

SIMON FRASER UNIVERSITY
Department of Economics

Econ 808 – MACROECONOMIC THEORY
Syllabus – Fall 2020

Prof. Kasa
2666 West Mall Complex
email: kkasa@sfu.ca

Office Hours: Wed. 2:20 – 3:20
Phone: 782-5406

COURSE OBJECTIVES AND PREREQUISITES

This course provides an overview of most of the core topics in macroeconomics. The goal is to learn how to apply the workhorse models of modern macro: the Cass-Koopmans and Diamond optimal growth models, models of endogenous growth and technological progress, the Lucas asset pricing model, the Permanent Income Hypothesis and its extensions, and the Mortensen-Pissarides search model of unemployment. If time permits we will also touch on the already vast literature related to the macroeconomics of COVID-19. The focus will be on theory, but students should be able to understand and interpret empirical work as well.

There is an important unifying methodological theme running throughout the course; namely, the use of recursive methods (eg, dynamic programming) to formulate and analyze complex dynamic stochastic general equilibrium models. One of the goals of the course will be to learn how to think in terms of state variables and Bellman equations. Another goal will be to learn how to solve Bellman equations, both analytically and numerically.

There are five major omissions from the course: (1) Business cycle theory is not covered. Presumably, that was covered in Econ 807, (2) Monetary theory is not covered. Money is either exogenous or abstracted from entirely. (3) Open-economy macro issues are given only slight attention, (4) Recent developments in New Keynesian macro are not discussed, and (5) Models with incomplete markets and heterogeneous agents are not covered explicitly, although we touch on these issues throughout the course. Hopefully, some of these topics will be covered in 809.

COURSE STRUCTURE

The first few weeks of the course will be devoted to learning some of the tools of modern macroeconomics. These include: Markov chains, stochastic difference equations and lag operators, Fourier transforms and spectral densities, and Bellman equations. Students will be asked to write simple MATLAB or PYTHON programs that implement the ideas discussed in class. The remainder of the course will put these tools to use in a variety of economic settings.

COURSE EVALUATION

	<u>Weight in Grade</u>
Problem Sets	– 30%
Midterm exam (To Be Decided)	– 30%
Final exam (To Be Decided)	– 40%

The only way to learn macro is to do macro. Therefore, a key part of the course is a sequence of (approximately) bi-weekly problem sets. Students are encouraged to work in groups, but everyone must turn in their own copy. The problem sets are available as PDF files on the class webpage (at www.sfu.ca/~kkasa/).

COURSE MATERIALS

There is one required book for this course: *Recursive Macroeconomic Theory*, by Lars Ljungqvist and Thomas Sargent (4th Edition, 2018, MIT Press). A pdf scan of the book is posted on the course webpage. There are also a number of journal articles, working papers, lecture notes and Quantecon lectures that are available online or on the course webpage. Throughout the course, I will assume students have a background at roughly the level of David Romer's text *Advanced Macroeconomics*. Hence, students who do not already have a copy may want to acquire one.

COURSE OUTLINE AND READINGS

Readings marked with a (*) are downloadable from the course webpage. Readings preceded by QE are online lectures from the QUANTECON website (python.quantecon.org).

I. RECURSIVE METHODS (5 lectures)

- Sept. 16 – **Introduction and Overview**
Ljungqvist & Sargent, Chpt. 1
QE (Programming), *Introduction to Python* and *The Scientific Libraries*
* Lucas (1976), “Econometric Policy Evaluation: A Critique”
* Sargent (1984), “Autoregressions, Expectations, and Advice”
* Prescott (2006), “The Transformation of Macroeconomic Policy and Research”
* Sargent (2008), “Evolution and Intelligent Design”
- Sept. 17 – **Time Series: Markov Chains and Stochastic Difference Equations**
Ljungqvist & Sargent, Chpt. 2
QE (Basic), *Finite Markov Chains* and *Linear State Space Models*
- Sept. 23 – **Dynamic Optimization: Euler Equations and Bellman Equations**
Ljungqvist & Sargent, Chpt. 3 and Appendix A
* Stokey (2003), “Introduction to Optimal Control”
- Sept. 24 – **Practical Dynamic Programming**
Ljungqvist & Sargent, Chpt. 4 (pgs. 115-124)
* Hall (2010), “Basic Analysis of Forward-Looking Decision-Making”
- Sept. 30 – **Linear-Quadratic Dynamic Programming**
Ljungqvist & Sargent, Chpt. 5 and Appendix B
QE (Basic), *LQ Control: Foundations*
QE (Basic), *The Permanent Income Model & Permanent Income II: LQ Techs.*

