Syllabus for Economics 7200
Fall 2024 - Part 1
Dirk Krueger

Organization

Time of Class:	Monday and Wednesday 10:15-11:45 in PCPE 100
TA Sessions	Friday 9-11am in PCPE **TBD**
Instructor:	Dirk Krueger
Office:	520 PCPE
Email:	dkrueger@upenn.edu
Office Hours:	Monday 12:00-1:00, Tues. 10:45-11:45, and by appointment
Web Page:	Canvas: https://canvas.upenn.edu/
TA:	Mariia Elkina, elkina@sas.upenn.edu
Office Hours:	**TBD**

Textbooks

For most of the course I will provide detailed lecture notes and slides on the Canvas course website. These notes should be read first, before turning to the other references. In addition, the following textbooks are useful sources of additional information, with the Ljungqvist and Sargent book being one every student should possess as reference for the entire first year macro sequence.

1. Lars Ljungqvist and Thomas J. Sargent, *Recursive Macroeconomic Theory 4th edition*, The MIT Press (2018)

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

3. Daron Acemoglu, *Introduction to Modern Economic Growth*, Princeton University Press (2009)

4. Thomas Cooley, *Frontiers of Business Cycle Research,* Princeton University Press (1995)

5. Marina Azzimonti, Per Krusell, Alisdair McKay, and Toshihiko Mukoyama, *Macroeconomics*, Incomplete Draft (2024), https://phdmacrobook.org/

Goal of the Course

This course is an introduction to dynamic macroeconomic theory. It is based on general equilibrium theory and recursive methods and language. It consists of several self-contained modules. In each module we will combine the learning of techniques with a specific substantive topic. This hopefully will motivate you to learn the techniques, and also makes it possible to use the techniques in applications to macroeconomics, finance and public finance. I will assign both theoretical exercises and computational assignments, recognizing that for some of you this is the first time you write computer code to solve economic models. After the course everybody will be able to speak the Arrow-Debreu and recursive language, write simple code in MATLAB, Python, Julia, C++ (or some other programming language of your choice), and apply these techniques to hopefully interesting questions in macro, public finance, labor and growth. The second part of economics 7200 and then 7400 will use these techniques for further applications in the areas mentioned above.

Grading Policy

There will be three home works and a final for my part of the course. Home works count for a total of 30%, with each homework counting 10%, and the final exam counts for 70% of your grade. To obtain a passing grade all home works have to be handed in on time and exam has to be taken.

Exam

The exam is an in-class exam and will be given on the date specified in the calendar below. The exam will be a closed-book exam.

Home Work

Students are encouraged to cooperate on home works. Every student, however, has to hand in her/his uniquely written assignment and **acknowledge cooperation**, if any, on the first page of each homework. In light of the exams the strategy of just copying another student's assignment (or the solution of a related homework from the past) will prove counter-productive. Home works are due on Canvas at noon on the day stated in the calendar below

We will provide suggested solutions to the home works on-line. In order to reduce the grading burden on the TA, assignments will be graded randomly, that is, for each home work one question will be graded based on content, and the rest graded simply based on completion. It is therefore highly recommended that you compare your own solutions with those posted by us, in order to understand the mistakes you have made (and detect the mistakes we might have made).

Topics of the Course

The following list may prove too ambitious for one half of one semester, so it is possible that we will not be able to cover all the topics. A general rule is that I will not compromise on rigour. I rather cover less topics, but cover these carefully, than too many topics superficially. The references are meant to be additional reading, in addition to the lecture notes. For each topic, they are ordered in *decreasing* degree of relevance to what I teach in class.

1. Arrow-Debreu Equilibria, Sequential Markets Equilibria and Pareto Optimality in Simple Dynamic Economies

    - Kehoe, T. (1989): "Intertemporal General Equilibrium Models," in F. Hahn (ed.) *The Economics of Missing Markets, Information and Games,* Clarendon Press
    - Ljungqvist and Sargent, Chapter 8.
    - Negishi, T. (1960): "Welfare Economics and Existence of an Equilibrium for a Competitive Economy," *Metroeconomica*, 12, 92-97.

2. The Neoclassical Growth Model, Calibration and Dynamic Programming

    - Stokey et al., Chapter 2-4.
    - Ljungqvist and Sargent, Chapters 3-5 and 12.
    - Prescott, E. and R. Mehra (1980): "Recursive Competitive Equilibrium: the Case of Homogeneous Households," *Econometrica*, 48, 1356-1379.

3. Models with Risk, Asset Pricing and the Real Business Cycle Model

   - Ljungqvist and Sargent, chapters 2, 13 and 14.
   - Cooley (ed.), chapter 1 and 2.
   - Stokey et al., chapter 8 and 9.
   - Weil, P. (1989): "The Equity Premium Puzzle and the Risk-Free Rate Puzzle," *Journal of Monetary Economics*, 24, 401-421.
   - McGrattan, E. and E. Prescott (2012): "The Labor Productivity Puzzle," *Minneapolis FED Working Paper* 694

Tentative Calendar

Table shows the schedule of the course. It is tentative and subject to change. The exam date set is in stone, though.

Date	Topic	Lecture Notes	Assignments
August 28	Introduction and A Simple Dynamic Model	Chapter 2.1-2.2.2	
Sept 4	A Simple Dynamic Model: Equilibrium	Chapter 2.2.3	
Sept 6	A Simple Dynamic Model: Efficiency	Chapter 2.2.4	
Sept 9	Sequential Markets	Chapter 2.2.5	
Sept 11	Utility Theory	Chapter 2, Appendix	
Sept 13	*TA Session:* Matlab Review		
Sept 16	Neoclassical Growth Model: Setup and Recursive Formulation	Chapter 3.1-3.2.1-3	**HW 1 due**
Sept 18	Neoclassical Growth Model: Dynamics, Steady States	Chapter 3.2.4-3.2.6	
Sept 20	*TA Session:* Math Review for DP and Review of HW 1	Chapter 4.1-2	
Sept 23	Competitive Equilibrium and Calibration	Chapter 3.3-3.4	
Sept 25	Theory of Dynamic Programming I	Chapter 4.3	
Sept 27	*TA Session:* Math Review for Markov Processes	Chapter 6.4	
Sept 30	Theory of Dynamic Programming II	Chapter 5.1-5.2	**HW 2 due**
Oct 2	Models with Risk: Equilibrium and Optimality	Chapter 6.1-6.2.4	
Oct 7	Models with Risk: Asset Pricing	Chapter 6.3	
Oct 9	Stochastic Neoclassical Growth Model and RBC Model	Chapter 6.5	
Oct 11	*TA Session:* Review of HW 2		
Oct 14	*TA Session:* Review of HW 3 & Preparation for Final		**HW 3 due**
Oct 16	**Final**		

Table 1: Class Calendar with Assignment and Exam Dates