**Macroeconomics II – Econ 973**

**University of New Hampshire**

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The goal of the course is to familiarize students with the use of dynamic, macroeconomic models with uncertainty. We will start by reviewing basic models with no uncertainty, to build tools and intuition. Later, we will study dynamic problems under uncertainty, with strong use of dynamic programming techniques. We will go through models of representative agents and representative firms first, reviewing basic search literature. Towards the end, we will study more complex environments with incomplete markets and multiple agents and firms. Complementing the theory, the student will learn to use Matlab, a programming language. Many homework assignments will be based on the use of Matlab. To this end, we will base our course on discrete time models, since these are easier to adapt to computational needs.

This course is self-contained. That is, all you need is the class notes. Nevertheless, there are textbooks, papers, and my own set of class notes that you can use to clear doubts or expand your learning beyond the requirements of this course.

**Evaluation**

Surprise quizzes: 5%

Homeworks: 30%

In Class Presentations: 10%

Mid Term Exam: 25%

Final Exam (take-home): 30%

**Homeworks**

There will be regular homeworks, that will include both Matlab based problems and theory based problems. For the Matlab related problems, I will ask you to turn in the code via email, and I will run it in my computer to verify that everything works. If there are more than one code being performed, put them all within a folder and submit the entire folder. For the theory part, on the days in which you need to turn in the homework, I will call you by lottery to solve them on the board. A different student will solve each exercise. The evaluation will be based on both the pages you turn in and your performance on the board.

**In Class Presentations**

You will need to present a paper of your choosing in Macroeconomics. I need to approve the paper you choose. The idea is twofold: (i) that you jump into the paper to understand it inside out; and (ii) that you start acquiring presentation skills, which are essential to every economist. We will set up a class in which each of you will give a twenty-minute talk.

**Books and Class Notes**

There are personal class notes made by me that follow the classes very closely. In addition, the following textbooks can complement these notes:

1. Recursive Methods in Economic Dynamics (“SLP”), by Nancy Stokey and Robert Lucas, Jr., with Edward C. Prescott, Harvard University Press (1989).
2. Recursive Macroeconomic Theory (“LS”), by Lars Ljunqvist and Thomas Sargent, MIT Press (2004).
3. Economic Growth (“BS”), by Robert Barro and Xavier Sala-i-Martin, MIT Press (2004).
4. Economic Dynamics in Discrete Time (“M”), by Jianjun Miao, MIT Press (2014).

Additionally, two unpublished books by Dirk Krueger can be useful, that I can provide on demand. These are

* Consumption and Saving: Theory and Evidence (“K1”)
* Macroeconomic Theory (“K2”)

**Tentative Program**

1. Dynamic Programming Under Uncertainty (4 lectures)
   1. Bellman Equations
   2. Blackwell’s Sufficient Conditions
   3. Benveniste Scheinkman Theorem
   4. Applications

References:

* K2, Chapters 3 and 4
* SLP, Chapter
* LS, Chapters 3 and 4
* M, Chapter 18

1. Search Models (4 lectures)
   1. Simple Search Models
   2. The Intuition Behind Bellman Equations
   3. Extensions
   4. Matlab

References:

* LS, Chapter 6
* M, Chapter 18

1. Models with heterogeneity (8 lectures)
   1. Incomplete Markets
   2. Heterogeneous Agents
   3. Heterogeneous Firms
   4. The firm size distribution and Zipf’s law
   5. Application: income inequality
   6. Application: firing costs
   7. Application: international trade
   8. Application: resource misallocation

References:

* Aiyagari, S. “Uninsured Idiosyncratic Risk and Aggregate Saving”, The Quarterly Journal of Economics, Vol. 19, No. 3, 1994.
* Hopenhayn, Hugo A, 1992. "[Entry, Exit, and Firm Dynamics in Long Run Equilibrium](https://ideas.repec.org/a/ecm/emetrp/v60y1992i5p1127-50.html)," [Econometrica](https://ideas.repec.org/s/ecm/emetrp.html), Econometric Society, vol. 60(5), pages 1127-50, September.
* Hopenhayn, Hugo & Rogerson, Richard, 1993. "[Job Turnover and Policy Evaluation: A General Equilibrium Analysis](https://ideas.repec.org/a/ucp/jpolec/v101y1993i5p915-38.html)," [Journal of Political Economy](https://ideas.repec.org/s/ucp/jpolec.html), University of Chicago Press, vol. 101(5), pages 915-38, October.
* Melitz, Marc, "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity," Econometrica, Econometric Society, vol. 71(6), pages 1695-1725, November.
* M, chapter 17

1. Indivisible Labor (2 lectures)
   1. Complete and Incomplete Markets
   2. Labor Lotteries

References:

* Rogerson, Richard, 1988. "[Indivisible labor, lotteries and equilibrium](https://ideas.repec.org/a/eee/moneco/v21y1988i1p3-16.html)," [Journal of Monetary Economics](https://ideas.repec.org/s/eee/moneco.html), Elsevier, vol. 21(1), pages 3-16, January.
* Hansen, Gary D., 1985. "[Indivisible labor and the business cycle](https://ideas.repec.org/a/eee/moneco/v16y1985i3p309-327.html)," [Journal of Monetary Economics](https://ideas.repec.org/s/eee/moneco.html), Elsevier, vol. 16(3), pages 309-327, November.

1. Overlapping Generations (1 lecture)
   1. An endowment economy
   2. A production economy
   3. Efficiency of the equilibrium