

Econ 210
Macroeconomics I
Fall 2003
TTh 9:00 - 10:50 Landau 140

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Macroeconomics I

This course is the first in a three-course sequence on macroeconomics. As the first course in the sequence, there will be an emphasis on technical as well as substantive issues. On the technical side, the course will deal with the analysis of simple dynamic general equilibrium models in both continuous and discrete time and in both deterministic and stochastic environments. Considerable time will be spent on classical and recursive methods for solving such models, as well as an introduction to numerical methods for solving these models using a programming language such as MATLAB. On the substantive side, these techniques will be applied to studies of issues in growth and development, business cycles, income inequality and the effects of fiscal policy.

There is no textbook for this course. However, the following books provide an alternative (and very good) treatment of some of the topics.

Ljungqvist, Lars and Thomas J. Sargent (2001), *Recursive Macroeconomic Theory*, MIT Press (Henceforth LS).

Romer, David. (2001) *Advanced Macroeconomics*. 2nd Edition. New York: McGraw Hill.

Stokey, Nancy and Robert E. Lucas Jr., with Edward C. Prescott (1989), *Recursive Methods in Economic Dynamics*, Harvard University Press (Henceforth SLP).

Irigoyen, Claudio, Esteban Rossi-Hansberg and Mark L. J. Wright (2003), *Solutions Manual for Recursive Methods in Economic Dynamics*, Harvard University Press.

Copies of these books have been ordered at the bookstore. The attached reading list collects a number of other useful references to which you may wish to refer. The most important are marked with an asterisk. Class handouts, some lecture notes, and general course information are available on the class website on Coursework.

Course grades will be a weighted average of grades on several problem sets (25%), the midterm (30%), and the final exam (45%). Students are encouraged to collaborate on the problem sets, but must turn in individually written-up results (with a list of collaborators on the front page). Prakash Kannan (pkannan@stanford.edu) will be the teaching assistant and will hold a recitation session on Fridays from 1:15 to 3:05 pm.

Office hours will be held in Landau 336 on Tuesdays between 1 and 3 pm.

Course Outline

1. Growth and Development

Growth and development facts. The descriptive growth model of Swan and Solow. The optimal and equilibrium growth model of Ramsey, Cass and Koopmans. Endogenous growth models. Review of dynamical systems. Introduction to deterministic dynamic optimization in continuous and discrete time by classical and recursive methods: the Maximum Principle; Dynamic Programming. Some simple numerical methods: discrete state space value function iteration; (log) linear approximation.

2. Business Cycles

The costs of business cycles. Real Business Cycle models. Competitive equilibria in infinite dimensional spaces. Recursive competitive equilibrium. Stochastic dynamic programming.

3. Inequality: Bewley Models of Incomplete Markets

Aggregation. Income, wealth and consumption inequality. Uninsurable idiosyncratic risk and the risk free rate. Revisiting the costs of business cycles.

4. The Positive Economics of Fiscal Policy

Fiscal policy in an RBC model. The effects of flat rate taxation. Ricardian equivalence. Overlapping generations models.

Reading List

1 Growth and Development (3 weeks)

1.1 Growth and Development Facts

1. McGrattan, E. R. and J. A. Schmitz, Jr. (1998). Explaining Cross-Country Income Differences. *Handbook of Macroeconomics*. J. B. Taylor and M. Woodford. Amsterdam, Elsevier.

1.2 The Solow-Swan Growth Model

1. * Romer Chapter 1.
2. Solow, Robert M. "A Contribution to the Theory of Growth." *Quarterly Journal of Economics* 70 (1956): 65-94.
3. Swan, Trevor W. "Economic Growth and Capital Accumulation." *Economic Record* (1956): 334-61.

1.3 The Optimal Growth Model of Ramsey-Cass-Koopmans

1. * Romer Chapter 2, Part A.
2. * SLP Chapters 2 and 4.5.
3. Cass, David. "Optimum Growth in an Aggregative Model of Capital Accumulation." *Review of Economic Studies* 32 (1965): 233-40.

1.4 Endogenous Growth Models

1. * LS Chapter 11.
2. * Romer Chapter 3.
3. * Lucas, Robert E., Jr. "On the Mechanics of Economic Development." *Journal of Monetary Economics* 22, no. 1 (1988): 3-42.
4. Rebelo, Sergio. "Long-Run Policy Analysis and Long-Run Growth." *Journal of Political Economy* 99 (1991): 500-21.
5. Jones, Larry E., and Rodolfo E. Manuelli. "A Convex Model of Equilibrium Growth: Theory and Policy Implications." *Journal of Political Economy* 98 (1990): 1008-38.

1.5 Deterministic Dynamic Optimization

1. * SLP Chapters 4 and 6.
2. * LS Chapters 2 and 3.
3. Kamien, Morton I., and Nancy L. Schwartz. *Dynamic Optimization: The Calculus of Variations and Optimal Control in Economics and Management*. Amsterdam: North-Holland, 1991. Part II.

