

Instructor: Munechika Katayama  
Office: 2122 Patrick F. Taylor Hall  
Office Hours: TTH 1:00 – 3:00 and by appointment  
Phone: 578-3790  
Email: [mkatayama@lsu.edu](mailto:mkatayama@lsu.edu)

Class Room: 2171 Patrick F. Taylor HallWalsh2010  
Class Time: 09:10 – 10:30 TTH  
Class Web Page: <http://moodle.lsu.edu/>

### Course Description

In this course, we study a class of models called dynamic stochastic general equilibrium (DSGE) models, which are now workhorse models in macroeconomics. We will use DSGE models to study issues in short-run business cycle fluctuations and will cover necessary techniques to deal with DSGE models.

### Prerequisite

Econ 7710, 7715, and 7735

### Required Text

There is no required textbook in this course. Readings come from a variety of sources and are outlined in this syllabus. However, the following books are useful resources in the literature.

Canova (2007): *Methods for Applied Macroeconomic Research*. Princeton University Press.

DeJong and Dave (2011): *Structural Macroeconometrics*. Princeton University Press.

Galí (2008): *Monetary Policy, inflation, and the Business Cycle: An Introduction to the New Keynesian Framework*. Princeton University Press.

Walsh (2010): *Monetary Theory and Policy*. MIT press.

Woodford (2003): *Interest and Prices*. Princeton University Press.

### Attendance

As a grad student, you are always supposed to come to class.

### Grading

Your grade will be determined based on your performance on problem sets, a class presentation, and a final project. No exam will be given in this course. You are encouraged to work as a group to do homework in order to have better understanding of materials. However, you must submit your *own* answers to each problem set. Working together does not mean copying from someone's. Problem sets involve a certain amount of coding. You are supposed to turn in everything necessary to reproduce your results.

At the end of semester, each student will present and discuss a paper that is related to the class material. The final project is to replicate a DSGE paper, which can be different from the one you will present.

## Topics to be Covered

1. Introduction
  - (a) Background of DSGE Models
  - (b) Lucas Critique
  - (c) MATLAB and Numerical Optimization
2. The Benchmark Real-Business Cycle Model (King and Rebelo, 1999)
  - (a) The First Order Conditions
  - (b) Solving for the Steady State Values
  - (c) Economic Mechanism behind the RBC
    - i. Intertemporal Substitution of Labor
    - ii. Intertemporal Substitution of Consumption
  - (d) Log-linearization and Detrending
    - i. Linear/Quadratic/Cubic Trend
    - ii. Hodrick-Prescott Filter (Hodrick and Prescott, 1997)
    - iii. Band Pass Filter (Baxter and King, 1999; Christiano and Fitzgerald, 2003)
  - (e) Calibration
3. Solution Methods
  - (a) Blanchard and Kahn (1980)
  - (b) Christiano (1991, 2002); Uhlig (1999) – Method of Undetermined Coefficients
  - (c) Klein (2000) and Sims (2001) – Generalized Schur Decomposition
  - (d) Schmitt-Grohé and Uribe (2004) – Perturbation Method
  - (e) Impulse Response Functions
4. Shortcomings of the Benchmark RBC Model
  - (a) Productivity and Hours
  - (b) Propagation
5. Take the Model to the Data
  - (a) GMM
  - (b) Maximum Likelihood Estimation and the Kalman Filter (Hamilton, 1994a; Hamilton, 1994b, Ch.5 and 13; Ireland, 2004; Canova, 2007, pp.212-240; DeJong and Dave, 2011, Ch.8, 13)
6. Model of Imperfect Competition
7. Other Shocks?
  - (a) Government Spending Shock (Christiano and Eichenbaum, 1992)
  - (b) Investment-specific Technology Shock (Greenwood, Hercowitz, and Krusell, 2000)
  - (c) Oil Shock (Kim and Loungani, 1991; Finn, 2000)
  - (d) Monetary Policy Shock
8. Money and the Business Cycle
  - (a) Cash in Advance

- (b) Money in Utility
- (c) Sticky Prices
  - i. Some Stylized Facts about Prices (Taylor, 1999)
  - ii. Calvo pricing (Calvo, 1983)
  - iii. Adjustment Cost (Rotemberg, 1982; Ireland, 2001)
- 9. New Keynesian Models (Clarida, Galí, and Gertler, 1999; Galí, 2008)
  - (a) Dynamic IS Relation
  - (b) New Keynesian Phillips Curve
- 10. More Frictions?
  - (a) Wage Rigidity
  - (b) Information Rigidity
  - (c) Smets and Wouters (2003)
  - (d) Christiano, Eichenbaum, and Evans (2005)
- 11. Monetary Policy
  - (a) Time Consistency Problem
  - (b) Optimal Monetary Policy
- 12. Students' Presentations

The above course outline is a basic plan for this course and may be subject to changes depending on progress.

## References

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