MRes Macroeconomics 1
Syllabus

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Unit code:	EFIMM0020
Level:	MRes
Credit point value:	15
Unit director:	Etienne Lalé
Lecturer:	Etienne Lalé
Prerequisites:	N/A
Co-requisite:	MRes Mathematics for Economics (EFIMM0023)
Teaching:	20 hours lectures
	10 hours tutorials
Assessment:	Formative: Class participation and discussion in tutorials
	Summative: Weekly exercises on various topics (15%), 3-hour written exam (85%)
Office location:	Social Sciences complex, office 2B11
Office hours:	Wednesday 4:30pm - 5:30pm

1 Description of the Course

The purpose of this unit is provide training in some of the methods and tools of modern macroeconomics, and use them to study selected topics in advanced macroeconomics. The focus is on recursive methods and their application to the analysis of discrete-time environments with uncertainty. We use recursive methods not only to describe, but also to develop numerical solutions to compute such environments. We perform numerical computations using MatLab. The applications relate to consumption/savings and labor. We study the two arguably most central workhorses of modern macroeconomic theory: the incomplete market model (Bewley-Huggett-Aiyagari) and the search-matching model (Diamond-Mortensen-Pissarides). We analyze environments with idiosyncratic uncertainty, and then we introduce aggregate uncertainty.

2 Classes and Course-work

The course is taught in two parts. The first part deals with dynamic programming. It studies how to formulate intertemporal problems in recursive form, describes some essential properties of the Bellman equation and introduces computational methods for solving dynamic programs. Two examples are considered: a continuous decision problem (consumption) and a binary decision (sequential search). Finally, it discusses how to aggregate individual outcomes so as to obtain an equilibrium with multiple agents. The second part applies dynamic programming tools to the study of consumption/savings models and search models.

There is one two-hour lecture and one one-hour tutorial session per week. Problem sets and numerical applications are analyzed mostly during the tutorials (though the main principles are discussed during the lectures). The course material is distributed through Blackboard.

The **course assessment** is based on regular homeworks (15% of the final mark) and a final exam (85% of the final mark). The coursework consists of weekly exercises which are used for course assessment. The final exam is three-hour closed book examination at the end of the Autumn term. Details of the examination paper will be given during the lecture.

3 Course Outline

Theory:

1. Basic of dynamic programming
2. Essentials of Markov chains
3. Practical dynamic programming

Application I

1. Consumption/savings problems
2. The incomplete-market model
3. Incomplete market with aggregate shocks

Application II

1. Optimal stopping problems
2. The search-matching model
3. Search-matching with aggregate shocks

4 Relevant Books

The following textbooks cover the essential topics of the course. Students will be referred to parts of these books as we proceed through the lectures:

- Jérôme Adda and Russell Cooper. *Dynamic Economics : Quantitative Methods and Applications*. Cambridge, Mass. ; London : MIT Press, 2003 (available in the Arts and Social Sciences Library, ref. HB135 ADD)
- Lars Ljungqvist, Thomas J. Sargent. *Recursive Macroeconomic Theory*. Cambridge, Mass. : MIT Press, 2nd Edition, 2004. (available in the Arts and Social Sciences Library, ref. HB172.5 LJU)
- Nancy L. Stokey Robert E Lucas; Edward C Prescott. *Recursive Methods in Economic Dynamics*. Cambridge, Mass. ; London : Harvard University Press, 1989. (available in the Arts and Social Sciences Library, ref. HB135 STO)

References to academic articles (most of which are available through JSTOR) will be given during the lecture.