Econ 210A: Macroeconomic Theory I

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University of California, San Diego - Fall 2010
Mon-Wed, 9:30am-10:50am, Econ 300

Syllabus - Version 1.2

Description of the Course

The objective of this course is to get you acquainted with the techniques that researchers use to develop and study models of dynamic aggregate economies. At the center stage of the class we will place the Neoclassical Growth Model. We will use such framework to apply the dynamic techniques that we learn, to formulate theoretical answers to important macroeconomic questions and to understand the implications that the theory has for econometric practice. The focus of the class will be in developing skills for writing and analyzing theoretical models to discuss important economic issues with the discipline and the insight offered by economic theory in general equilibrium.

Course Organization

I will hold the lectures on Mondays and Wednesdays from 9:30am to 10:50am in Econ 300. Myungkyu (our TA) will hold a discussion session of one hour on Fridays from 8:00am to 9:00am in Econ 300. I will hold office hours on *Mondays* in Econ 306 from 2pm to 3:30pm. If you have questions/comments/doubts, you are strongly encouraged to stop by. If you cannot make it at the scheduled time, I will be happy to set up an appointment at a time convenient for both of us.

I will periodically assign problem sets on the material covered in class. I strongly encourage you to work in study groups on the assignments; however, the responsibility for the content of the homework remains individual and I expect you to turn in your own version of the answer. I will announce in class and by email when each assignment is due. Late assignments will not be accepted. Of the n problem sets assigned, only $n-1$ will count towards your final grade; the one with the lowest grade will be dropped.

There will be two exams in the quarter: a midterm exam and a final exam. The tentative dates are as follows

- Midterm Exam, Friday October 29^{th} from 2pm to 5pm.
- Final Exam, Wednesday December 8^{th} from 8am to 11am.

Your final grade in the class will be determined as a weighted average of your grade in the problem sets (20%), your grade in the midterm (40%) and your grade in the final exam (40%).

Textbooks and Lecture Notes

The main textbook for the class is Ljungqvist and Sargent, *Recursive Macroeconomic Theory*, 2nd edition, MIT press, 2004. Most of the material covered in class can be found in this textbook in one form or another. In the exposition of a good part of the material I will follow closely Rody Manuelli's *Lectures Notes on Discrete Time Economics: The Growth Model*. You can download these notes at *http://dss.ucsd.edu/ grondina/personalTeaching/LectureNotesManuelli.pdf*. In the last part of the class I will instead follow the exposition in Stockey and Lucas (1989), *Recursive Methods in Economic Dynamics*, Harvard University Press, 1989. In addition, references about specific topics will be provided during the lectures and posted in the class website. The class website can be found at http://dss.ucsd.edu/ grondina/personalTeaching.

Course Outline

1. **Dynamic Methods (I)**
   (a) Convex Analysis and the Kuhn-Tucker Theorem
   (b) A Two-Period Economy
   (c) Finite and Infinite Horizons
2. **The Neo-Classical Growth Model: A Planner's Perspective**
   (a) The One-Sector Growth Model (the Ramsey-Cass-Koopmans model)
   (b) Steady State Analysis
   (c) Dynamic Analysis
      i. Permanent Shocks
      ii. Temporary Shocks
   (d) Applications
      i. Constant Saving Rate (the Solow model)
      ii. Population Growth and Technological Change
3. **The Neo-Classical Growth Model: Competitive Equilibrium**
   (a) Competitive Markets and Recursive Competitive Equilibrium
   (b) Equivalence of Competitive Equilibrium and the Planner's Problem
   (c) Applications
      i. Human Capital and Growth
      ii. Habit Persistence
   (d) Taxes and Growth
      i. Non-distortionary Taxes and the Ricardian Equivalence
      ii. Distortionary Taxes: Steady State Analysis
   (e) Heterogeneity and Aggregation

4. **Dynamic Methods (II)**

   (a) Mathematical Preliminaries

      i. Complete Metric Spaces.

      ii. The Contraction Mapping Theorem and Blackwell's Sufficient Conditions.

      iii. The Theorem of the Maximum.

   (b) Dynamic Programming

      i. Existence of a Value Function: the Principle of Optimality.

      ii. Characterization of a Value Function: Monotonicity, Concavity and Differentiability.

      iii. Euler Equations and Transversality Conditions in the Recursive Approach.

      iv. Stochastic Dynamic Programming.

   (c) Applications (if time allows)