DEPARTMENT OF ECONOMICS
MACROECONOMIC THEORY I

Fall 2023

Professor:	Caroline Betts
Class time:	**KAP 319** Tuesday, Thursday, 10.00 am–11.50 am
Office hours:	By appointment on Thursday mornings 9.00 am–10.00 am, via Zoom Wednesdays 10 am–12 pm.
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TA:	TBD
TA email:	TBD

COURSE GOALS AND OVERVIEW

This course equips students with some essential analytical and computational tools for studying modern macroeconomics. The goal of the course is to prepare students for further graduate study and research in macroeconomics. We introduce two workhorse dynamic general equilibrium models of modern macroeconomic theory–the neoclassical growth model and the overlapping-generations model–and develop techniques needed to analyze them. We apply variants of the two workhorse models to study long-run economic growth, technological change, great depressions, wealth inequality, and structural change.

The course emphasizes student learning-by-doing through problem solving. In addition to the two lectures per week provided by the instructor, the graduate teaching assistant supervises discussion and computation sessions. Homework assignments involve analytical as well as data and computational exercises. Temporal synchronization of the lecture material and the discussion session material is sought, although is neither essential nor always possible.

Although there is no single required textbook that is suitable for the course, a selection of textbook and online lecture note references are useful. The instructor's lecture notes form the basis of the course, a summary of which constitutes the power point slides presented in lectures, and these are periodically supplied to students.

TEXTBOOKS

Textbooks useful for the course, from each of which we will select some chapters, are

1. *Recursive Macroeconomic Theory* (Lars Ljungqvist and Thomas J. Sargent), fourth edition, MIT Press (2018).
   (Exercises and solutions for the first edition are available, and can be used for practice, at this link: https://pages.stern.nyu.edu/~svnieuwe/pdfs/masterex.pdf)

2. *Recursive Methods in Economic Dynamics* (Nancy L. Stokey and Robert E. Lucas with Edward C. Prescott) Harvard University Press (1989)

These books will also be useful in the second semester, in preparing for your core examinations, and are good references to basic theory for any macroeconomist.

3. *Numerical Methods for Macroeconomists with Julia and Matlab codes* (Jeremy Greenwood and Ricardo Marto), online version:
   https://www.ricardomarto.com/files/NM4M.pdf

This is a helpful reference, covering some interesting macroeconomic models and issues and providing computational "assists" for those new to Matlab and Julia.

PROBLEM SETS

Students will complete approximately six problem sets throughout the semester. These are graded and returned. The teaching assistant presents solutions in discussion sessions and will supply answer guides subsequently that he makes available through Blackboard. Please sign into Blackboard as soon as you receive this syllabus, as it is the primary mode for communication in the course. Students must submit all the problem sets, and complete both examinations, for the instructor to award a complete final grade for the course.

EXAMINATIONS

There will be a midterm examination, on **Tuesday October 10¹ʰ from 10am to 11.50am,** and a final examination on **Tuesday December 12th from 8am to 10am**. If you cannot attend the midterm or final examination due to a verifiable medical emergency, then we will assign a makeup examination. If you cannot attend an examination for any other reason, a grade of 0 will be assigned to that paper. The final examination is not cumulative.

EVALUATION

The exact breakdown of the evaluation of each student's work in the course is as follows, and is immutable:

Problem Sets:	30% (roughly 5% per problem set)
Midterm:	35%
Final Exam:	35%

ACADEMIC ACCOMMODATIONS

Any student requesting academic accommodations based on a disability is required to register with Office of Student Accessibility Services (OSAS) each semester. Such a student must acquire a letter of verification for approved accommodations from OSAS and deliver it to the instructor as early as possible in the semester. OSAS is located in GFS 120 and is open 8.30am-5.00pm, Monday through Friday. The phone number for DSP is (213) 740-0776 and the website address is https://osas.usc.edu/.

ACADEMIC CONDUCT

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, "Behavior Violating University Standards". Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

Class notes provided online by the instructor are for your *personal study use only*. They are the property of the instructor, and cannot be shared electronically or in hard copy, sold, or otherwise transferred to any other person, business, or institution.

Discrimination, sexual assault, intimate partner violence, stalking, and harassment are prohibited by the university. You are encouraged to report all incidents to the *Office of Equity and Diversity/Title IX Office,* http://equity.usc.edu, and/or to the *Department of Public Safety* http://dps.usc.edu. This is important for the health and safety of the whole USC community. Faculty and staff must report any information regarding an incident to the Title IX Coordinator who will provide outreach and information to the affected party. The sexual assault resource center webpage http://sarc.usc.edu fully describes reporting options. Confidential relationship and sexual violence services are available 24/7 at https://engemannshc.usc.edu/rsvp.

