

**Math 122 Syllabus**  
University of South Carolina  
Spring 2007

Course Information

- Math 122 - Calculus for Business Administration and Social Sciences
- Spring 2007, Section 13, MWF 2:30-3:20 PM, Callcott 011
- Instructor: Dr. John Lane (jlane@math.sc.edu)

Course Description from USC Math Department

Calculus for Business Administration and Social Sciences. (3 semester hours) (Prereq: qualification through placement or a grade of C or better in MATH 111 or 115) Derivatives and integrals of elementary algebraic, exponential, and logarithmic functions. Maxima, minima, rate of change, motion, work, area under a curve, and volume.

Course Description from Instructor

Calculus for Business Administration and Social Sciences. (3 semester hours) This course emphasizes practical applications of the derivative and integration. The text book uses examples from the fields of natural, biological, and social sciences and business to stress the relevance of calculus to the student's field of study. This course is designed to incorporate calculator usage in the learning process; students use calculators to assist in the graphing of functions, computing derivatives, and evaluating definite integrals.

The course begins with a study of functions including linear, exponential, logistic functions, and surge functions; these functions will be the prototypes for modelling information throughout the course. Applications of the derivative include measuring instantaneous rates of change, related rates and min/max problems. Applications of integral calculus includes probability (exponential and normal distributions), rates (i.e., position as an integral of velocity), work, and bio-availability.

Textbook and Topics Covered

Textbook: "Applied Calculus," Third Edition. Hughes-Hallett, Gleason, Lock, Flath, et al. John Wiley & Sons. 2006.

- Functions and Change (Chapter 1): What is a function?, Linear Functions, Rates of Change, Applications of Functions to Economics, Exponential Functions, Natural Logarithm, Exponential Growth and Decay, Polynomials, Periodic Function.
- Rate of Change: The Derivative (Chapter 2): Instantaneous Rate of Change, The Derivative Function, Interpretation of the Derivative, The Second Derivative, Marginal Cost and Revenue.

- Short-cuts to Differentiation (Chapter 3): Derivative Rules, Chain Rule, Product and Quotient Rule.
- Using the Derivative (Chapter 4): Local maxima and minima, inflection points, Global maxima and minima, Logistic Growth, Surge Function and Drug Concentration. Additional topics: Related Rate Problems.
- Accumulated Change: The Definite Integral (Chapter 5): Accumulated Change, Definite Integrals, Definite Integrals as Area, Interpretations of Definite Integral.
- Additional Topics: Average Value (Chapter 6.1), Present and Future Value (Chapter 6.3), and Probability using Exponential and Normal Distributions (Instructor's notes).

### Additional Materials

**Work sheets:** In addition to the textbook mentioned above, the instructor will provide work sheets in class throughout the semester. This work sheets will add to the learning process. Along with lectures, class time will be dedicated for work sheets, therefore class attendance is essential to learning the material that is presented in this course.

**Calculators:** Each student is required to have a graphing calculator. The calculator will be an essential tool in this course and its features will assist students in solving more advanced problems. It is highly recommended that students have a TI-83 Plus. Other graphing calculators are permissible but must have the same features of the TI-83 Plus to guaranteed that the student is able to solve problems as expected by the instructor.

### Grading Policy

The final grade will be a weighted average of the student's topic quiz average (60%) and homework average (40%). During the semester, approximately 12 topic quizzes will be given - students must pass these quizzes with a score of 7 or better. In the two weeks after the class has received the quiz back from the original taking of the quiz, students will have two opportunities to improve their original grade (in-class taking of the quiz). Any quiz that is not of the grade 7 or better will be recorded as a zero. These quizzes are intended to show that the student understands the fundamentals of the material presented in class. Homework average is based on homework assignments, homework quizzes, and in-class participation. Homework assignments will not be accepted late; there are no makeups for homework quizzes. It is expected that students show up for class - for every five missed classes, the overall grade of the student will be reduced by one letter grade. Students will receive an A if the overall average falls between 90 and 100, B if between 80 and 90, C if between 70 and 80, D if between 60 and 70, and F if below 60.