2 Business Cycles (3 weeks)

2.1 Real Business Cycles

1. * Romer Chapter 4.
2. * Lucas, Robert E., Jr. *Models of Business Cycles*, Yrjo Jahnsson Lectures Series. London and New York: Blackwell, 1987.
3. * Hansen, Gary D. "Indivisible Labor and the Business Cycle." *Journal of Monetary Economics* 16 (1985): 309-27.
4. * Campbell, John Y. "Inspecting the Mechanism: An Analytical Approach to the Stochastic Growth Model." *Journal of Monetary Economics* 33 (1994): 463-506.
5. Lucas, Robert E., Jr. "Understanding Business Cycles." *Carnegie Rochester Conference Series on Public Policy* 5 (1977): 7-29.

6. Kydland, Finn E., and Edward C. Prescott. "Time to Build and Aggregate Fluctuations." *Econometrica* 50 (1982): 1345-70.

2.2 Competitive Equilibrium Theory

1. * SLP Chapter 15.
2. * LS Chapter 7.
3. Prescott, Edward C., and Rajnish Mehra. "Recursive Competitive Equilibrium: The Case of Homogeneous Households." *Econometrica* 48 (1980): 1365-79.

2.3 Stochastic Dynamic Optimization

1. SLP Chapters 7, 8, 9, 10, 11, and 12.

3 Inequality: Bewley Models of Incomplete Markets (2 weeks)

1. * LS Chapter 14.
2. * Aiyagari, S. Rao. "Uninsured Idiosyncratic Risk and Aggregate Saving." *Quarterly Journal of Economics* 109, no. 3 (1994): 659-84.
3. * Hugget, Mark. "The Risk-Free Rate in Heterogeneous-Agent, Incomplete Insurance Economies." *Journal of Economic Dynamics and Control* 17 (1993): 953-69.
4. Krusell, Per, and Anthony Smith. "Income and Wealth Heterogeneity in the Macroeconomy." *Journal of Political Economy* 106, no. 5 (1998): 867-96.

4 The Positive Economics of Fiscal Policy (2 weeks)

1. * LS Chapters 8 and 9.
2. * Romer Chapter 11.
3. Barro, Robert J. "Are Government Bonds Net Wealth?" *Journal of Political Economy* 82, no. 6 (1974): 1095-117.
4. Barro, Robert J. "On the Determination of the Public Debt." *Journal of Political Economy* 87 (1979): 940-71.
5. Diamond, Peter A. "National Debt in a Neoclassical Growth Model." *American Economic Review* 55 (1965): 1126-50.
6. Rebelo, Sergio T., and Nancy L. Stokey. "Growth Effects of Flat Rate Taxes." *Journal of Political Economy* 103 (1995): 519-50.

Course Timetable

Lect/TA	Date	Important Events	Rough Outline of Lecture & Section Topics
Lect 1.	9/25 Th		Introduction. Begin growth theory
Sect 1.	9/26 F		Section: math review; dynamical systems.
Lect 2.	9/30 T		Optimal growth in continuous time.
Lect 3.	10/2 Th		Optimal growth. Maximum Principle.
Sect 2.	10/3 F	Problem set 1 due	Section: Review solutions to problem set 1
Sect 3.	10/7 T		Section: Introduction to MATLAB & numerical methods.
Lect 4.	10/9 Th		Endogenous growth theory.
Lect 5.	10/10 F	Problem set 2 due	Optimal growth discrete time. Recursive methods..
Lect 6.	10/14 T		Real Business cycles.
Lect 7.	10/16 Th		Real Business cycles continued.
Sect 4.	10/17 F	Problem set 3 due	Section: Review solutions to problem set 2.
Lect 8.	10/21 T		Stochastic dynamic programming.
Lect 9.	10/23 Th		Dynamic General Equilibrium.
Sect 5.	10/24 F	Problem set 4 due	Section: Review solutions to problem set 3.
Lect 10.	10/28 T		Dynamic General Equilibrium, continued.
Lect 11.	10/30 Th		Recursive competitive equilibrium
Sect 6.	10/31 F		Section: Review of first half of course.
Lect 12.	11/4 T		Finishing business cycles.
	11/6 Th	Midterm Exam	
Sect 7.	11/7 F		Section: Review solutions to midterm exam.
Lect 13.	11/11 T		Heterogeneous agents with incomplete markets.
Lect 14.	11/13 Th		Bewley models.
Sect 8.	11/14 F	Problem set 5 due	Section: Review solutions to problem set 4.
Lect 15.	11/18 T		Finishing Bewley models.
Lect 16.	11/20 Th		Fiscal policy. Flat rate taxes.
Sect 9.	11/21 F	Problem set 6 due.	Section: Review solutions to problem set 5.
Lect 17.	11/25 T		Ricardian equivalence. Overlapping generations.
	11/27 Th	Thanksgiving	No lecture
	11/28 F	Thanksgiving	No section
Lect 18.	12/2 T		Finishing overlapping generations models.
Lect 19.	12/4 Th		Course Review
Sect 10.	12/5 F		Section: Review of problem set 6 & course.
	12/12 F	Final Exam 12:15 – 3:15pm	