

School of Social Sciences, University of Surrey

September 8th - September 12th, 2025

Online Macroeconomics Summer School:

Foundations of DSGE Macro Modelling



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1 Introduction

The Centre for International Macroeconomic Studies (CIMS) in the School of Social Sciences, University of Surrey will hold an online summer course, September 8th - September 12th 2025.

The five days will consist of a foundations course aimed at early researchers with some knowledge of Real Business Cycle (RBC) or Dynamic Stochastic General Equilibrium (DSGE) macroeconomic models, but little or no experience of Dynare. This course assumes a basic knowledge of Matlab and will begin with the basics of Dynare and proceed to the construction, in stages, of a closed economy New Keynesian (NK) DSGE model. It will then progress to the estimation of the model by Bayesian methods and finish by showing how the model can be used to study optimal monetary policy and an open NK DSGE model.

Given the very successful experience of the previous years we have decided to keep the online format for the summer school. This enables many participants to attend from all over the world without the need to travel. The course will be conducted using the Team meeting platform. The university and the lecturers have extensive experience with online teaching and have state-of-the-art systems to do so as well as being able to deliver highly interactive lectures. Though we will do our best to record all the sessions, we are expecting participants to attend them live to enable them to interact with lectures and ask questions. Participants will be sent computer codes, lecture notes, and slides ahead of time. Participants will also receive direct assistance before the Summer school starts in order to set up all the systems ahead of the online events.

2 Instructors

Leilane Cambara obtained her PhD in Economics at the University of Surrey this year, from where she also obtained an MRes. She also holds an MSc in Economics from the Federal University of Santa Catarina, a BSc in Economics from the University of Southern Santa Catarina, and a BSc in Business Administration from the Rio de Janeiro state University in Brazil. Her research interests are in international macroeconomics and finance. Her current research includes foreign portfolio investment and the design of optimal foreign exchange rate policy for open emerging economies.

Francesco Fusari is a Lecturer at Newcastle University Business School. He completed his PhD in Economics at the University of Surrey in 2024. Prior to that, he obtained an MSc from the University of Modena and Reggio Emilia and a BSc from the University of L'Aquila. His research focuses on macroeconometrics and applied macroeconomics.

Paul Levine is a Professor in the School of Social Sciences at the University of Surrey. He received a first-class BSc and a PhD, both in Mathematics, from the University of Manchester and an MSc in economics (distinction) at Queen Mary, London. In 1984 he became a senior research officer at the Centre for Economic Forecasting, London Business School and was appointed Professor of Economics at the University of Leicester in 1989. In 1994 he moved to the University of Surrey. He has acted as a consultant and/or visiting researcher at the IMF, the ECB, the central banks of Peru and Nigeria, and the World Bank. His main research is on the use of empirically-based DSGE models for the study of macroeconomic policy. He has published over 100 refereed articles or chapters and two books. For further details of publications see IDEAS-RePEc.

Alistair Macaulay is a Surrey Future Fellow in the School of Social Sciences at the University of Surrey. He obtained a PhD from the University of Oxford in 2021, then continued at Oxford as the Biegun-Warburg Junior Research Fellow in Economics, before joining the University of Surrey in 2023. His research interests are in the roles of information and inequality in macroeconomics. His current research projects are focused around the role of news media in macroeconomic dynamics. For further details, please see <https://sites.google.com/site/alistairmacaulayecon>

Joe Marlow is a PhD student at the University of Surrey, focusing on macroeconometrics. He earned his BSc and MRes from the University of Surrey, and also holds a MSc in Economics from the University of St Andrews.

Ricardo Nunes is a professor and co-Director of the Centre of International Macroeconomic Studies at the University of Surrey. He obtained a PhD from Universitat Pompeu Fabra in 2007. He joined the Board of Governors of the Federal Reserve System in 2007, where he worked as an economist and senior economist. In 2014 he moved to the Federal Reserve Bank of Boston working as a senior economist and policy advisor. He was also a visiting researcher at the Bank of Portugal and the IMF. In 2018 and 2019 he worked at the Council of Economic Advisers to the Chancellor of the Exchequer. His main research is on monetary and fiscal policy. He has published in these areas in journals such as the Quarterly Journal of Economics, Journal of Political Economy, Journal of Monetary Economics, Journal of Economic Theory, Journal of European Economic Association, among others. For further details of publications see <https://sites.google.com/view/ricardonunes/home>

Luciano Rispoli received his undergraduate degree in Economics in 2009 from Bocconi University. During his undergraduate degree he spent 6 months as an exchange student at the Australian National University. He then obtained a MSc in International Economics and Finance with distinction from the University of Sheffield in 2011. He then pursued his doctoral studies at Birkbeck College - University of London where he also worked as a Teaching Assistant and sessional Associate Lecturer. In 2016 he joined the University of Warwick as a Teaching Fellow where he taught Monetary Economics (MSc) and undergraduate micro and macroeconomics. In 2019 he joined the School of Social Sciences at Surrey University where he currently teaches Quantitative methods (BSc), Corporate finance (BSc) and Financial Econometrics (MSc). His research fields are macroeconometrics and monetary policy.

