Theory and Application of Dynamic Programming: Household Finance

A. Description
These lectures study decision problems of households and firms in a dynamic stochastic setting. To do so, the course will develop a number of tools and then apply them to the agents' choice problems and equilibrium. A primary tool is dynamic programming. The course will provide the basic foundations for dynamic programming, both in theory and through numerical analysis. Another tool is the use of simulated method of moments to estimate economic models.

After developing these two tools, the course turns to applications. Household dynamic choices will include intertemporal consumption, labor supply, portfolio adjustment and durable expenditures. The role of borrowing constraints will be explored. A theme will be the interaction of discrete and continuous choices.

B. Course Plan

Lecture 1: Overview of Dynamic Programming
- Asset Pricing
- Value Function Iteration
- Simulated Method of Moments

Read:
1. Adda-Cooper, Chpts. 2-5
2. Cooper, R. “Overview of Dynamic Programming,” June 2017 (posted)
Lecture 2: **Household Finance: Portfolio Choice and Borrowing Constraints**

- Household Consumption/ Saving: the Euler Equation
- Household Portfolio Adjustment:
- Borrowing Constraints

Read:

1. Adda-Cooper, Chapt. 6

Lecture 3: **Household Durable Expenditures**

- Continuous Expenditures
- Lumpy Investment
- Borrowing Constraints

Read:
1. Adda-Cooper, Chapt. 7


