Dynamic Optimization

Wuhan Unviersity

Spring, 2020

Instructors: Xiaoxiao Hu and Junmin Liao	Teaching Mode: Online
Duration: February 17 - June 1 (Week 1 - 16)	Class Hours: Monday 9:50 - 12:15

Course Description

This course provides undergraduate students with foundation knowledge in dynamic optimization. Topics include Lagrange's Method, Concave Programming, Uncertainty and Dynamic Programming. Both mathmetical derivation and economic intuition will be emphasized.

Course Materials

- Textbook: Avinash K. Dixit, Optimization in Economic Theory. Oxford University Press, 1990.
- References:
  - Acemoglu, Introduction to Modern Economic Growth. Chapter 6-7.
  - Stokey, Lucas and Prescott, Recursive Methods in Economic Dynamics. Harvard University Press, 1989. Chapter 3-4, 7-9.
- Course Website: https://xhu.github.io/teaching/optimization2020

Assessments

The grade will count the assessments using the following proportions:

- Assignments: 25 %
  - There will be 5 assignments in total. 5 % for each assignment.
- Midterm Exam: 30 % (cancelled)
  - Tentative Date: April 20 (Week 10), in-class
- Final Exam: 45 %
  - Date to be announced later

Schedule

The schedule is tentative and subject to change.

Week 01, 02/17 : Introduction

Week 02, 02/24 : Lagrange's Method

Week 03, 03/02 : Extensions and Generalizations

Week 04, 03/09 : Shadow Prices

Week 05, 03/16 : Maximum Value Functions

Week 06, 03/23 : Convex Sets and Their Separation

Week 07, 03/30 : Concave Programming

Week 08, 04/06 : Second-Order Conditions

Week 09, 04/13 : Second-Order Conditions & Revision

Week 10, 04/20 : Uncertainty

Week 11, 04/27 : Optimal Control

Week 12, 05/04 : Optimal Control

Week 13, 05/11 : Optimal Control

Week 14, 05/18 : Dynamic Programming

Week 15, 05/25 : Dynamic Programming

Week 16, 06/01 : Revision or Final Exam