Math 1910   Calculus I   University of Memphis

Course Content: Major topics include finding limits of functions numerically, graphically, and algebraically, continuity of functions, finding derivatives using the difference quotient, power rule, sum and difference rules, product and quotient rules, and the chain rule, using derivatives to draw detailed graphs of functions and solve applications from business and science, exponential and logarithmic functions and their derivatives, graphs, and use in applications, antidifferentiation, finding both the definite and indefinite integrals, and using integrals to solve applications.

Prerequisites: One of the following criteria must be met to enroll in Math 1910:
    Both Math 1710 and Math 1720 with a grade of C- or better,
    Math 1730 with a grade of C- or better,
    A score of 76 or better on the ALEKS math assessment test.

Note: students with a stronger math background may be invited to take Honors Calculus I (Math 1421) in place of Math 1910. See http://www.memphis.edu/msci/ugrad/honors.php for more details. Students may not receive credit for both Math 1421 and Math 1910. Students who obtain a score of at least 4 on the AP Calculus AB series exam, or a score of at least 3 on the AP Calculus BC series exam can obtain credit for Math 1910 without taking the course.

Course Objectives: To expand students' problem solving skills with techniques from calculus. To develop students' proficiency for solving problems motivated by economics, biology, physics, and other sciences.

Course Materials: Textbook, *Calculus, Early Transcendentals Volume I*, 8th ed. by James Stewart; Graphing Calculator. Note: Graphing Calculators that do symbolic differentiation and integration are not allowed. Student Access Code for Webassign is required.

Tutoring: Free tutoring is available through the University's Education Support Programs. They offer a drop-in tutoring service in the Math Learning Center in DH 341 and online assistance.

Disabilities: Any student who anticipates physical or academic barriers based on the impact of a disability should contact Disability Resources for Students (DRS) at 110 Wilder Tower, 901.678.2880 at the earliest opportunity. DRS coordinates access and accommodations for students with disabilities. You must give your instructor a copy of any accommodation memos provided by the DRS **within the first week of class.**

Attendance: Attendance is important. Every student is required to be in class, on time, and stay for the entire class period for each class session. If you miss class you are responsible for finding out what topics were covered.

Grading Policy: Grades will be calculated based on homework and tests, and final exam. Grading scale is determined by the instructor.

Homework: Homework will be assigned for each section of the text and must be finished before the due date for you to receive credit.

No Make-ups for Tests: If you must miss a test because of an official school function you must schedule to take the test at a time prior to the original test date. No other rescheduling will be allowed.

Final Schedule: see http://www.memphis.edu/registrar/calendars/

Chapters and Sections to be covered:

Chapter 2: Limits and Derivatives
  2.1 The tangent and velocity problems
  2.2 The limit of a function
  2.3 Calculating limits using limit laws
  2.4 The Precise Definition of a Limit
  2.5 Continuity
  2.6 Limits at infinity and horizontal asymptotes
  2.7 Derivatives and rates of change
  2.8 The derivative as a function

Chapter 3: Differentiation Rules
  3.1 Derivatives of polynomials and exponential functions
  3.2 The product and quotient rules.
  3.3 Derivatives of trigonometric functions
  3.4 The chain rule
  3.5 Implicit differentiation
  3.6 Derivatives of logarithmic functions
  3.7 Rates of change in the natural and social sciences
  3.8 Exponential growth and Decay
  3.9 Related rates
  3.10 Linear approximations and differentials
  3.11 Hyperbolic functions

Chapter 4: Applications of Differentiation
  4.1 Maximum and minimum values
  4.2 The Mean Value Theorem
  4.3 How Derivatives affect the shape of a curve
  4.4 Indeterminate forms and L'Hospital's Rule
  4.5 Summary of Curve Sketching
  4.6 Graphing with Calculus and Calculators
  4.7 Optimization Problems
  4.8 Newton's Method
  4.9 Antiderivatives

Chapter 5: Integrals
  5.1 Areas and distances
  5.2 The definite Integral
  5.3 Fundamental theorem of calculus
  5.4 Indefinite integrals and the Net change Theorem
  5.5 The Substitution rule