

Doctoral School in Economics and Finance

2019-2020

Advanced Macroeconomics II (Part 2)

1. Course details

Semester: 1

Credit rating: 2 ECTS

Pre-requisite(s): The prerequisite for this course is Advanced Macroeconomics I of the Master in Economics and Finance (Research Track).

Lecturers: Christos Koulovatianos (University of Luxembourg)

Administrator: Roswitha Glorieux

Seminar times and rooms: Wednesdays from 9:30am until 11:45 am

Communications It is important that students regularly read their University e-mails, as important information will be communicated this way.

Reading week: -

Mode of assessment: oral exam and assignments

Additional work: TBA

Examination Periods: -

Course WebPage: [Moodle.uni.lu](https://moodle.uni.lu)

2. Aims and objectives

Aims

This course connects students to the research frontier of modern Macroeconomics. It builds on and complements the PhD training in Macroeconomics that begins with the course *Advanced Macroeconomics I* of the Master in Quantitative Economics and Finance (past Research Track). The course content includes most recent advances business cycle theory, heterogeneous-agent models, financial stability and asset pricing. An introduction to dynamic fiscal policy will introduce students to normative and predictive issues. The course emphasizes theoretical foundations, empirical applications, policy analysis, and computational methods. Emphasis is given to continuous-time stochastic numerical dynamic programming and viscosity solutions and to state-of-the art financial-stability models with endogenous crises.

Learning Objectives

Upon successful completion of this course students will be able to:

- understand and contribute to the theory and policy of business cycles, heterogeneous-agent models and asset pricing
- understand and apply numerical techniques of dynamic optimization (Matlab)
- understand and apply calibration techniques
- understand the new economics of endogenous crises

3. Plan of semester

The lectures are set up in a block of 30 TU (including 7.5 TU for recitation lectures) and take place at the University of Luxembourg.

WEDNESDAY	Room Campus Kirchberg	Time	Seminar Lecture
		09.30 – 11.45 a.m.	
(1) 8 Dec. 9:30-11:45 (2) 15 Dec. 9:30-11:45 (3) 22 Dec. 9:30-11:45 (4) 5 Jan. 9:30-11:45 (5) 12 Jan. 9:30-11:45 (6) 19 Jan. 9:30-11:45 (7) 26 Jan. 9:30-11:45 (8) 2 Feb. 9:30-11:45 (9) 8 Feb. 9:30-11:45 (10) 15 Feb. 9:30-11:45	TBA		<ul style="list-style-type: none"> - Numerical techniques (grid search, finite differences, quadratic approximation, projection), minimum-distance fitting, bootstraps - Dynamic programming (deterministic and stochastic), Monte-Carlo simulation, Markov chains, and their role for dynamic-stability analysis - Real-business- cycle facts and models - Borrowing constraints and computation, portfolio choice, heterogeneous-agent models, wealth-inequality determinants - Asset-pricing models and their computation - Learning in Macroeconomics and Finance - Continuous-time approach to Macro, Finance (asset pricing), Financial stability (banks), Inside/outside Money, heterogeneity - Viscosity solutions and applications (e.g., housing markets) - Modeling and computing endogenous crises - Dynamic optimal fiscal policy and dynamic contracts

4. Course details

Heer, Burkhard and Alfred Maußner, *Dynamic General Equilibrium Modelling: Computational Methods and Applications*, Springer, Berlin, 2009, 2nd.edition

Yves Achdou, Jiequn Han, Jean-Michel Lasry, Pierre-Louis Lions, Benjamin Moll, *Income and Wealth Distribution in Macroeconomics:A Continuous-Time Approach, 2021, forthcoming, Review of Economic Studies*

Brunnermeier, Markus K., and Yuliy Sannikov, *Macro, Money, and Finance: A Continuous-Time Approach, 2015, online manuscript*

Ljungqvist, Lars and Thomas Sargent, *Recursive Macroeconomic Theory*, Cambridge, MA: MIT Press, 2004

Nancy Stokey and Robert E. Lucas Jr. (collaboration with Edward Prescott), *Recursive Methods in Economic Dynamics*, Harvard Univ. Press, 1989

Marimon, Ramon and Andrew Scott (Eds.), *Computational Methods for the Study of Dynamic Economies*, Oxford: Oxford University Press, 1999, ISBN: 0-19-829497-2.

Mario J. Miranda and Paul L. Fackler, *Applied Computational Economics and Finance*, MIT Press, 2002

Judd, Kenneth, *Numerical Methods in Economics*, Cambridge, MA: MIT Press, 1998

Thomas Sargent, *Dynamic Macroeconomic Theory*, Harvard Univ. Press, 1987

David Romer, *Advanced Macroeconomics*, Mc-Graw Hill, New York, 2012, 4th edition

George W. Evans and Seppo Honkapohja *Learning and Expectations in Macroeconomics*, 2001 by Princeton University Press

Brunnermeier, M. K. and Sannikov, Y. (2014): "A macroeconomic model with a financial sector," *American Economic Review*, 104(2):379{421.

Moll, Benjamin, SeHyoun Ahn, Greg Kaplan and Tom Winberry (2016): No More Excuses! A Toolbox for Solving Heterogeneous Agent Models with Aggregate Shocks, mimeo, Princeton University and Matlab routines.

Marcet, Capuzzo-Dolcetta, I., and P. L. Lions (1990): "Hamilton-Jacobi Equations with State Constraints,"*Transactions of the American Mathematical Society*, 318, 643-683.

Crandall, M. G., and P. L. Lions (1983): "Viscosity Solutions of Hamilton-Jacobi Equations," *Transactions of the American Mathematical Society*, 277, 1-42.

Albert and Ramon Marimon, 2019, *Recursive Contracts*, 87, 1589-1631.

5. Further information about assessment

Examination(s)	Oral exam and assignments
Date:	See plan of semester
Length:	-
Structure:	Pass/Fail