

LINGNAN UNIVERSITY
SSC 114 Calculus
Spring 2008

Instructor: Dr. Hsiang-Chih Hwang

Class Meeting Time and Place: SO105 Monday 11:30 - 13:30

Tutorial: SO105 Tuesday 17:30 – 18:30

Office Hours: SO301, Monday and Thursday 13:30 -14:30 or by appointment.

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This course is designed to provide a working knowledge of the analytical tools of calculus in social science analysis. Calculus is the study of change and therefore the study of two basic questions:

1. Given a quantity that is changing, what is the rate of change?
2. Given the rate of change of a quantity as it changes, what is the net change?

Hence, in this course we will first focus on studying the basic concept of calculus—the limit, the derivative, and the integral—which provides answers to the above two questions. Additionally, we will also cover unconstrained and constrained optimization as well as some business and economics applications. We will conclude the course by applying the techniques to analyze and interpret business and economic relationships in a sophisticated way.

Textbooks and Readings

James Stewart, *Calculus*, sixth edition (Thomson, 2008) [S]

Alpha Chiang and Kevin Wainwright, *Fundamental Methods of Mathematical Economics*, fourth edition (McGraw-Hill, 2005) [CW]

Knut Sydsaeter, Arne Strom, Peter Berk, *Economists' Mathematical Manual*, fourth edition (Springer, 2005). The electronic version of this book is available through the Lingnan Library (<http://www.library.ln.edu.hk>).

Other required readings will be accessible on the internet or distributed in class.

Course Requirements and Grading Policy

Assessment of the course includes participation in lectures and tutorials, the completion of course assignments, quizzes, one midterm, and a final exam. The quizzes and exams will be closed book, closed note. Below is detailed information for assessment of the course:

1. Assignments and class participation (15% of the grade)— I expect that you will have read the assigned textbook material before coming to lecture. There will be a number of weekly assignments. You are required to turn in all of these exercises. You must do these exercises on your own. ***Assignments will be due in class. NO late assignments will be accepted.***

All homework assignments will be graded and recorded. Late assignments lose 30% of their grades per day. Note that assignments are late whenever submitted later than 14:30 on the due date. Late homework must be handed directly to me. DO NOT submit homework in the form of e-mail attachments.

2. Quizzes (15% of the grade)—There will be two quizzes for this course. The purpose of the quizzes is to keep you on track with the course. Quiz questions will be based on lecture notes and assignments.
3. Midterm exam (30% of the grade)—There will be one in-class midterm exams on **October 20th**.
4. Final exam (40% of the grade)—to be held during the final exam period. The exam will be based on the textbooks, lecture notes, assigned readings, problem sets, and quizzes.

Note: graphical calculators are not allowed in the exams.

WebCT

Some course materials will be posted on course conference for your convenience.

TENTATIVE COURSE OUTLINE

Date	Topics and assigned readings
01-09-2008	<i>Introduction and pre-calculus.</i> Overview of the course. Introduction to the notion of sets and functions. Read: S Ch1; CW Ch2
08-09-2008	<i>The differentiation of functions of one variable.</i> The gradients of non-linear functions, the derivative of a function, general rules of differentiation, higher-order derivatives Read: S Ch2 & Ch3; CW Ch6 & Ch7
15-09-2008	<i>The day following the Mid-Autumn Festival</i>
22-09-2008	<i>The differentiation of functions of one variable.</i> Continued. Assignment 1 due.
29-09-2008	<i>Exponential and logarithmic functions.</i> Exponential and logarithmic functions. The differentiation of exponential and logarithmic functions. Read: S Ch 7; CW Ch10.
6-10-2008	<i>Differentiation of functions of more than one variable.</i> Functions of more than one variable. Partial differentiation. Higher order partial derivatives. Total derivatives and implicit differentiation. Read: S Ch15; CW Ch11 Quiz 1 Assignment 2 due

- 13-10-2008** *Differentiation of functions of more than one variable. Continued*
Review for midterm exam.
- 20-10-2008** *Midterm Examination*
- 27-10-2008** *Return exam and go over solutions.*

Unconstrained and constrained optimization. The unconstrained optimization of functions of more than one variable. Constrained optimization.

Read: S Ch 15; CW Ch 8 & Ch11
- 03-11-2008** *Calculus in Economics. Utility maximization. Profit-maximization and cost minimization. Comparative-static analysis in general function models.*

Read: S Ch4 & Ch15; CW Ch 8

Assignment 3 due.
- 10-11-2008** *Calculus in Economics. Continued.*

Quiz 2
- 17-11-2008** *Techniques of integration. Indefinite integral. Integration by parts. Integration by substitution. Applications to Economics.*

Read: S Ch5, Ch8 & Ch9; CW Ch14
- 24-11-2008** *Techniques of integration. Continued.*

Assignment 4 due
- 1-12-2008** *Catch up the schedule and Review for Final Exam.*