

**ECON 4838-003**  
**MICROCOMPUTER APPLICATIONS IN ECONOMICS**  
Spring 2009

CLASSROOM LOCATION: HUMN 1B45

CLASS DAYS/TIME: TR 11:00-12:15

INSTRUCTOR: Professor Frank S. T. Hsiao

OFFICE: Economics Building 107 (shared with Prof. Keith Maskus during my office hours only. Any written message, including HW, should be given to the Department Office (EB212) upstairs to put it in my mailbox).

OFFICE HOURS: TR 12:20-1:20, or by appointment.

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HOMEWORK WEB SITE AND CLASS ANNOUNCEMENTS:

[www.colorado.edu/Economics/courses/hsiao/index.HTM](http://www.colorado.edu/Economics/courses/hsiao/index.HTM)

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**OBJECTS:** The main object of this course is innovative uses of the personal computer in economic analysis and in model building techniques. Students will acquaint themselves with the nature and properties of economic models by trial and error through individualized, computer generated exercises. The course contents are divided into five parts:

- Part I Excel and basic economic and business analysis,
- Part II Basic statistics
- Part III Private and public decision making
- Part IV. Optimization
- Part V. Large data basis and presentation
- Part VI. Dynamics and Comparative Dynamic analysis.

Different skills in using Excel will be introduced gradually while we review/learn basic Economics, Mathematics, and Statistics. The exact contents and emphasis of the course may differ from year to year depending on the interest of the students and the instructor. In previous years, Part VI covered Input-output Analysis, Linear Programming, or Game Theory.

**TEXTBOOKS:**

Hsiao, F., *Economic and Business Analysis-Quantitative Methods with Spreadsheets*, 2008 (required). The Lecture Notes are available from the CU Bookstore.

**References for Windows Excel 2007:** Any *Microsoft Excel for Windows* books available in the bookstores, university libraries, or public libraries.

Mizrahi, Abe, and M. Sullivan. *Mathematics for Business and Social Sciences, An Applied Approach*, 4th ed., John Wiley and Sons.

This book is generally used in Math 1050-1 to Math 1100-1. The equivalent level of the book is used in Econ 1078-3 and 1088-3.

Previous knowledge of microcomputers or software is not required. However, students should have enough time to practice and familiarize themselves with the computer and the software package program in a short period of time. This takes constant effort and great determination.

**THE SOFTWARE PROGRAM:** The software program we use is Microsoft Excel 2007 for Windows. It is installed on the hard disk of the computers in the classroom.

The reason we use Excel is simple. It is practical and widely available. We have been using many different spreadsheets programs in this class since 1986: VisiCalc, Lotus 1-2-3, Quattro Pro, and now Excel, depending on the most popular spreadsheet program of the time. As shown in the reference section below, we have demonstrated that the spreadsheet program is an excellent tool for computer assisted instruction (CAI) in economics and statistics (see the last section of this syllabus). Unlike a packaged learning program, students can learn economic, statistical, and mathematical concepts and methods by actually writing the formulas directly on spreadsheets. However, no knowledge and skill of programming languages, like BASICS, FORTRAN, C+, C++, etc., are required.

On the other hand, many students find that the spreadsheet program is easy to learn and use, as compared with software packages like TSP, RATS, SAS, SPSS, the commands of which are oftentimes confusing, idiosyncratic, and easy to forget. They also find that Excel is useful in daily life (balancing the budget, doing financial planning, etc.) for personal decision making, and helps them easier to get a job in business and government (Excel is required in business schools).

**FACILITIES:** The computers we use are Dell computers, Microsoft Windows Office 2007 with Microsoft Windows XP Professional Operation System, which is similar for Mac based computer. The class will be held in the new Humanities Building, Room 1B45. There are 22 Dell microcomputers in the room, each with a 24" wide-screen color graphic monitor. Software programs are installed on the hard disk drive.

Microsoft Excel is also installed in the microcomputers located in the Economics Building Room 7 and Engineering Center. They are also available in Business School Library, Norlin Library Rooms 310 and M350. There are about 30 computing sites throughout the campus. The Excel program is installed in most of the sites. When they are not in use by classes, the facilities are available for individuals.

Reference books and periodicals on Excel (and other spreadsheet programs) are available at the Math/Physics Library, the Business Library, and the Boulder Public Library. There are only a few changes in Excel commands since Excel 98 was published, although the appearance of the latest Excel 2007 is quite different from the previous versions. Reference books for other versions of Excel may also be useful.

## COURSE SCHEDULE

Week	Week of	Chapter	Topic
<b>I. Excel and Basic Economic and Business Analysis</b>			
1	13-Jan	1	Excel Worksheets
2	20-Jan	2	Total Revenue, Total Cost, and Profits – Excel Tables
3	27-Jan	3	Static Analysis in Economics and Business: Excel Graphics
4, 5	10-Feb	4	Comparative Static Analysis: -Name that Range!
<b>II. Basic Statistics</b>			
6	17-Feb	5	Some Useful Statistic Functions – Equations and Formulas
<b>2/19 (R) First Mid-term Exam - 20%</b>			
7	24-Feb	6	Random Numbers and Frequency distributions –Large Datasets
8	3-Mar	7	Regression Analysis – Excel Commands
<b>III. Private and Public Decision Making</b>			
9	10-Mar		



### **SOME REFERENCES:**

Hsiao, F.S.T. "Matrices, Regression, and Linear Programming on Spreadsheets," *Bulletin of Information Processing Center*, Otaru University of Commerce, Japan, Vol. 2, January 1991, pp. 123-141.

----- "The Simplex Method of Linear Programming on Microcomputer Spreadsheets," *College Mathematics Journal*, A publication of the Mathematical Association of American, Vol. 20, No. 2, March 1989, pp. 153-160.

----- "Implementation of the Gauss-Jordan Method of Matrix Inversion by Spreadsheet Macros," *International Journal of Mathematical Education in Science and Technology*, Vol. 19, No. 5, September/October 1988, 729-737.

----- "An Evaluation of Spreadsheet Macros for CAI—with Applications to Matrix Multiplication," *Collegiate Microcomputer*, Vol. 5, No. 4, Winter 1987, pp. 333-342.

----- "A Computational Design of Some Matrix Iterative Method Using Spreadsheets," *Industrial Engineering*, Vol. 9, No. 5, May 1987, pp. 17-26.

----- "The Gauss Quadrature Numerical Integration—A Comparison of the Programming Method and the Spreadsheet Method,"

attendance.

Any student eligible for and needing academic adjustments or accommodations because of disability or religious practice should arrange to meet with the instructor immediately. Those with disabilities should immediately submit a letter from Disability Services describing appropriate adjustments or accommodations.

Students and faculty share responsibility for maintaining an appropriate learning