

## SYLLABUS

Course title	Code
Advanced Macroeconomics	

Staff	Department
<b>Coordinator:</b> Benjamin Hemingway	Faculty of Economics and Business Administration

Study cycle	Course type
Third (Ph.D.)	Compulsory

Form of implementation	Period of implementation	Language of instruction
Face-to-face/Remote	Spring Semester	English

Requirements for student	
<b>Prerequisites:</b>	<b>Additional requirements (if any):</b>

Number of ECTS credits	Student's workload	Contact hours	Individual work
6	168	24	144

Purpose of the course
<p>This course aims to provide the state-of-the-art theoretical foundations of macroeconomics. Specifically, macroeconomic dynamic stochastic general equilibrium (DSGE) models will be introduced. Not only will the course cover how to derive those equilibrium models but also how to solve and implement them using numerical methods and computer software.</p> <p>The first part of the course deals with the simplest kind of general equilibrium models: representative agent, representative firm models, i.e. fully homogeneous models. These models are not micro-founded. This part of the course will also introduce students to the financial market view of macroeconomic general equilibrium models and thus discusses some special finance models in the area of asset pricing. The computer software introduced is called Dynare and with it an implementation of so-called perturbation methods.</p> <p>The second part of the course leaves this simple, fully homogeneous model world and introduces agent and firm heterogeneity. Moreover, these general equilibrium models will be micro-founded ones. Specifically, New Keynesian models are first introduced and with them a role for monetary policy, heterogeneous firms, and price rigidities. Next, heterogeneous agent models are introduced and additional heterogeneous firm models are discussed. Value function iterations and dynamic programming using the computer software Matlab are the key numerical methods introduced in this part of the course.</p>

Course themes	Contact / Individual work: time and assignments								Assignments
	Lectures	Tutorials	Seminars	Practical classes	Laboratory work	Practice	Contact hours	Individual work	
<b>First Part (Basic Optimization and Equilibrium Theory and DSGE Modelling)</b>									
Review of optimization theory and expected utility theory	2						2	12	
Pareto efficiency, social planner equilibrium, competitive equilibrium, Arrow-Debreu securities, and welfare theorems	2						2	12	
Basic DSGE models	4						4	24	
Introduction to perturbation methods	2						2	12	
Introduction to Dynare and perturbation methods	2						2	12	
<b>Second Part (New Keynesian and Heterogeneous Agent DSGE Models)</b>									
New Keynesian models	4						4	24	
Introduction to dynamic programming	2						2	12	
Introduction to Matlab, implementation of value function iteration	2						2	12	
Bewley/Aiyagari model, an incomplete market, heterogeneous agent model	2						2	12	
Heterogeneous firm models	2						2	12	
<b>Total</b>	<b>24</b>						<b>24</b>	<b>144</b>	

Assessment strategy	Share in %	Time of assessment	Assessment criteria
First part of the course examined by take-home exam.	50	The take-home exam will be handed out after all lectures (first and second part) have been delivered and students will get ~2-3 weeks of time to solve it.	The take-home exam consists of questions asking to derive new equilibrium conditions in DSGE models, which are (small) extensions of the models discussed in class, to implement these new models in Dynare by modifying the basic DSGE model code discussed in class and available to students, and to discuss the economic implications of the new features of the model.
Second part of the course examined by take-home exam.	50	The take-home exam will be handed out after all lectures (first and second part) have been delivered and students will get ~2-3 weeks of time to solve it.	The take-home exam consists of questions asking to derive new equilibrium conditions in DSGE models, which are (small) extensions of the models discussed in class, to implement these new models in Matlab by modifying the basic value function iteration code discussed in class and available to students, and to discuss the economic implications of the new features of the model.

Author	Published in	Title	Issue No. or Volume	Publishing house or Internet site
<b>Literature for First Part (Basic DSGE Modelling and Asset Pricing)</b>				
<b>Suggested Reading</b>				
Dirk Krueger	2012	Macroeconomic Theory	---	<a href="https://www.ssc.wisc.edu/~aseshadr/econ714/MacroTheory.pdf">https://www.ssc.wisc.edu/~aseshadr/econ714/MacroTheory.pdf</a>
Steve Williamson	1999	Notes on Macroeconomic Theory	---	<a href="http://www.econ.yale.edu/smith/econ510a/notes99.pdf">http://www.econ.yale.edu/smith/econ510a/notes99.pdf</a>
David Romer	2011	Advanced Macroeconomics	4th Edition	McGraw-Hill
Tommaso Mancini Griffoli	2013	Dynare User Guide	Version 4	<a href="http://www.dynare.org/documentation-and-support/user-guide">http://www.dynare.org/documentation-and-support/user-guide</a>
Dynare Team	1996-2017	Dynare Reference Manual	Version 4.5.4	<a href="http://www.dynare.org/documentation-and-support/manual">http://www.dynare.org/documentation-and-support/manual</a>
<b>Literature for Second Part (New Keynesian and Heterogenous Agent DSGE Models)</b>				
<b>Required reading (text books, lecture notes, and public online sources)</b>				
Jianjun Miao	2014	Economic Dynamics in Discrete Time	1st Edition	MIT Press
Jordi Galí	2008	Monetary Policy, Inflation and the Business Cycle	1st Edition	Princeton University Press
<b>Required reading (articles)</b>				
Sudhakar Rao Aiyagari	1994	Uninsured Idiosyncratic Risk and Aggregate Saving	Vol. 109 No.3 pp. 659-684	The Quarterly Journal of Economics
Hugo Hopenhayn	1992	Entry, Exit, and Firm Dynamics in Long Run Equilibrium	Vol. 60 No. 5 pp. 1127-1150	Econometrica
Hugo Hopenhayn and Richard Rogerson	1993	Job Turnover and Policy Evaluation A General Equilibrium Analysis	Vol. 101 No.5 pp. 915-938	Journal of Political Economy
<b>Supplementary Reading</b>				
Burkhard Heer and Alfred Maussner	2009	Dynamic General Equilibrium Modeling – Computational Methods and Applications	2nd Edition	Springer