Math 111 - Calculus I- Syllabus


Prerequisites: None. Students need a strong Precalculus background to do well.

Topics covered: This is a standard first semester Calculus course. Topics covered include derivatives and limits, max-min problems, related rates problems, antiderivatives, and the definite integral.

Detailed Syllabus: The following sections of the book should be covered:

- **Chapter 1, §1.1 – 1.3**
  Pre-Calculus Review
  (2 classes)

- **Chapter 1, §1.5 – 1.6**
  Exponential and logarithmic functions
  (2 classes)

- **Chapter 2, §2.1**
  Tangent lines and velocity
  (1 class)

- **Chapter 2, §2.2–2.3, 2.5–2.6**
  Limits and continuity
  (3 classes)

- **Chapter 2, §2.7 – 2.8**
  The derivative
  (3 classes)

- **Chapter 3, §3.1 – 3.3**
  Differentiation formulas, trig. formulas
  (3 classes)

- **Chapter 3, §3.4 – 3.5**
  The chain rule, implicit differentiation
  (2 classes)

- **Chapter 3, §3.6**
  Derivatives of logarithmic functions
  (1 class)

- **Chapter 3, §3.7 – 3.8**
  Exponential growth and decay (applications to Physics, Chemistry and Economics)
  (2 classes)

- **Chapter 4, §4.1–4.5, 4.7**
  Applications of differentiation
  (7 classes)

- **Chapter 4, §4.9**
  Antiderivatives
  (1 class)

- **Chapter 5, §5.1 – 5.5**
  The integral
  (6 classes)

- **Chapter 6, §6.1–6.2, 6.5**
  Applications of integration
  (3 classes)
Notes:

- The syllabus is based on a MWF schedule and leaves 5 classes for review and tests.
- The epsilon/delta definition of limit is not covered. (§2.4)
- It is obligatory to cover integration by substitution. (§5.5)
- Make sure to cover the applications to Economics and Business: Cost functions in §3.7 and marginal cost and revenue in §4.7. You can cover some life science applications if there is time.
- Typically, three tests are given during the semester. You should assign daily reading and homework, and either grade some written work or give regular quizzes, or some combination of the two.
- It is worth repeating, and testing the students on, the statement “the derivative is the slope of the tangent line.”

Calculators: Most instructors do not allow the use of calculators on exams, although calculators can be very useful for students to get a feel for the mathematics by doing concrete examples. Instructors need to be aware that new calculators can typically do symbolic differentiation and integration.