Economics 219 – Readings in Macroeconomics Spring 2003-04
Prof. Garey Ramey

Computational Methods in Macroeconomics

Overview

This course will cover numerical analysis of dynamic macroeconomic models. The course will consist of assigned course notes, assigned homework, a computational project, and a final exam. The grade will be based on participation (25%), the computational project (25%) and the final (50%). At the end of the course, the course notes, homework assignments and computer code will be edited and assembled into a reference handbook.

Required Textbooks

Miranda and Fackler, *Applied Computational Economics and Finance*, MIT Press, 2002

Marimon and Scott, eds., *Computational Methods for the Study of Dynamic Economies*, Oxford Univ. Press, 2001

Recommended Textbooks

Stokey and Lucas, *Recursive Methods in Economic Dynamics*, Harvard Univ. Press, 1989

Judd, *Numerical Methods in Economics*, MIT Press, 1998

Course Topics

1. Numerical Techniques

- Numerical optimization
- Approximation
- Numerical integration

2. Dynamic Programming

- Existence and uniqueness of optima
- Principle of optimality
- Stochastic dynamic programming

3. Solution by Linearization

- Linear systems: stability, multiple solutions, convergence

- Linear quadratic approximation
- Linearized first-order conditions

4. Nonlinear Solution Methods

- Discrete state space methods
- Simulation PEA method
- Projection methods
- Perturbation methods

5. Further Issues and Applications

- Uninsurable endowment risks
- Enforceability constraints