

12E013

## Advanced Macroeconomics II

Term 2 – 6 ECTS

Elective Course

Prof. Isaac Baley

Prof. Édouard Schaal

### Prerequisites to Enroll

To have taken and passed Advanced Mathematics (Brush-up courses) and Advanced Macroeconomics I (12E003). A good working knowledge of mathematics (linear algebra, real analysis and statistics) is required. Basic knowledge of computer programming (MATLAB, Fortran, C, etc.) is recommended.

### Overview and Objectives

In the first part of this course, we study the behavior of two key components of GDP: consumption and investment. The first objective is to develop economic models that describe consumption and investment decisions by households and firms, and evaluate their empirical performance at business cycle frequency. The second objective is to familiarize you with the techniques used in modern macroeconomics to analyze intertemporal optimization problems with uncertainty, such as stochastic dynamic programming, as well as their computational implementation.

In the second part, we combine what you learned about consumption and investment and study business cycles. Our goal is to understand the causes and consequences of the recurrent fluctuations in aggregate economic activity around the long-run trend that characterize developed economies. Focusing on two of the most important business cycle indicators, output and employment, we review two important classes of “real” models. First, we review the Real Business Cycle (RBC) model, a stochastic version of the neoclassical growth model augmented with an endogenous labor supply margin. In the second half, we move away from the frictionless world depicted by the RBC model to consider labor market imperfections in the form of search frictions (the Diamond-Mortensen-Pissarides or DMP model). In spite of various successes along some dimensions, neither model performs well at matching the data on business cycle fluctuations, especially for the labor market. We discuss various extensions that have been proposed to improve these models.

### Course Outline

#### First part:

1. Stochastic Dynamic Programming
2. Investment
3. Numerical Dynamic Programming
4. Consumption
5. Asset Pricing

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### Second part:

1. Real Business Cycle Theory
2. A Primer on Numerical Methods
3. Business Cycle Facts
4. Empirical Performance of the RBC Model
5. Search-and-Matching Models
6. Empirical Performance of Search-and-Matching Models

### Required Activities

A problem set will be assigned each week, which will be solved in groups of 3-4 students. The solutions (preferably typed in Latex) must be handed in to the TA before each seminar, where the solutions and additional material will be explained.

### Evaluation

Exam (80%) and Problem Sets (20%).

### Competences

- Capacity of utilization of the theoretical instruments of the to analyze situations of coherent form.
- Ability to use the appropriate (statistical and numerical) techniques.
- Ability to identify and successfully search for the data necessary for the analysis, either grossly or in the form of more elaborate databases.
- Ability to make independent judgments and defend them dialectically.
- Ability to write formal reports.
- Acquire a solid knowledge base for the study of quantitative issues.
- Ability to Recognize and know how to use the principles of econometrics and statistics.
- Ability to work with microeconomic analysis tools and their empirical and theoretical applications.

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### Learning Outcomes

- Students should get an overview of economic and financial theory.
- Students must be able to recognize theories and present arguments with precise examples.
- Students will have the ability to understand how markets work and explain their weaknesses.
- Students will acquire the technical tools that will allow them to perform the advanced analytics required in the second module as econometric methods.
- Students will know what the appropriate inference for each situation is.

### Materials

#### Main Books:

- Adda and Cooper, Dynamic Economics, MIT Press, 2003.
- Ljungqvist and Sargent, Recursive Macroeconomic Theory, MIT Press, 2012.
- Romer, Advanced Macroeconomics, McGraw Hill, 2001 or later.
- Stokey, Lucas, Prescott, Recursive Methods in Economic Dynamics, Harvard University Press, 1989.

#### Papers:

- A list of papers will be posted online, some of which will be required readings.