

MATH 125 - CALCULUS I - SYLLABUS

Fall 2016

TEXT: Essential Calculus **Second Edition**, by James Stewart, published by Cengage Learning /Thompson/Brooks-Cole. ISBN-10: 1-133-11229-3, ISBN13: 978-1-133-11229-7 [Essential Calculus is the text used at USC for all three semesters of Calculus: Math 125, Math 126 and Math 226.]

CHAPTER 1 FUNCTIONS AND LIMITS: Sections 1.1 to 1.6. Functions and their representations. Some standard functions. The limit of a function. Limit laws. Continuity. Limits involving infinity. 8 lectures.

CHAPTER 2 DERIVATIVES: Sections 2.1 to 2.8. Derivatives and rate of change. The derivative as a function. Basic formulas: the power rule, the product and quotient rules, the chain rule. Implicit differentiation. Related rates of change. Linear approximations. 10 lectures.

CHAPTER 3 APPLICATIONS OF DIFFERENTIATION: Sections 3.1 to 3.7. Maximum and minimum values. Mean value theorem. Concavity and points of inflection. Curve sketching. Optimization. Newton's method. Antiderivatives. 8 lectures

CHAPTER 4 INTEGRALS: Sections 4.1 to 4.5. Areas under curves. Riemann sums and definite integrals. Evaluation of definite integrals. Fundamental theorem of calculus. Integration by substitution. 8 lectures

CHAPTER 5 INVERSE FUNCTIONS: Sections 5.1 to 5.5. Inverse functions. Logarithm and exponential functions. Modeling with exponential growth and decay. 5 lectures

The number of lectures on each chapter is a suggestion. Some professors may spend more time on some topics and less on others. The suggested total of 39 lectures leaves some time available for midterm tests and review.

During the semester several computer based homework assignments will be set. The mathematical content of these assignments will be designed to reinforce some of the concepts covered in the syllabus. The assignments will use the computer package *Mathematica*. The *Mathematica* software is available on machines in the Mathematics Center KAP 263 and at the various USC Computer Centers in King Hall (KOH 206), Salvatori Computer Science Center (SAL 125), Waite Phillips Hall (WPH B34) and the Leavey Library Information Commons (LVL), see <http://www.usc.edu/its/pcc/>). It also available as a free download from ITS at <http://www.usc.edu/its/software/>.