MATH 104/184 Course Outline
Differential Calculus with Applications to Commerce and Social Sciences
2013W 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 *Calculus: Early Transcendentals*, First Edition, by Briggs and Cochran. There is a custom UBC edition, but used copies of any edition of the Early Transcendentals version will be fine. 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. These will be held in the early evening on each date.

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.

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.

Mid-term I. (Thursday, October 10th 6 p.m. to 8 p.m.)

Week 6 Derivatives of Logarithms and Exponentials. 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. (Some classes may be finishing material from Week 8.)

Mid-term II. (Thursday, November 7th 6 p.m. to 8 p.m.)

Week 10 Optimization Problems Continued. Chapter 4.4.

Week 11 Linear Approximation. Chapter 4.5. Approximating Functions with polynomials I. Chapter 9.1.

Week 12 Approximating Functions with Polynomials II. Chapter 9.1. Inverse Trigonometric Functions.