AUC-NUC

MA 149-1 Introductory Calculus
Winter, 2007
Instructor: Dr. Henry Leung

Contacting the Instructor

Class Times:	Tue 6:30 – 9:30 pm	**Class Location: 643**
	LAB: Thur 4:15 – 5:30 pm	**643**
Phone:	220-4875	**Office: TBD**
Email Address:	leungh@ucalgary.ca	

Course Description

Algebraic & trigonometric expressions and operations; properties and graphs of functions; limits and continuity: derivative techniques of differentiation; transcendental (trigonometry logarithmic and exponential) functions; integrals and the fundamental theorem of calculus; applications.

Pre-requisite: A grade of 70 % or higher in Math 20 or equivalent.

Recommended Text

Anton H., Bivens I., Davis S., *Calculus*, Brief Edition, Eighth edition, John Wiley & Sons.

Topics to be covered

- Real numbers, intervals, and inequalities; Absolute value; Coordinate planes, lines and linear functions; Distance, circles, and quadratic functions (Appendix d, e, f, g)
- Functions (Chapter 1)
  - Functions
  - New Functions from Old
  - Families of Functions
  - Inverse Functions; Inverse Trigonometric Functions
  - Exponential and Logarithmic Functions
- Limits and Continuity (Chapter 2)
  - Limits
  - Computing Limits
  - Continuity
  - Continuity of Trigonometric and Inverse Functions
- The Derivative (Chapter 3)
  - Tangent Lines, Velocity, and General Rate of Changes
  - The Derivative Function
  - Techniques of Differentiation
  - The Product and Quotient Rules
  - Derivatives of Trigonometric Functions
  - The Chain Rule

  - Related Rates
- Derivatives of Logarithmic, Exponential, and Inverse Trigonometric Functions (Chapter 4)
  - Implicit Differentiation
  - Derivatives of Logarithmic Functions
  - Derivatives of Exponential and Inverse Trigonometric Functions
  - L'Hôpital's Rule; Indeterminate Forms
- The Derivative in Graphing and Applications (Chapter 5)
  - Analysis of Functions I: Increase, Decrease, and Concavity
  - Analysis of Functions II: Relative Extrema; Graphing Polynomials
  - Absolute Maxima and Minima
  - Applied Maximum and Minimum Problems
- Integration (Chapter 6)
  - An Overview of the Area Problem
  - The Indefinite Integral
  - Integration by Substitution
  - The Definition of Area as a Limit; Sigma Notation
  - The Definite Integral
  - The Fundamental Theorem of Calculus
  - Evaluating Definite Integrals by Substitution

Course Requirements and Grading

There will be five quizzes, each 30 minutes or less in duration, administered during the lab. There will be a midterm test and a final examination. The final exam will be scheduled by the Registrar's Office.

Following weights will be used to determine the final grade in the course.

Quizzes (best 4 of 5)	40%
Midterm Test	20%
Final Exam	40%