

Introduction to MATLAB

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Summer 2022

Course Description

This is a short introductory course for MATLAB designed for first-year PhD students. Students will learn basics of MATLAB with in-class exercises. The materials covered in this course will be useful not only for first-year macro courses (604/605), but for any research task that requires scientific computations.

Prerequisite: Some knowledge about MATLAB or other programming language will be useful but not required. Students are required to bring their laptops with MATLAB installed from [this page](#) or running [online](#). The license can be obtained with Rutgers NetID.

Course Materials: We will follow [lecture slides](#) closely. Other useful references are the followings.

- Miranda & Fackler (2004). *Applied computational economics and finance*. MIT press
- Greenwood & Ricardo Marto (2022). *Numerical Methods for Macroeconomists*. [\[Link\]](#)
- Prof. Johannes Pfeifer's notes [\[Link\]](#)
- Prof. Thomas Winberry's notes [\[Link\]](#)
- [MATLAB onramp](#) at Mathworks
- [Introduction to Programming with MATLAB](#) by Ledeczi & Fitzpatrick at Coursera

Outline

- Motivation: Why MATLAB?
- MATLAB Interface
- Scalars and Strings
- Arrays and Matrices
 - Exercise 0 - Solving linear system

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- Cell arrays and Structures
- Boolean Statements and Loops
 - Exercise 1 - Bond pricing
 - Exercise 2 - Bond pricing, again
- Scripts and Functions
 - Exercise 3 - Square function
- Plots
 - Exercise 4 - Plotting AR(1) processes
- Debugging
 - Exercise 5 - Finding three errors
- Estimation and Optimization
 - Exercise 6 - Estimation of AR(1)
 - Exercise 7 - Detrending US GDP
 - Exercise 8 - Savings problem