

ANALYS AND MANAGEMENT OF AGRONOMIC, FOOD AND ENVIRONMENTAL DATA IN MATLAB

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Number of CFU 6 CFU	Activities	Lectures	20 hours
		Laboratory	4 hours
		Seminars	2 hours
		Other activities (please indicate the activity)	(hours)

Objectives

The main objective of this course is to code in Matlab in order to write scripts for advanced statistical analysis. The classes will be held in the computer science classroom or on Microsoft Teams.

Learning outcome

It is desirable to have knowledge in Excel, Statistics and Data Analysis. This class is useful for managing big data sets. This course is useful for students involved in projects requiring high skills in data analysis

Topics

Starting exercises in Excel (2 hours). Introduction to Matlab, basic operations with vectors and matrices (2 hours). Read, write and manage multiple files (in different formats), use of advanced functions for the manipulation of big datasets in environmental and food science (4 hours). Analysis of agro-environmental data and implementation of logical functions as IF, FOR, FIND(4 hours). Interpolation methods (2 hours). Calibration methods and validation of mathematical models (2 hours). Parametric optimization, linear fitting functions (2 hours). Elements of graphical visualization in 2D and 3D (4 hours). Multiple linear regression, principal component analysis and partial least-squares regression (PLS) (4 hours).

Evaluation

In the final exam the student will write a script to manage data measured in a laboratory

Recommended readings

Lecture notes and other course materials