II. SEARCH AND MATCHING (5 lectures)

- Oct. 1 – **McCall's Job Search Model**
Ljungqvist & Sargent, Chpt. 6 (pgs. 157-188)
QE (Basic), *Job Search I: The McCall Model*
QE (Basic), *Job Search II: Search and Separation*
- Oct. 7 – **The Mortensen-Pissarides Matching Model**
Ljungqvist & Sargent, Chpt. 29 (pgs. 1213-25)
Mortensen (2011), “Markets with Search Frictions and the DMP Model”
Problem Set 1 due

- Oct. 8 – **Empirical Evaluation of the Mortensen-Pissarides Model**
 * Rogerson & Shimer (2010), “Search in Macroeconomic Models of the Labor Market”
 * Shimer (2005), “The Cyclical Behavior of Equilibrium Unemployment and Vacancies”
- Oct. 14 – **Competitive Search Equilibria**
 Ljungqvist & Sargent, Chpt. 29 (pgs. 1208-12, 1226-27)
 * Moen (1997), “Competitive Search Equilibrium”
 * Rogerson, Shimer & Wright (2005), “Search-Theoretic Models of the Labor Market”
- Oct. 15 – **Comparing Alternative Theories of Unemployment**
 * Ljungqvist & Sargent (2003), “European Unemployment: From a Worker’s Perspective”
 * Ljungqvist & Sargent (2005), “Jobs and Unemployment in Macroeconomic Theory”
 * Ljungqvist & Sargent (2008), “Two Questions About European Employment”

III. COMPLETE MARKETS GENERAL EQUILIBRIUM (2 lectures)

- Oct. 21 – **The Arrow-Debreu Model**
 Ljungqvist & Sargent, Chpt. 8 (pgs. 249-266)
 Problem Set 2 due
- Oct. 22 – **Recursive Implementation of Arrow-Debreu Equilibria: Arrow Securities**
 Ljungqvist & Sargent, Chpt. 8 (pgs. 266-288)

IV. GROWTH THEORY (4 lectures)

- Oct. 28 – **The Cass-Koopmans Model**
 Ljungqvist & Sargent, Chpt. 15 (pgs. 631-636)
 Romer, Chpt. 2 (pgs. 56-76)
 * Lucas (2003), “Macroeconomic Priorities”
- Oct. 29 – **The Diamond Model**
 Romer, Chpt. 2 (pgs. 76-92)
- Nov. 4 – **Endogenous Growth I**
 Ljungqvist & Sargent, Chpt. 15 (pgs. 637-654)
 Romer, Chpt. 3 (pgs. 100-125)
 * Romer (1994), “The Origins of Endogenous Growth”
 * Lucas (1988), “On the Mechanics of Economic Development”
 * Lucas (1990), “Why Doesn’t Capital Flow from Rich to Poor Countries?”
- Nov. 5 **Midterm Exam (?)**
- Nov. 11 **Remembrance Day (No Class)**
- Nov. 12 – **Endogenous Growth II**
 Romer, Chpt. 3 (pgs. 144-165)
 * Prescott (1998), “Needed: A Theory of Total Factor Productivity”
 * Parente & Prescott (1999), “Monopoly Rights: A Barrier to Riches”
 Problem Set 3 due

V. ASSET PRICING (2 lectures)

- Nov. 18 – **Euler Equations and Martingale Measures**
Ljungqvist & Sargent, Chpt. 13 (pgs. 503-524)
QE (Basic), *Asset Pricing: Finite State Models*
* Lucas (1978), “Asset Prices in an Exchange Economy”
- Nov. 19 **Hansen-Jagannathan Bounds and the Equity Premium Puzzle**
Ljungqvist & Sargent, Chpt. 14 (pgs. 549-591)
* Constantinides & Duffie (1996), “Asset Pricing with Heterogeneous Consumers”

VI. FISCAL POLICY (2 lectures)

- Nov. 25 – **Ricardian Equivalence**
Ljungqvist & Sargent, Chpt. 10
QE (Advanced), *How to Pay for a War: Part 1*
- Nov. 26 – **Fiscal Policies in the Growth Model**
Ljungqvist & Sargent, Chpt. 11
Problem Set 4 due

VII. MACROECONOMICS OF PANDEMICS (2 lectures)

- Dec. 2 – **The Basic SIR Model**
QE (Basic), *Modeling COVID-19*
* Atkeson, Kopecky & Zha (2020), “Estimating & Forecasting Disease Scenarios...”
* Atkeson, Kopecky & Zha (2020), “Four Stylized Facts about COVID-19”
- Dec. 3 – **Pandemic Responses Under Ambiguity**
* Barnett, Buchak & Yannelis (2020), “Epidemic Responses Under Uncertainty”
- Dec. 9-16 – **FINAL EXAM (exact date not yet decided)**
Problem Set 5 due