Economics 756: Applied Theory II: Intertemporal Economics  
Syllabus UNCG Fall 2009

Stephen Holland, Room 465, Bryan Building  
Email: sphollan@uncg.edu, Telephone: 334-4925,  
Office Hours: Wed. 2-4 or by appointment or open door

Course Location and Times: Tuesday & Thursday 3:45-5:30 from August 25 to  
October 9 in Bryan 213.

Special dates: Midterm exam, (9/25-9/27); Final exam, 10/8; Project due, 10/14.

Course requirements:  
Success in ECO 756 requires completion of several problem sets (10%), several  
classroom presentations (10%), a midterm exam (25%), a final exam (30%), and a  
dynamic project or literature review (25%). Your grade in the course will be based on  
these weights.

The problem sets will require you to solve dynamic optimization problems both  
analytically and numerically. For the numerical analysis, use of Excel, Stata, or some  
other computer tools will be required.

The short classroom presentations will be based on articles in the reading list. The  
goal of your presentation is that everyone in the class should be able to answer questions  
such as: “What is Samuelson’s 1937 paper about?” You should prepare a one page  
handout to share with the class.

The dynamic project is designed to give you experience developing a dynamic  
model, analyzing the model (using analytic and numerical techniques), and describing the  
dynamic solution. Choose a topic of economic interest with a dynamic aspect for the  
project. Please stop by my office to discuss your topic. The finished product from the  
project will be a written report (approximately four pages plus figures) describing the  
model and the analytic and numerical characterization of the solution of the model.  
Ideally, the written report would be the first draft of the “Model” section of a paper for  
your dissertation.

The literature review is designed to give you experience exploring the frontier of  
economic research on a topic, and categorizing, organizing, and describing that research.  
The literature review should describe all the relevant research (published and  
unpublished) on an economic topic, possibly a narrow aspect of one of the topics covered  
in the course. Please stop by to discuss your choice of topic. The literature review must  
be less than four pages, plus a separate bibliography. Ideally, the literature review would  
be the first draft of part of the introduction of a paper for your dissertation.
Texts:
Mas-Colell, Whinston, and Green. (MWG) *Microeconomic Theory*

Adda, Jerome and Russel Cooper. *Dynamic Economics.* ($38)
Chapters 1-3 will be our primary resource for dynamic programming.

Additional Primary Resources:
Chapters 7 to 10.
Conrad and Clark *Natural Resource Economics: Notes and Problems*
Standard resources text on dynamic problems.
Varian, Hal. *Microeconomic Analysis*
Chap. 19 has useful introduction to intertemporal optimization and dynamic programming. Discusses extending the general equilibrium framework temporally. Chap 20 discusses asset markets.

Additional Secondary Resources:
First chapters recommended. Problem sets.
Chap 1-4 is a very high level introduction to dynamic programming. Section 10.7 and 13.8 present a search model.
Varian, Hal. *Intermediate Microeconomics*
Chap 10 discusses intertemporal choice, i.e., extension of usual equilibrium framework. Discusses present value, interest rates, and bonds. Chap 11 discusses assets.
Azariadis, *Intertemporal Macroeconomics*
Topics and Readings:

1) Introduction to dynamic optimization
   a. Chiang Chap 1 (p. 3-23)

2) Economics of intertemporal utility and production
   a. Arrow-Debreu extensions of welfare theorems
      i. Varian Chap 19
      ii. Nicholson Chap 17 (p. 500-523)
      iii. MWG 20.A,B,C,D (p. 732-753)
   b. Overlapping generations failure of welfare theorems
      i. Varian Ch. 19 (p. 365)
      ii. MWG 20.H (p. 769-777)

3) Optimal control theory
   a. Discrete time
      i. Conrad & Clark 1.1 & 1.2 (p. 1-22)
   b. Continuous time & the Maximum principle
      i. Conrad & Clark 1.4 (p. 25-30)
      ii. Chiang 7.1 & 7.2 (p. 161-176)
      iii. Chiang 7.7 (p. 200-204)
   c. Discounting and the current value Hamiltonian
      i. Conrad & Clark 1.5 (p. 31-39)
      ii. Chiang 8.2 (p. 210-214)

4) Dynamic programming
   a. Adda & Cooper Ch. 2 (p. 7-31)
   b. Conrad & Clark 1.3 (p. 22-24)
   c. MWG M.N (p. 968-970)

5) Consumption & Savings
   a. Adda & Cooper Ch. 6 (p. 139-164)

6) Search
   a. Adda & Cooper 10.6 (p. 257-262)

Literature days:

1) Discounting: 9/3
2) Natural resource economics: 9/10
3) Health: 9/17
4) Savings: 9/24
5) Social Security: 10/1
6) Search: 10/6 (?)
Readings:

Discounting

Natural Resource Economics
Savings

Search

Health

Social Security
Feldstein, Martin. “Rethinking Social Insurance” mimeo.
“Privatizing Social Security in the United States—Comparing the Options,” Pages 532-574 Laurence J. Kotlikoff, Kent Smetters and Jan Walliser
“Projected U.S. Demographics and Social Security,” Pages 575-615 Mariacristina De Nardi, Selahattin Imrohoroglu and Thomas J. Sargent
“Is Altruism Important for Understanding the Long-Run Effects of Social Security?,” Pages 616-637 Luisa Fuster
“Privatizing Social Security,” Pages 731-755 Thomas F. Cooley and Jorge Soares

**Human Capital**
Overlapping generations model of human capital.
Analyzes the effect of future demand growth on teacher certification decisions.

**Dynamic Labor Supply**
Formulates and estimates a structural intertemporal model of labor supply.

**Other**