

Economics 7344-1: Macroeconomic Theory II

Spring 2018

Course Description and Objectives

This course introduces some tools and cover topics of modern macroeconomics at the graduate level. The course is technical in nature and will focus on central models of modern macroeconomics. The ultimate objective is to learn to use a variety of models that can be used to give quantitative answers to economic questions. It has two parts that are described below. The first one is taught by German Cubas and the second by Bent Sorensen.

Course Requirements and Grading

Problem sets will be assigned regularly. You are strongly encouraged to discuss the assigned exercises with your fellow classmates. However, you should submit your own answers to the TA by the established deadline. Your course grade will be determined by the grades on problem sets (40%), and two tests, each worth (30%).

Part I — Jan/16-Feb/28

Prof. German Cubas

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Office hours: Mondays 10:30P-11:30P

Time and Location: 08:30A - 10:00A, MW M212

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This fraction of the course emphasizes the dynamic environment in which agents interact and the resulting equilibrium outcomes. We will study the basic settings of general equilibrium frameworks with uncertainty, models with agent heterogeneity, competitive equilibrium in dynamic environments, as well as the efficiency properties of equilibrium allocations. We will develop the necessary tools as the course progresses. For instance, you will learn some numerical and computational methods that are used to solve dynamic general equilibrium models.

Course Outline (Tentative)

- Review of Sequential Methods and Dynamic Programming (Finite and Infinite Horizon, Deterministic and Stochastic) (1 class)
- Solution Methods, Basic Algorithms (1 classes)

- Linearized Models: Solution Methods, Real Business Cycle Facts, Model and Calibration (2 class)
- Competitive Equilibrium in Dynamic Stochastic Models (Date-0 trade, Sequential Trade and Recursive) (2 classes)
- Aggregation in Macroeconomics (1 class)
- Income Fluctuation Problem (Complete Markets, Uncertainty, Incomplete Markets, Borrowing Constraints, Solution Technics) (2 classes)
- Economies with Idiosyncratic Risk and Incomplete Markets (Models, Solution Technics and Calibration) (3 classes)
- Search and Unemployment (2 classes)

Materials

The main material for the course consists of my own lecture notes and other notes written by several prominent macroeconomists, such as Per Krusell and Steve Williamson. Additionally, there are some supplemental journal articles. I will also provide extra material through Blackboard. As for textbooks, good, general references texts are:

- Recursive Macroeconomic Theory, by L. Ljungqvist and T. Sargent (M.I.T. Press).
- Recursive Methods in Economic Dynamics (1989) by N. Stokey and R. Lucas, Harvard University Press.
- Advanced Macroeconomics, by D. Romer (2011).
- Economic Growth and Business Cycles by Cooley, T. and Prescott, E. (1995), in Cooley, T. Frontiers of Business Cycles Research, Princeton University Press.

Throughout the semester, we will integrate the use of computational tools for helping to solve our models; you will want a guide for learning these.

This is not a course in computer languages so students are responsible to learn to write computer programs. There are various general classes of computer languages. Matlab, Python and R are very popular packages in economics. Matlab is available to UH students and Python and R are open source. I highly recommend the last two as they are becoming very popular across disciplines, it is worth the investment at this stage of your career.

There are plenty of books and resources online to learn these languages. Good options are:

- Getting Started with MATLAB: A Quick Introduction for Scientists and Engineers, Rudra Pratrap, Third Edition. Oxford University Press, 2009.
- Matlab: An Introduction with Applications, Amos Gilat, Second or Third Edition. Wiley Press
- Fortran 95/2003 for Scientists & Engineers, Stephen Chapman, Third Edition, McGraw-Hill Science/Engineering/Math, 2007.
- <http://lectures.quantecon.org/py/learning-python.html>

- <http://web.stanford.edu/class/ee254/software/using-ml.pdf>
- <http://www.ats.ucla.edu/stat/r/>
- <https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf>
- <http://www.cs.mtu.edu/~shene/COURSES/cs201/NOTES/fortran.html>
- <http://www.chem.ucl.ac.uk/resources/history/people/vanmourik/images/Fortran2095-manual.pdf>

Part II — Mar/5-Apr/30

Prof. Bent Sorensen

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Office hours: TBC

Time and Location: 08:30A - 10:00A, MW M212

Email:

TA: Hamza Zahid

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In this part of the course we cover:

- We take a little historical detour and cover Friedman's consumption function which underlies the modern PIH model.
- We then cover some time series methods, which is one of the main tools in modern macro, although we here will use to predict the reaction of consumption to income shocks. Here I focus on univariate impulse response functions (you may have seen impulse response functions, but I assume you have not done the underlying theory).
- Then the most used tool in all of macro and finance: the Euler equation. You have seen it before we here we discuss its most general form.
- Armed with the Euler equation we cover the PIH consumption model in detail.
- Then we cover uses of Euler equations in finance, including a discussion of how older theories—the efficient market hypothesis and the CAPM—can be seen in view of the Euler equation.
- I cover briefly a paper of my own in the JPE which argues that the PIH probably fails in fitting aggregate U.S. data so well because it ignores the general equilibrium restriction and suggest a test using state level data.
- The rest of the semester, we attach General Equilibrium issues head on following the pedagogical two-period, two-agent set-up of in chapter 5 of Obstfeld and Rogoff's "Foundations

of International Macroeconomics" textbook. (When you fully understand this setup it is easy to understand many period, many agent versions and exam will sometimes ask questions in these more general frameworks. Be aware that Obsfeld and Rogoff discuss two countries, but it can be any two agents for almost all the material.)

This is a little tentative, because I haven't done the half-course before so maybe we won't get to it all. Also, I may be a little off in what you already know. Almost all material is covered in lectures notes that you can download from the class WEB-page. A lot of the material overlap with the material covered by Professor Cubas, but goes into more detail with the intuition (there will be no computer homeworks in this part of the course.)