Matlab Level 1

2 ECTS **UJM semester 1**

Course instructor: Prof. Emmanuel Marin
Language of instruction: English

Overview

Matlab is one of the most using and popular programming environment for applied science. This course wants to familiarize the student with MATLAB using concise, practical tutorial that is focused on writing code to learn concepts. Starting from the basics, these lectures cover array-based computing, plotting and working with files, numerical computation formalism, and the primary concepts of approximations.

This Introduction to MATLAB is useful for industry engineers, researchers, and students who are looking for solutions for numerical computation.

Learning outcomes

On successful completion of this course, students should have the skills and knowledge to:

- Create script and function
- Plot 2D and 3D graph
- Save and Read data from files
- Solve a differential system of equation with either initial conditions or conditions at the limits
- Using FFT and IFFT in 1D and 2D
- Using linear and non-linear curve fit
- Interpolate and Extrapolate of data
- Using spline cubic to approximate data

Content

- Basic programming in Matlab.
- Creation of graph
- Import/Export data
- Resolution of differential equation
- Analysis of data: spectrum, approximation by a function, …

Teaching methods

- Practical work: 24 hours
- Project work: 12 hours

Study materials

- Nagar, Sandeep, Introduction to MATLAB for Engineers and Scientists, Springer, 2017
- Paluszek, Michael, Thomas, Stephanie, MATLAB Recipes, Springer

Assumed Knowledge

Evaluation criteria

- Written exam 70%
- Project work 30%