

ECON-GA 1025 — Macroeconomic Theory I

NYU, Fall 2021

Jaroslav Borovička

Syllabus (first half of the course)

Lecture:	19 W 4th Street, room 517	Mon, Wed 9:30am–11:30am
Office hours:	19 W 4th Street, room 714	by appointment
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TA:	Brandon Gary Kaplowitz	bgek258@nyu.edu
Recitation:	19 W 4th Street, room 517	Fri 12:30pm–2:30am

Lectures and recitations are fully in-person, without Zoom and without recording, unless otherwise noted. Changes in university rules may alter the arrangements outlined in this syllabus during the course of the semester.

1 Course description

The first half of the fall semester is devoted to the study and application of dynamic programming methods in macroeconomic modeling.

2 Course requirements and grading

There will be weekly problem sets. A passing grade requires that these homework problem sets have been handed in. You are encouraged to form study groups of 3–5 people and work on the problem sets and other study material together. However, every student has to hand in his/her own uniquely written assignment.

Your letter grade for the course will be based on a midterm exam and a final exam. Each exam will cover the respective half of the course.

Last class of the first quarter will meet on Monday, October 25. The **midterm exam** will be in class on **Friday, October 29**, during the recitation session.

3 Reading and other material

Main texts:

- Ljungqvist, Lars and Thomas J. Sargent (2018). *Recursive Macroeconomic Theory*. [Ljungqvist and Sargent (2018)] Updated chapters will be provided electronically.
- Stokey, Nancy L. and Lucas, Robert E. and Prescott, Edward C. (1989). *Recursive Methods in Economic Dynamics*. [Stokey, Lucas, and Prescott (1989)]

The course involves some coding. Matlab is a convenient and powerful tool but I do not prescribe any particular programming language. The **QuontEcon** website, developed by Tom Sargent, John Stachurski, and their coauthors, is a phenomenal resource that covers numerical implementation of much of what we will cover in Python, so it may be a good idea to invest time into learning it. I will use it to some extent and refer to it but learning Python is not mandatory. If you are interested, I suggest the following.

- **Python Programming for Economics and Finance** is a lecture that provides a clear, step-by-step guide how to install Anaconda, which is a Python implementation interconnected with Jupyter notebooks, together with a simple introduction into Python.
- **Quantitative Economics with Python** and **Advanced Quantitative Economics with Python** are lectures that are relevant for our course, and for many other courses that will follow.

4 Course outline

4.1 Introduction to search theory

- Ljungqvist and Sargent (2018), Chapter 6.1–6.3

4.2 Deterministic dynamic programming

- Stokey, Lucas, and Prescott (1989), Chapters 2–6
- Ljungqvist and Sargent (2018), Chapter 5

4.3 Time series modeling

- Ljungqvist and Sargent (2018), Chapter 2

4.4 Stochastic dynamic programming

- Ljungqvist and Sargent (2018), Chapter 3–5

4.5 Applications of search theory

- Ljungqvist and Sargent (2018), Chapter 6

4.6 Recursive equilibria

- Ljungqvist and Sargent (2018), Chapter 7

4.7 Foundations of asset pricing

- Ljungqvist and Sargent (2018), Chapters 13–14

References

Ljungqvist, Lars, and Thomas J. Sargent, 2018. *Recursive Macroeconomic Theory*, The MIT Press, 4th edn.

Stokey, Nancy L., Robert E. Lucas, and Edward C. Prescott, 1989. *Recursive Methods in Economic Dynamics*, Harvard University Press.