

Syllabus

[cmcd.economia@fgv.br]

Course Name: Quantitative Methods in Macroeconomics

Faculty:

2026 SECOND SEMESTER

COURSE OUTLINE

- Basic principles of computing and programming
- Solving nonlinear systems
- approximation of stochastic processes, function approximation methods
- Global approximation techniques (value and policy function iterations)
- Methods for models of heterogeneous households and heterogeneous firms
- Continuous time models

COURSE PROGRAM

There are three main goals of this course. The first is to develop your skills at formulating and analysing recursive competitive equilibrium models that feature heterogeneity and frictions. The second is to introduce you to tools to solve and simulate them. The final goal is to expose you to some of the issues and problems that these rich models have been used to address.

The topics covered include solving non-linear system of equations, approximation of stochastic processes, function approximation techniques, and Monte Carlo simulations. We will introduce students to value and policy function iterations, and methods for models with heterogeneous agents and continuous time.

BIBLIOGRAPHY

Teaching material and reading: There is no main textbook for the course. The students are given necessary lecture notes/handouts, as well as some computing toolboxes (Codes, etc.) for implementing the computational methods covered. This material is also supplemented with a reading list of various papers and chapters from books.

Some useful books:

- Adda, J. and R. Cooper, (2003). "Dynamic Economics", MIT Press;
- Heer and Maussner (2005). "Dynamic General Equilibrium Modelling: Computational Methods and Applications", Springer;

- *Judd, K. (1998). “Numerical Methods in Economics”, MIT Press;
- Ljungvist, L. and Sargent, T.J. (2000). “Recursive Macroeconomic Theory”, MIT Press;
- Marimon, R. and Scott, A. (1998). “Computational Methods for the Study of Dynamic Economies”, Oxford University Press;
- *Miao, J. (2014). “Economic Dynamics in Discrete Time”, MIT Press;
- Miranda, M.J. and Fackler, P.L. (2002). “Applied Computational Economics and Finance”, MIT Press;
- Stokey, N. and R. Lucas, (1989). “Recursive Methods in Economic Dynamics’ Harvard University Press.

GRADING

The grade will be based on four problem sets (70%) and an exam (30%).

CONTACT

Professor: (please use this email to communicate with me)

Teaching Assistant: TBA – (TA session time to be announced)