SUPPORT SYSTEMS

A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* http://ali.usc.edu, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* http://osas.usc.edu provides certification for students with disabilities and helps arrange the relevant accommodations.

COURSE OUTLINE

1. INFINITELY LIVED AGENT MODEL

Infinite horizon pure exchange economy
Arrow-Debreu equilibrium
Sequential markets equilibrium
Pareto efficient allocations
Welfare Theorems and Negishi's algorithm

Readings
Instructor's notes
Lecture notes Chapter 2 by Dirk Krueger
Llungqvist and Sargent, Chapter 8
Negishi, T. (1960) "Welfare Economics and Existence of an Equilibrium for a Competitive Economy", *Metroeconomica* **12** 92-97
Kehoe, T. (1989) "Inter-temporal General Equilibrium Models", in F. Hahn (ed.) *The Economics of Missing Markets* Clarendon Press

2. THE OVERLAPPING GENERATIONS MODEL

Pure exchange economy
Monetary and non-monetary equilibria
Welfare properties of equilibria
Social security

Readings
Instructor's notes
Lecture notes Chapters 8 and 9 by Dirk Krueger
Ljungqvist and Sargent, Chapters 9 and 10
Sargent, Chapter 7
Stokey et al., Chapter 17

T. J. Kehoe (1989) "Intertemporal General Equilibrium Models," in F. Hahn, editor, *The Economics of Missing Markets, Information, and Games* Claredon Press, 363–393

P. A. Samuelson (1958) "An Exact Consumption Loan Model of Interest, With or Without the Social Contrivance of Money*," Journal of Political Economy* **66** 467– 482

N. Wallace (1980) "The Overlapping Generations Model of Fiat Money," in J. H. Kareken and N. Wallace, editors, *Models of Monetary Economies*, Federal Reserve Bank of Minneapolis

3. THE NEOCLASSICAL GROWTH MODEL

Infinite horizon production economy
Dynamic programming
Pareto efficient allocations, using sequential and recursive methods
Recursive competitive equilibrium

Readings

Instructor's notes
Lecture notes Chapter 3 by Dirk Krueger (4 and 5 optional)
Llungqvist and Sargent, Chapters 3-5 and Chapters 7 and 8
Stokey and Lucas, Chapters 2 through 6
Sargent, Chapter 1
Greenwood and Marto (overview), Chapters 1–7, especially 6.

4. EXOGENOUS AND ENDOGENOUS ECONOMIC GROWTH

An exogenous growth model
The Diamond growth model
The AK model
Human capital
Innovation

Readings

Instructor's notes
Ljungqvist and Sargent, Chapter 15
Lucas, R.E. Jr. (1988) "On the Mechanics of Economic Development", *Journal of Monetary Economics* **22** 3-42
Romer, Paul M. (1986) "Increasing Returns and Long-Run Growth," *Journal of Political Economy* **94** 1002-1037
Romer, Paul M. (1987) "Growth Based on Increasing Returns Due to Specialization", *American Economic Review Papers and Proceedings* **77** 56-62

Rebelo, Sergio (1991) "Long-Run Policy Analysis and Long-Run Growth," *Journal of Political Economy* **99** 500-521

5. GREAT DEPRESSIONS AND GROWTH ACCOUNTING

Growth accounting framework for the neoclassical growth model
Great depressions of the 20th century

Readings
Instructor's notes
Kehoe, T.J. and E.C. Prescott (2007) *Great Depressions of the Twentieth Century* Federal Reserve Bank of Minneapolis

6. MULTI-SECTOR GROWTH MODELS AND STRUCTURAL CHANGE

Kuznets growth facts
Structural change in a neoclassical growth model
Structural change and balanced growth

Readings
Instructor's notes
Herrendorf, Berthold, Rogerson, Richard, and Akos Valentinyi (2014) "Structural Change and Economic Growth", in *Handbook of Economic Growth*

7. WEALTH INEQUALITY IN THE GROWTH MODEL

Facts of wealth and income inequality
Lorenz curves and Gini coefficients
Aggregation when agents have heterogeneous wealth
Distribution of wealth in a neoclassical growth model

Readings
Instructor's notes
Chatterjee, S. (1994) "Transitional dynamics and the distribution of wealth in a neoclassical growth model", *Journal of Public Economics*