

Prepared by the Department of Mathematics

Date of Departmental Approval: May 1, 2006

Date approved by Curriculum and Programs: February 23, 2009

Effective: Fall 2009

1. **Course Number:** MAT185
Course Title: Business Calculus II
2. **Description:** This is the second in a two-course sequence designed for students seeking a background in mathematical modeling and applied calculus and/or intending to pursue transfer study in business administration or in social science disciplines requiring calculus. The topics covered include: the integral and its applications, and techniques of integration. Additional topics are selected from probability distributions, differential equations, multivariable calculus, and Taylor Series
3. **Student Learning Outcomes:**
Upon successful completion of this course, students are able to do the following:
 - apply basic integration formulas, integration by parts, integration by substitution to evaluate definite and indefinite integrals
 - solve applications using definite and indefinite integrals
 - graph conic sections and quadratic equations
 - find equation of conic sections by eccentricity
 - graph polar coordinates, conics and parametric equations
 - convert from polar to cartesian equations and from cartesian to polar equations
 - determine convergence and divergence of sequences and infinite series using geometric series, harmonics, integral test, comparison tests, ratio test, root test and alternating series
 - find power series, Taylor series and Maclaurin series
 - solve application problems
4. **Credits:** 3
5. **Satisfies General Education Requirement:** No
6. **Prerequisite:** MAT180 or equivalent
7. **Semester(s) Offered:** Varies
8. **Suggested General Guidelines for Evaluation:** Comprehensive final examination, hour tests, problems, cases, and quiz papers.
9. **General Topical Outline (Optional):** Please see the attached course outline.

MAT185. Business Calculus II
Content Outline

- I. Integration
 - A. Antidifferentiation
 - B. Some Applications of Antidifferentiation
 - C. The Definite Integral as the Area Under a Curve
 - D. Fundamental Theorem of Calculus
 - E. Some Applications of the Definite Integral
 - F. Area in the Plane
- II. Techniques of Integration
 - A. Integration by Substitution
 - B. Integration by Parts
 - C. Integration by Tables
 - D. Numerical Methods of Approximation
 - E. Improper Integration
- III. Differential Equations
 - A. Introduction to Differential Equations
 - B. Separation of Variables
 - C. Applications
- IV. Multivariable Calculus
 - A. Functions of Several Variables
 - B. Partial Derivatives
 - C. Maximum and Minimum
 - D. Lagrange Multipliers
 - E. The Method of Least Squares
 - F. Total Differentials
 - G. Double Integrals
- V. Probability and Calculus
 - A. Probability and Calculus
 - B. Random Variable, Expected Value, and Variance
 - C. Uniform and Exponential Random Variables
 - D. The Normal Distribution
- VI. Infinite Series and Other Advanced Topics
 - A. Geometric Series
 - B. Taylor Series
 - C. Integration of Series
 - D. Newton's Method
 - E. Indeterminate Forms/ *L'Hôpital's* Rule