## Proposed IAI Code M1 900-B

## City Colleges of Chicago Course Title: Calculus for Business and Social Science (IAI Code: M1 900-B)

Length of course: 16 Weeks

Contact Hours: 5 Contact Hours

Credit Hours: 5 Credit Hours

Lecture Hours: 5 Lecture Hours

### Lab Hours:

Weekly Plan: 5 Hours

#### Catalogue Description:

This course provides an introduction to differential and integral calculus with specific applications to business and social science. The use of technology (e.g., graphing calculator, an algebraic system, etc.) and writing as appropriate to the discipline will be emphasized in this course.

#### Students the Course is Expected to Serve:

This calculus course is designed specifically for students in business and the social sciences and does not count toward a major or minor in mathematics.

#### **Pre-requisites:**

Prerequisite -- MATH 140 with a minimum grade of 'C' or Placement Test -- or Consent of Chair --

#### **Course Objectives:**

- 1. Understand the concepts of a limit, continuity, and differentiability.
- 2. Differentiate algebraic, exponential, and logarithmic functions.
- 3. Apply the sum, product, quotient, and chain rules of differentiation.
- 4. Understand the concept of an antiderivative and its role in the Fundamental Theorem of Calculus.
- 5. Apply various integration techniques and numerically estimate definite integrals.
- 6. Apply the concepts of differential and integral calculus to business and social science scenarios.

#### Student Learning Outcomes:

Upon satisfactory completion of the course, students will be able to:

- A. Estimate limits and derivatives graphically and by using tables of values.
- B. Calculate limits of functions algebraically.
- C. Calculate derivatives of functions using the definition of a derivative.
- D. Calculate derivatives of functions using the sum, product, quotient and chain rules.
- E. Determine the equation of a tangent line to the graph of a function.
- F. Determine local and absolute extrema for functions in one variable.
- G. Apply derivatives to problems involving optimization.
- H. Determine antiderivatives of functions.
- I. Evaluate definite integrals by using the Fundamental Theorem of Calculus.
- J. Calculate integrals using substitution, integration by parts methods, and integration tables.
- K. Calculate partial derivatives of a function in two variables.
- L. Determine local extrema for functions in two variables.

#### **Topical Outline:** Week Topics 1-2 **Review Exponential and Logarithmic Functions** 3-4 Continuity 5 - 7 Tangent Lines Derivatives Sum, Product & Quotient Rules 8 - 9 First & Second Derivative Tests **Optimization Problems** 10 - 11 Antiderivatives **Definite Integrals** Fundamental Theorem of Calculus 12 - 13 Substitution Integration by Parts Integration Tables 14 - 15 Partial Derivatives Extreme Values for Functions in Two Variables 16 Final Exam

## Calendar:

# Methods of Evaluation:

Total Percentage: 0%

The weight given to exams, quizzes, and other instruments used for evaluation will be determined by the instructor.

### Methods of Assessment:

Exams, quizzes, homework, in-class activities and other assessments will be used as appropriate to assess student learning.

### Methods of Instruction:

Problem-based activities, collaborative-learning techniques, and lecture will be used as appropriate.

#### **Recommended Text:**

- Hoffman, L. D., and Bradley, G. L. Applied Calculus for Business, Economics, and the Social and Life Sciences 9 Edition, McGraw-Hill Science/Engineering/Math, 2007 ISBN: 0073309265
- Barnett, R. A., Ziegler, M. R., & Byleen, K. E. Calculus for Business, Economics, Life Sciences & Social Sciences 11th Edition, Prentice Hall, 2007 ISBN: 0132328186