Economics 363C
Statistics and Scientific Computation 339
Computational Economics
Fall 2013

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BRB 3.134E   MW 1 pm, F 11 am
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http://www.utexas.edu/cola/depts/economics/faculty/dak2

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This course provides an introduction to computational economics for undergraduates. It will cover the application of computational methods to economic models in fields such as sectoral economics, environmental economics, macroeconomics, financial economics, growth theory and others. The computational methods will include both simulation and optimization approaches as well as databases. A variety of computer languages will be used including MATLAB, GAMS and Mathematica.

Previous knowledge in economics, mathematics and computational methods is useful though strength in one or two of these areas can more than accommodate for little or no background in one or two of the others.

There are weekly computer exercises as well as a term paper.

Text

David A. Kendrick, P. Ruben Mercado and Hans M. Amman, *Computational Economics,* Princeton University Press, Princeton, NJ, 2006. (KMA)

Web Sites

The web site containing the input files that are used for most of the experiments as well as pointers to web sites for the applications used in the course is

       http://www.laits.utexas.edu/compeco/

In addition, the TA for the class will maintain a web site for the course which is at

       http://www.laits.utexas.edu/compeco/Courses/index363.html

Outline

Part I Once Over Lightly …

Part II   Once More …

Schedule

Aug	30	Lecture
		Introduction to Growth Models: Verbal and Mathematical

Sept   2   Labor Day

Sept   4   Lecture
                 Growth in Excel – Ch. 1 in KMA

Sept   6   Lab
                 Excel – Modify and solve the growth model.

Sept   9   Lecture
                 Transportation in GAMS – Ch. 4 in KMA
            Lab
                 Transportation in GAMS
            Due
                 Experiment on the growth model in Excel

Sept   16   Lecture
                 Database in Access – Ch. 5 in KMA
                 Partial Equilibrium in Mathematica – Ch. 3 in KMA
            Lab
                 Database in Access
                 Partial Equilibrium in Mathematica
            Due
                 Experiment on transportation in GAMS

Sept   23   Lecture
                 Thrift in GAMS – Ch. 6 in KMA
            Lab
                 Thrift in GAMS
            Due
                 Experiment on database in Access or partial equilibrium in Mathematica

Sept   30   Lecture
                 Portfolio in MATLAB – Ch. 7 in KMA
            Lab
                 Portfolio in MATLAB
            Due
                 Experiment on thrift in GAMS

Oct   7   Lecture
              General Equilibrium Models in GAMS – Ch. 8 in KMA
              Lab
              General Equilibrium Model in GAMS
              Due
              Experiment on portfolio in MATLAB

Oct   14   Lecture
              Agent-Based Model in MATLAB – KMA 14
              Lab
              Agent-based model in MATLAB
              Due (Oct 18)
              Short Paper

Oct   21   Lecture
              Big Data – Python – Tom Roderick
              Lab
              Big Data - Python
              Due
              General equilibrium model in GAMS
              or agent based model in MATLAB

Oct   28   Lecture
              Macroeconomics in GAMS – Ch. 13 in KMA
              Lab
              Macroeconomics in GAMS
              Due
              Experiment on big data with Python

Nov   4   Lecture
              Genetic Algorithms and Evolutionary Games in MATLAB – Ch. 11 in KMA
              Lab
              Genetic Algorithms and Evolutionary Games in MATLAB
              Due
              Experiment on Macroeconomics in GAMS

Nov   11   Lecture
              Global Warming in GAMS – KMA Ch. 15
              Lab
              Global Warming in GAMS
              Due (Nov 15)
              Progress Report on Long Paper

Nov   18   Lecture
                  Genetic Algorithms and Portfolio Models in MATLAB – Ch. 12 in KMA
              Lab
                  Genetic algorithms and portfolio model in MATLAB
              Due
                  Experiment on genetic algorithms and evolutionary games in MATLAB
                  or on global warming

Nov   25   Lecture
                  First lecture on Neural Nets – Ch. 2 in KMA

              Week of Thanksgiving Holiday

Dec   2   Lecture
Mon   Second Lecture on Neural Nets in Excel – Ch. 2 in KMA

Dec   4   Lab
Wed   Neural Nets in Excel
            While in lab do an experiment on neural nets, and write up a couple
            of paragraphs and turn it in before leaving the lab.

Dec   6   Long Paper -   Turn in at 4th floor lab by 1 pm
Friday   Reminder – No late papers! – Loss of letter grade per nanosecond late!

This course carries the Quantitative Reasoning flag. Quantitative Reasoning courses are designed to equip you with skills that are necessary for understanding the types of quantitative arguments you will regularly encounter in your adult and professional life. You should therefore expect a substantial portion of your grade to come from your use of quantitative skills to analyze real-world problems.

Since there are a considerable number of weekly exercises (experiments) you can claim a "skip" on one of them during the semester by turning in that week a sheet with only your name, the experiment name and the word "skip" on it.   If you do not use the skip then the last exercise will be entered as skipped on the grade spreadsheet.

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Grades

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1. Short Paper	25	Oct 18
2. Experiments	40	
3. Progress Report on Long Paper	5	Nov 15
4. Term Paper	<u>30</u>	Dec 6
Total	100	

This class is like a job. You can miss a day's work here and there with no problem; however, more than that has consequences.   More than four unexcused absences in the semester will results in a loss of one point on the final course grade for each additional unexcused absence.

I will make myself available to discuss appropriate academic accommodations that you may require as a student with a disability. Also students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 471-6259,
> http://www.utexas.edu/diversity/ddce/ssd/

See the UT Honor Code at:
> http://registrar.utexas.edu/catalogs/gi09-10/ch01/index.html

By UT Austin policy, you must notify me of your pending absence at least fourteen days prior to the date of observance of a religious holy day. If you must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence.