous semesters, limited reuse of edited problems is acceptable
- Final Exam
 - must be cumulative and representative of the entire course
 - any optional section that you choose to cover should not be on the final exam
 - must include problems from each Assessment Criteria listed on the next page
- Other Assessed Work
 - instructors should provide written feedback to students approximately weekly throughout the semester. This can be through humanly-graded assignments or email correspondence

5. Grading Policy

- The syllabus must include a grading scale of some form.
- Plus/minus grading is at the discretion of the instructor, but must be stated explicitly.
- The final grade in this course must adhere to the following:

Written Assessed Work	At least 15% and at most 30%
Online Assessed Work	At most 15%
Midterm Exams	At least 40%
Comprehensive Final Exam	At least 20%

Assesment Criteria

Final exams should contain problems that demonstrate the students' acquired knowledge of the following topics.

- Limits of functions, including rational, exponential, and trigonometric
 - one-sided
 - two-sided
 - infinite
- Continuity
- Ability to find derivatives
 - the definition of the derivative
 - basic rules of differentiation (including sum/difference, product, quotient, chain rule)
 - derivatives of various types of functions including: polynomials, rationals, exponentials, logarithms, trigonometric, inverse trigonometric
 - derivatives using implicit and logarithmic differentiation
- Understand behavior of functions by examining derivatives and limits
 - slope
 - extrema
 - concavity
 - inflection points
 - asymptotes and end-behavior
- Ability to apply derivatives to word problems such as
 - optimization
 - related rates
 - linear approximations or differentials
 - growth and decay
- Ability to find integrals
 - using basic properties
 - using the fundamental theorem of calculus
 - using substitution
 - using the definition of the definite integral

Final exams will be evaluated by the Core Assessment Committee based on the described desired outcomes for the course. Six questions on the exam corresponding to six of the bulleted points above will be chosen for closer review. The overall content of the exam and students' ability to write proper mathematics will also be assessed.