MATH 126 - CALCULUS II - SYLLABUS

Prof. Baxendale - Fall 2012

TEXT: Essential Calculus **First Edition**, by James Stewart, published by Cengage Learning /Thompson/Brooks-Cole. ISBN-10: 0-495-01442-7 / ISBN-13: 978-0-495-01442-3.

[Essential Calculus is the text used at USC for all three semesters of Calculus: Math 125, Math 126 and Math 226. The second edition of this text has just appeared, and will be phased in semester by semester so that students already in the sequence will not have to switch editions. For the Fall 2012 semester Math 125 will use the second edition, but Math 126 and 226 will continue to use the first edition.]

CHAPTER 5 INVERSE FUNCTIONS: Sections 5.6 to 5.8. Inverse trigonometric functions. Hyperbolic and inverse hyperbolic functions. L'Hospital's rule. 6 lectures (including review of derivatives of trigonometric functions from Section 2.4 and inverse functions from Section 5.1).

CHAPTER 6 TECHNIQUES OF INTEGRATION: Sections 6.1 to 6.3, 6.5, 6.6. Integration by parts. Integration of trigonometric functions. Integration using trigonometric substitutions. Partial fractions and integration of rational functions. Numerical methods. Improper integrals. 8 lectures (including review of integration using substitution from Section 4.5).

CHAPTER 7 APPLICATIONS OF INTEGRATION: Sections 7.1 to 7.6. Areas between curves. Volumes, especially volumes of revolution. Arc length. Work. Hydrostatic pressure. Differential equations. 9 lectures (including review of Riemann sums from Chapter 4; in 7.5 omit moments and centers of mass).

CHAPTER 8 SERIES: Sections 8.1 to 8.8. Sequences. Series. Integral and comparison tests for convergence. Alternating series. Absolute and conditional convergence. Ratio test. Root test. Power series. Representations of functions as power series. Tayler and Maclaurin series with remainder estimates. The binomial series. Applications of Taylor polynomials. 14 lectures.

CHAPTER 9 POLAR COORDINATES: Sections 9.3 and 9.4. Polar coordinates. Tangent lines using polar coordinates. Areas and arc lengths in polar coordinates. 3 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 40 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/.