MATH 104/184 Course Outline
Differential Calculus with Applications to Commerce and Social Sciences
2012W Term 1

MATH 104 and MATH 184 are courses in differential calculus, with applications and examples drawn primarily from business and economics. These courses are equivalent in technical content to MATH 100/180/102 and serve as a pre-requisite for any of MATH 101/103/105. The text book for MATH 104/184 is *Single Variable Calculus: Early Transcendentals*, First Edition, by Briggs and Cochran. Any supplemental notes for specific topics will be posted on the main course website.

Please note that "Week" below typically means 3 lecture hours, but this will vary. There are two common midterms scheduled in the term, and both will take place in the evening. This course is heavily coordinated, but individual instructors will have their own style. Be assured that the content taught will be the same across all sections in spite of this, and that all sections will be prepared for the common midterms and common final exam.

Week 0 Introduction: Review of Exponentials, Logarithms, and Inverse Functions. Chapter 1.3.

Week 1 A standard business problem from managerial economics. (Notes). An Introduction to Limits. Chapter 2.1, 2.2, and 2.3 (to the end of Quick Check 3 on p. 70).

Week 2 Continuous Functions. Chapter 2.6 (to p. 97 plus the intermediate Value Thm). The Derivative. Chapter 3.1.

Week 3 Rules of Differentiation I. Chapter 3.2, 3.3. Chapter 3.4: only the table of derivatives Theorem 3.13 on p. 159. (We return to this section at the end of the course.)

Week 4 Derivative as rate of change. Chapter 3.5. The Chain Rule. Chapter 3.6.

Mid-term I (Thursday, October 4th, 6:30-7:30pm)

Week 5 Implicit Differentiation. Chapter 3.7 to the end of the section on Slopes of Tangent Lines, plus material on the power rule with rational exponents. Derivatives of Logarithms and Exponentials. Chapter 3.8.

Note: Thanksgiving holiday, Monday, October 8th.

Week 6 Derivatives of Logarithms and Exponentials Continued. Chapter 3.8. Applications: Elasticity of Demand (Notes to be posted online). Exponential Growth and Compound Interest. (Chapter 6.8 to the end of Example 3 plus online notes.).

Week 7 Related Rates. Chapter 3.10. Maxima and Minima. Chapter 4.1.

Week 8 Information in the first and second derivatives. Chapter 4.2. Asymptotes from Chapter 2.5. Graphing functions. Chapter 4.3.

Week 9 Optimization problems I. Chapter 4.4.

Mid-term II (Thursday, November 8th, 6:30-7:30pm)

Week 10 Optimization Problems Continued. Chapter 4.4. Linear Approximation. Chapter 4.5.

Note: Holiday in lieu of remembrance day, Monday, November 12th.

Week 11 Approximating Functions with polynomials Chapter 9.1.

Week 12 Approximating Functions with polynomials Continued Chapter 9.1. Inverse Trigonometric Functions.