

UAF & DMS SYLLABUS GUIDELINES FOR MATH230X – CALCULUS ESSENTIALS WITH APPLICATIONS

Across all sections of Calculus Essentials with Applications 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

- *Brief Applied Calculus*, 7th edition by Geoffrey C. Berresford and Andrew M. Rockett is the textbook adopted by DMS and must be used for this 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: 1.1-1.4 (r)
 - Chapter 2: 2.1-2.7 (r)
 - Chapter 3: 3.1-3.7 (r)
 - Chapter 4: 4.1-4.4 (r)
 - Chapter 5: 5.1-5.5 (r)
 - Chapter 6: 6.1-6.4 (r), 6.6-6.7 (o)

Review of relevant precalculus material is strongly recommended.

3. 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

4. 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 properties of derivatives(including product, quotient, chain rule)
 - derivatives of non-polynomial functions including: 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
 - graphing
 - optimization
 - related rates
 - growth and decay
 - elasticity of demand and relative rates
- Ability to find integrals
 - using basic properties
 - using the fundamental theorem of calculus
 - using substitution
 - using the definition of the definite integral
- Ability to apply integrals
 - average value
 - area between curves
 - consumer's and producer's surplus
 - elasticity of demand and relative rates

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.