Introduction to MATLAB

Lecturer: Rodolfo Baggio

Language

English

Course description and objectives

The course provides a gentle introduction to the MATLAB computing environment and is intended for beginning users. It is designed to give students a basic understanding of MATLAB by acquiring basic operational skills. The course consists of interactive lectures and sample MATLAB problems given as assignments and discussed in class. Concepts covered include basic use and toolboxes use, graphical representations and tips for designing and implementing MATLAB code.

Upon successful completion of this course, the student should be able to:

- Understand the main features of the MATLAB development environment
- Use the MATLAB GUI effectively
- Design simple algorithms to solve problems
- Write simple programs in MATLAB to solve scientific and mathematical problems
- Know where to find help for advanced usage

Audience

The course is open to all Bocconi students. In particular it is for:

- Undergraduate and Master of Science students with an interest in numerical computing and numerical simulations
- Students who will need MATLAB to prepare their final thesis work

Prerequisites

No prior programming experience or knowledge of MATLAB is assumed.

It is advisable to have a good familiarity with PC operations and a working knowledge of some basic application software (e.g. Excel). Basic knowledge of computer programming and an understanding of matrix and linear algebra and statistics are highly beneficial.

Important notice: The course presents the software MATLAB with its main features; therefore, it does not represent a "substitute" of a formal statistics or econometrics course, therefore the details of any statistical or econometric methods will not be discussed.

Guidelines

Registration:

You can sign up for the course only through the yoU@B student Diary, in the " **sign-up for various activities**" box (please note that the box appears only when registrations open. Before then it will not be visible).

You can only cancel your registration by Diary **no later** than the registration deadline for the course itself. No other ways of cancellation are allowed.

Registration will be confirmed a few days before the start of the course through a message posted in the yoU@B student Diary.

Attendance:

- Attendance of **75% or more** of class hours: obtainment of the **Open Badge**
- Attendance of **less than 25%** of class hours: **Exclusion List**

Duration

14 hours

Teaching mode

This course will be only taught in person. Online mode will not be provided.

Calendar

Lecture	Date	Time	Room
1	Mon 13/04/2026	18.15 - 19.45	InfoAS05
2	Wed 15/04/2026	18.15 - 19.45	InfoAS05
3	Wed 22/04/2026	18.15 - 19.45	InfoAS05
4	Mon 27/04/2026	18.15 - 19.45	InfoAS05
5	Wed 29/04/2026	18.15 - 19.45	InfoAS05
6	Mon 04/05/2026	18.15 - 19.45	InfoAS05
7	Wed 06/05/2026	18.15 - 19.45	InfoAS05

Syllabus of the course

Lecture	Topics	Book reference
1	**MATLAB basics** - The MATLAB environment - Basic computer programming - Variables and constants, operators and simple calculations - Formulas and functions - MATLAB toolboxes *Exercises*	**Ch. 1-2**
2	**Matrices and vectors** - Matrix and linear algebra review - Vectors and matrices in MATLAB - Matrix operations and functions in MATLAB *Exercises*	**Ch. 3**
3	**Computer & MATLAB programming** - Algorithms and structures - MATLAB scripts and functions (m-files) - Simple sequential algorithms - Control structures (if...then, loops) *Exercises*	**Ch. 5 and 6**

Lecture	Topics	Book reference
4	**MATLAB programming** - Reading and writing data, file handling - Personalized functions - MATLAB graphic functions - Toolbox structure *Exercises*	**Ch. 7**
5	**Numerical simulations** - Numerical methods and simulations - Random number generation - Monte_Carlo_methods *Exercises*	**Wikipedia** **MATLAB help**
6	**Simulations and Optimization** - Numerical simulations - Simple optimization problems *Exercises*	**Wikipedia** **MATLAB help**
7	**General review & Hands-on session** Interactive hands-on-session where the class will develop one or more MATLAB scripts that solve an assigned problem **Final exercise**	

Software used

Matlab R2024b

Suggested bibliography

- MATLAB Primer
  it.mathworks.com/help/pdf_doc/matlab/index.html
  and choose "Matlab primer"
- Wikipedia
  en.wikipedia.org/wiki/Monte_Carlo_method
- MATLAB help and User's Guide
  www.mathworks.com/help/matlab/index.html
- Statistics Toolbox, Random Number Generation Functions
  www.mathworks.com/help/stats/random-number-generation.html

Useful references:

- MATLAB: more documentation
  it.mathworks.com/help/pdf_doc/matlab/index.html
- MATLAB Central (script, toolbox, blog, newsgroup)
  www.mathworks.com/matlabcentral/

Available seats

This activity is limited to **110** participants. Registrations cannot be carried out once this number has been reached or after closing of the registration period.