Kirill Shakhnov is a Senior Lecturer in the School of Social Sciences at the University of Surrey. In 2015, he completed his Ph.D. in Economics at European University Institute, Italy. He then held the Foscolo Europe Fellowship position at the Einaudi Institute for Economics and Finance and taught at LUISS University, before being appointed as a Lecturer at the University of Surrey in 2019. Kirill's primary research interests lie in the fields of international macroeconomics with a focus on sovereign bond markets and cryptocurrencies. The

research is organized around three related topics: asset pricing of internationally traded assets, public finance, and the sources of macroeconomic fluctuations. For further details, please see <https://sites.google.com/site/kshakhnov>

Jonathan Swarbrick is a Lecturer in Economics at the University of St Andrews and an external economist at the Bank of Canada. He originally studied Aerospace Engineering at Surrey, graduating in 2005, before switching to Economics in 2010. He completed an MSc and PhD in Economics at Surrey, finishing his doctorate in 2017. Jonathan joined the Bank of Canada in 2017 as a Senior Economist in a modelling team, where he worked for four years before returning to the UK in 2021 to take up his position at St Andrews. He has also held trainee roles at the Bank of England and the European Central Bank and continues to work with the Bank of Canada on modelling projects. His research focuses on macroeconomic theory, covering monetary policy, macro-financial linkages, small open economies, and macro-labour. His work has been published in the Journal of Money, Credit and Banking, Journal of Economic Dynamics and Control, International Journal of Central Banking, Macroeconomic Dynamics, The B.E. Journal of Macroeconomics, and Economics Letters. For further information, see his website at <https://www.jonathanswarbrick.uk>.

Alessio Volpicella is an Associate Professor of Economics at the University of Pavia, Italy and a member of the Centre of International Macroeconomic Studies (CIMS) at the University of Surrey. In 2020 he received a PhD in Economics from Queen Mary University of London. He joined the University of Surrey in 2020, where he worked as a Lecturer and Senior Lecturer. He has also collaborated with the European Central Bank (ECB), the Bank of England, BNP Paribas, the Department of Business and Trade and LSE Consulting. His main research is on time series econometrics, macroeconometrics and Bayesian econometrics. He has published in these areas in journals such as the Journal of Business Economic & Statistics and Quantitative Economics.

Aliaksandr Zaretski is a Lecturer in Economics at the University of Surrey. He has a PhD in Economics from Emory University (2022) and an MSc in Economics and Finance from CEMFI (2016). Before joining the University of Surrey in August 2022, he worked as a research assistant at the Federal Reserve Bank of Atlanta. His research interests are in macroeconomic theory, especially in relation to optimal macroprudential and monetary policy, international finance,

and numerical methods in economics.

3 Course Timetable (BST)

09.30 am - 11.00 am: Session 1

11.00 am - 11.30 am: Break

11.30 am - 01.00 pm: Session 2

01.00 pm - 02.15 pm: Lunch

02.15 pm - 03.45 pm: Session 3

03.45 pm - 04.15 pm: Break

04.15 pm - 05.45pm : Session 4

4 Course Contents

This Course is aimed at those with some knowledge of RBC and NK models but little or no experience of setting them up in Dynare. The contents of lectures over the five days are as follows:

- **Day 1: Dynare Basics and the RBC Model**

Instructor: Shakhnov, Zaretski

- Introduction to the 5-Day Course
- Dynare Basics
- RBC Model
- Calibration and Use of an External Steady State
- Linearisation
- Exercises in Lab (all day)

- **Day 2: The New Keynesian Model, Stability and Global Sensitivity Analysis**

Instructor: Macaulay, Nunes, Swarbrick

- The New Keynesian (NK) Model
- Stability-Indeterminacy

- Introduction to the Global Sensitivity Analysis toolbox in Dynare
- Exercises in Lab (all day)

- **Day 3: Bayesian Estimation of the NK Model**

Instructor: Rispoli, Volpicella, Marlow

- Preparing the Data including use of various filters
- An Introduction to Bayesian Methodology
- Identification and Pre-estimation Checks
- Direct Linear Estimation of the Non-Linear NK Model
- Exercises in Lab (all day)

- **Day 4: Empirical Identification of Macroeconomic Shocks**

Instructor: Vopicella, Fusari

- Overview of the Identification Problem in Structural Vector Autoregressions (SVARs)
- (Some) Classic Solutions
- Estimation and Inference for set-identified SVARs
- Proxy SVARs
- Local Projections
- Exercises in Lab (all day)

- **Day 5: A Workhorse New Keynesian Small Open Economy (NK SOE) Model**

Instructor: Cambara, Levine

- Construction of the NK SOE Model
- Bayesian Estimation and validation of two-bloc SOE-Rest of the World model
- Policy using Monetary and Foreign Exchange Intervention Taylor-Type Rules
- Exercises in Lab (all day)