

COURSE SYLLABUS

Doctoral course: Programming and big data, 7.5 credit points

Course code:
Reviewed by: RFB
Approved by: RFB
Valid as of:
Version: 1
Reference number:

Education Cycle: Third cycle, doctoral program course
Doctoral program subject: Economics, Business Administration,
Statistics

Purpose:

The goal of the course is to develop the student's knowledge and skills in programming and data visualization. We will introduce the student to Python which is a powerful high-level programming language. After this course the student should be able to manage big data using programming and to analyze it using descriptive and graphical methods.

Intended learning outcomes:

On completion of the course, the students will be able to:

Knowledge and understanding

1. explain fundamental programming concepts.
2. explain different concepts for management of big data.
3. explain different concepts of relational databases.

Skills and abilities

4. construct conditional statements, subroutines and loops.
5. use built-in routines and packages.
6. apply programming solutions for management of big data to deal with advanced issues in economics and/or business administration.
7. create tables and graphs to carry out descriptive analysis and visualization of big data to deal with advanced issues in economics and/or business administration.

Judgment and approach

8. evaluate the limitations and possibilities of different packages and programs used for management, analysis and visualization of big data.
9. analyze big data using descriptive analysis and visualization techniques.

Content

This course develops the students' ability to manage big data and to analyze it using descriptive and graphical methods. The course will contain three major parts described below.

1. A Practical and modern introduction to Python:

This part will introduce Python. We cover fundamental programming concepts where students learn how to develop their own code but also to use libraries and packages for management, descriptive analysis, and visualization of big data. The students will learn important parts of the Python language, packages and libraries that are required for efficient solving a variety of problems.

2. SQL (Structured Query Language)

The second part of the course SQL is introduced. This is a specific programming language created for accessing, retrieving and manipulating data in databases. In this part of the course, students will learn the most important aspects of SQL language. In the end of the course, students will have practical skills in querying and managing data using SQL.

3. Integration of Python and SQL

In the final part we integrate Python with SQL. When analyzing big data it is important to know how to exchange data and analytical results between different programs. The students will learn how to retrieve, manage and analyze data using SQL and Python.

Type of Instruction/Teaching format:

Lectures and lab sessions. The teaching is conducted in English.

Prerequisites:

Admitted to a doctoral program in statistic, economics, or business administration or a related subject of a recognized business school or university.

Examination and grades:

Course assessment consists of:

Group assignments (ILOs: 4, 5,6,7,8,9), representing 3 credits.

Individual assignments (ILOs: 1-9), representing 4.5 credits

Each of these elements must be passed to obtain a pass in the course.

The grades given are pass or fail.

Course evaluation:

A course evaluation will be conducted at the end of the course.

Literature:

Swaroop, C. H. "Byte of Python".

A list of tutorials and articles will be supplied at the course introduction.