Course Overview:

This course is the second in a two-part PhD macroeconomics sequence. Today, macroeconomists have turned to fully specified equilibrium models to understand the economy. Modern macroeconomic models have “microeconomic foundations” and are usually explicitly dynamic. We will cover several of the basic macroeconomic models that economists use to understand consumption, investment and business cycles. We will emphasize not only theory but also the empirical success of these models. In addition, the students will be familiarized with several basic tools used in modern macroeconomic analysis.

Lecture: MW 2:30-4:00, Lorch 173

Discussion: M 5:30-7:00, Lorch 173

Teaching Fellow: Claudia Sahm

Office Hours: Tuesday and Thursday 9:00 – 10:00 (phone: 764-2364)

Prerequisites:
Open to all PhD students in economics. Others may attend with the permission of the instructor.

Course Requirements and Grading:

The teaching fellow will hold weekly discussion and review sessions. Problem sets will be assigned regularly. Students may discuss the problems among themselves as long as they make a serious individual effort before hand.

There will be a midterm exam (40%) and a final (60%). Homeworks and class participation will be taken into account in borderline cases. Problem sets will be graded *very* loosely (check, check plus, check minus, zero). I will not expect the teaching fellow to provide extensive comments on the problem sets. (The TF will basically just make sure you did it). If you need additional motivation to do your homework at this point, you shouldn’t be in a PhD program.

Some of the problem sets will require you to do some work on the computer. The programming language I use is MATLAB. Although you are allowed to use any language you like (GAUSS, FORTRAN90, C++, etc.) I will give you assistance with MATLAB code only.
Readings:

Core readings are marked with an asterix (*) while other readings are listed for a more in depth treatment. You should carefully read the core material. Students with a strong interest in macroeconomics are encouraged to familiarize themselves with the additional articles.

I assume that you are familiar with basic undergraduate macroeconomics (at the level of say Mankiw’s intermediate text; also see the undergraduate texts offered by Barro, and by Auerbach and Kotlikoff).

The following texts have been ordered and are available at Ulrich’s bookstore:

**Required:**

There is one required text and a notes packet available at Ulrichs.

The required text is:

**Romer, David, Advanced Macroeconomics, McGraw-Hill 1996**

Additional References (optional)

**Sargent, Thomas and Lars Ljungqvist, Recursive Macroeconomic Theory, MIT Press 2000**
**Farmer, Roger, The Macroeconomics of Self-Fulfilling Prophecies, MIT Press, 1993.**
**Blanchard and Fischer, Lectures on Macroeconomics, MIT Press, 1989.**

The only text you are required to have is the Romer text. The others are excellent texts but any specific required readings from them will be provided to you.

If you are a serious macro student, the following texts are also very useful.

**Barro, Robert and Xavier Sala-i-Martin, Economic Growth, McGraw-Hill 1995.**
**Barro, Robert, Modern Business Cycle Theory, Harvard University Press.**
**Dixit and Pindyke, Investment Under Uncertainty, Princeton University Press 1994**
**Hamilton, James, Time Series Analysis, Princeton University Press 1994.**
**Lucas, Robert, Understanding Business Cycles, MIT Press 1983.**
**Sargent, Thomas, Dynamic Macroeconomic Theory, Harvard University Press 1987.**
**Sargent, Thomas, Macroeconomic Theory, Academic Press 1987.**
**Stokey, Nancy, Robert Lucas and Ed Prescott, Recursive Methods in Economic Dynamics, Harvard University Press 1987.**

Many of the assigned readings are available online (via the Graduate Library’s Resources or the NBER working papers for instance). In addition, I may, at times, provide handouts in class.
Course Outline

Introduction


Dynamic Optimization

I. Control Methods

   a. The Kuhn-Tucker Theorem

      (review) Simon and Blume, *Mathematics for Economists*, Chapters 18 & 19

   b. Hamiltonians

   c. Preview: A Pure Exchange Economy

      1.) The Fisher Equation.
      2.) The No-Ponzi Condition
      3.) The Transversality Condition.
      4.) Consumption smoothing?

