

Universidad Carlos III de Madrid
Department of Economics

Ph.D. Economics, 1st year

Macroeconomics II

Second Semester 2015-2016

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Aim: This course has two major aims: 1) get you acquainted with the non-stochastic and stochastic versions of the neoclassical growth model and the consumption-savings problem, two of the main workhorses of modern macroeconomics. 2) get you acquainted with *Dynamic Programming*, a powerful tool for solving dynamic optimization problems. 3). get you acquainted with a set of models that are important in modern macroeconomic theory (cyclical fluctuations; frictions in the money, financial and labor markets).

Readings: We will cover material from the first six chapters of *Recursive Methods in Economic Dynamics* by Stokey, Lucas, with Prescott (SLP), Harvard University Press (1989). These six chapters cover non-stochastic dynamic programming problems. We will also use chapters from *Recursive Macroeconomic Theory* by Lars Ljungqvist and Thomas Sargent (LS), MIT Press (2004).

As math supplements to Stokey, Lucas, with Prescott, you may find it helpful to consult *A First Course in Optimization Theory*, by R. Sundaram, Cambridge University Press (1996).

There will also be a set of lecture notes by Nezh Guner, referred to below as NG, and my own lecture notes on continuous-time material.

Grading: Assignments (20%), midterm exam (30%), final exam (50%).

Please check my web page www.eco.uc3m.es/mkredler for announcements, problem sets etc.

Course Outline

1. Dynamic Programming under Uncertainty
 - (a) finite horizon (NG ch. 6.1-6.2, Sundaram ch. 11)
 - (b) infinite horizon
 - i. Mathematical Preliminaries: Metric Spaces, The Banach Fixed-Point Theorem, The Theorem of Maximum (NG ch. 7, SLP ch. 3, Sundaram ch. 12)
 - ii. Basic results (NG ch. 8-10, SLP ch. 4-5, Sundaram ch. 12)
 - (c) application to the growth model (NG ch. 6.2, LS ch. 11)
 - (d) comparison to the Lagrangian approach: Euler equations and transversality conditions
2. Dynamic Programming under Uncertainty (NG, Chapter 12).
 - (a) Stochastic version of one-sector growth model and consumption-savings problem: Event-tree formulation, Markov chains.
 - (b) Recursive Competitive Equilibrium (NG ch. 12.6, LS ch. 12)
3. Continuous-time dynamic programming (own lecture notes)
4. Cyclical fluctuations
 - (a) Empirical evidence
 - (b) Real-business-cycle (RBC) models
 - (c) Linearization solution methods and the connection to vector auto-regressions (VARs)
 - (d) Computation by *Dynare*
5. Monetary policy
 - (a) Empirical evidence
 - (b) Introducing money into the RBC model
 - (c) Nominal rigidities

- (d) Monetary policy
- (e) The New-Keynesian model

6. Financial frictions

- (a) Empirical evidence
- (b) The financial accelerator
- (c) Credit cycles

7. Search-and-matching models for labor markets

- (a) Empirical evidence
- (b) The Pissarides model
- (c) Efficiency: the Hosios condition
- (d) The Shimer puzzle and possible solutions