

12M007

3 ECTS

Computational Methods

Overview and Objectives

In the course we discuss numerical techniques for solving dynamic models that are common in macroeconomics and finance. This includes dynamic programming to solve general dynamic optimization problems. Furthermore, we treat approximations around the steady state to solve business cycle models. The programming language used in the course will be Matlab. To solve business cycle models, we will also make use of a software toolkit that I provide.

Course Outline

DYNAMIC PROGRAMMING:

Some theory and applications to models of

- consumption and saving
- dynamic labor supply
- firm dynamics under financing constraints.

STOCHASTIC DYNAMIC ECONOMIC MODELS:

- Computing the deterministic steady state
- Solving models by linearization around the steady state
- Simulating and analyzing models

Applications:

- Basic RBC model
- RBC model with labor market frictions
- Basic New Keynesian model
- Unemployment in New Keynesian models

12M007

3 ECTS

Computational Methods

Required Activities

Evaluation

Grades will be determined by a homework (20%) and a small personalized project (80%) which implies solving an interesting economic model (for example, replicating the results of a published paper) and interpreting the results.

Materials

Books:

Brandimarte, P.: "Numerical Methods in Finance: a Matlab-Based Introduction", New York: John Wiley & Sons.

Judd, K.L., "Numerical Methods in Economics", Cambridge and London: MIT Press.

Miranda, M.J. and P.L. Fackler, Applied Computational Economics and Finance"MIT Press.

George McCandless "The ABCs of RBCs: An Introduction to Dynamic Macroeconomic Models" Harvard University Press

A list of articles will be handed out in class.