II. Dynamic Programming

   a. Theory

      * Sargent and Ljungqvist, Chapter 2.

      Sargent, Thomas, (1987) *Dynamic Macroeconomics*, Chapter 1

      Stokey, Lucas and Prescott (1987) Sections: 3.2, 3.3, 4.1, 4.5, 9.1, 9.5,

   b. Practice.

      * Sargent and Ljungqvist, Chapter 3.

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1 This list of topics is not set in stone. If it becomes apparent that I am falling behind, I may remove certain topics.
“Partial Equilibrium” Applications

I. Consumption Theory

a. Life-Cycle / Permanent Income Hypothesis Under Rational Expectations

* Romer 7.1-7.4


b. Precautionary Saving and Liquidity Constraints

* Romer 7.6


c. Asset Pricing

i.) The Consumption CAPM

* Romer 7.5

Sargent and Ljungqvist, Chapter 10.

Blanchard and Fischer 10.1


ii.) The Term Structure of Interest Rates

* Romer 9.3

II. Optimal Search

* Sargent and Ljungqvist, Chapter 5.

III. Investment.

a. The Basic Neoclassical Model – Convex Adjustment Costs

* Romer 8.1-8.5


b. Non-Convex Adjustment Costs

* Romer 8.6
* Abel and Eberly. “A Unified Model of Investment Under Uncertainty” AER 1994

c. Empirical Success

Cash Flow Sensitivity

Fazzari Hubbard & Peterson, “Financing Constraints & Corporate Investment,” BPEA 1988

Equilibrium Applications

I. RBC Models.

a. Stylized Facts

* Romer 5.6

Detrending


Facts


Abraham and Haltiwanger “Real Wages and the Business cycle” JEL (33) 1995

b. The Basic RBC Model

* Romer 4.2-4.7


Solution Methods:


Evaluations/Interpretation:


* Prescott. (1986) “Response to a Skeptic” Federal Reserve Bank of Minneapolis *Quarterly Review*. (Fall)


c. Extensions and Propagation Mechanisms


Indivisible Labor


Capital Adjustment Costs.

* Romer 8

Variable Utilization


II. Aside: Government Spending and Taxation

a. Spending Shocks and Crowding Out

* Romer 2.7


b. Taxation and Finance

Ricardian Equivalence

* Romer 2.8

Optimal Taxation

Sargent and Ljungqvist, Chapter 12.


III. Complementarities, Multiple Equilibria and Sunspots

* Romer 6.14

* Cooper and John, “Coordinating Coordination Failures in Keynesian Models” *Quarterly Journal of Economics* 103 (August), in Mankiw and Romer (1991)


IV. Heterogeneity in Macroeconomics

a. Problems for analysis (time permitting)

Not so serious: Linear problems


Much more serious: Non-linear problems / Curse of Dimensionality


b. Aggregate implications of macroeconomic heterogeneity


Caballero, Engle and Haltiwanger, “Plant-Level Adjustment and Aggregate Investment Dynamics”. *BPEA* (1995:2) (see comments as well)


V. Money

a. Basic Issues

* Sargent and Ljungqvist Ch 17.

* Romer 6 (all) & 5.6


b. Sticky Price Models


VI. Market Imperfections and Macroeconomics (time permitting)

a. Credit Market Imperfections

Credit Rationing


Costly State Verification


Financial Accelerator


b. Labor market Imperfections

Efficiency Wages

Other useful Stuff:

- **QMRC web page** http://ideas.uqam.ca/QMRBC/
  This is Christian Zimmerman’s quantitative macro and RBC page it has lots of good stuff.

- **“FRED”** http://www.stls.frb.org/fred/
  The St. Louis Federal Reserve data site. It has a lot of data that can be downloaded free.

- **Federal Reserve Bank of Minneapolis Quarterly Review.**
  This is a good source for good recent research in macro. You can sign up for their mailing list free at [http://research.mpls.frb.fed.us/research/qr/qrinfo.html](http://research.mpls.frb.fed.us/research/qr/qrinfo.html)