Introduction to MATLAB/Octave

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This course provides an introduction to the MATLAB computing environment and is designed to give students a fundamental understanding of programming with MATLAB. It consists of interactive lectures and hands-on exercises. While MATLAB will be used in class, students can complete exercises using GNU Octave, a free software with similar functionality. No prior programming experience is required

The main objectives of this course are: *i)* Understanding the MATLAB environment and its capabilities; *ii)* Learning how to manage and visualize data; and *iii)* Writing scripts and functions for basic programming tasks.

Date and Time
June 9 – June 12
Morning: 9:30 AM – 12:30 PM
Afternoon: 2:30 PM – 5:30 PM

Location
Aula D - Lungotevere Dante 376

Course Outline

Monday, June 9 – Introduction, Data Import, and Visualization
- MATLAB environment
- Creating vectors and matrices
- Operations with arrays
- Writing scripts
- Importing data (text files, Excel files, images, variables)
- Plotting 2D and 3D

Tuesday, June 10 – Programming with MATLAB
- For/while loops
- If statements
- Advanced plotting – graphic handles
- Saving data (variables, figures, files)
- Importing multiple files

Wednesday, June 11 – Interpolation, Data Fitting, and Functions
- Writing and using MATLAB functions
- Data interpolation
- Data fitting

Thursday, June 12 – Applications to Students' Research Projects
A hands-on interactive session where students can either develop scripts relevant to their research projects or work on solving assigned problems.