

## DTC-GITT-112 Fundamentals of Computer Science

**SEMESTER:** Fall or Spring

**CREDITS:** 7.5 ECTS (5 hrs. per week: 2h Theory + 3h Lab)

**LANGUAGE:** Spanish (slides and exams also in english)

**DEGREES:** GITT (Fall)

### Course overview

The main objective is to learn computer programming. The Python programming language is used during the course in laboratory sessions and during several exams. The course covers basic programming concepts including data types, operators, control statements and functions. In addition, more advanced concepts are also covered, such as graphs and data files (JSON, CSV, Excel...)

### Prerequisites

No prior programming knowledge is required for attending this course.

### Course contents

#### Theory:

1. Introduction. Structure of a PC. Operating Systems
2. Basic concepts on programming.
3. Introduction to Python programming language.
4. Operators and expressions.
5. Control statements (if, switch, for, while, do-while).
6. Functions.
7. Arrays (lists, dictionaries)
8. Data files.
9. Visualization.

#### Laboratory:

Each unit described previously has at least one associated lab practice (3 hours/week)

- P1. Development environment (Jupyter HUB). Variables and operators
- P2. Data types and data structures
- P3. Conditionals and loops
- P4. Conditionals and loops
- P5. Conditionals and loops
- P6. Functions

- P7.** Text Files
- P8.** Advanced Files. CSV, XLS, JSON, web API.
- P9.** Web Scraping

## Textbook

- Slides used in classes.
- Slides include references to additional online resources

## Grading

- Final exam accounts for 70% of the final. It's a practical exam on computer.
- Mid-term exam accounts for 15%.
- Several small exams during lab sessions account for 15%