VNIVERSITAT DE VALÈNCIA

Course Guide
42603 Programming

COURSE DATA

Data Subject	
Code	42603
Name	Programming
Cycle	Master's degree
ECTS Credits	9.0
Academic year	2022 - 2023

Study (s)

Degree	Center	Acad. year	Period
2116 - M.U. en Bioinformática 12-V.1	School of Engineering	1	First term

Subject-matter

Degree	Subject-matter	Character
2116 - M.U. en Bioinformática 12-V.1	18 - Programming	Optional

Coordination

Name	Department
GARCIA FERNANDEZ, IGNACIO	240 - Computer Science
LOZANO IBAÑEZ, MIGUEL	240 - Computer Science

SUMMARY

This course is intended for students without a background in programming to acquire the basic knowledge to carry out programs. We begin with the Python programming language and it will be different types of data that we use and basic control structures used to perform a computer program.

Also give the basics of other programming languages like C and Perl, traditionally used in Bioinformatics.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

None

OUTCOMES

2116 - M.U. en Bioinformática 12-V.1

- Students should apply acquired knowledge to solve problems in unfamiliar contexts within their field of study, including multidisciplinary scenarios.
- Students should be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.
- Students should communicate conclusions and underlying knowledge clearly and unambiguously to both specialized and non-specialized audiences.
- Students should demonstrate self-directed learning skills for continued academic growth.
- Be able to access the information required (databases, scientific articles, etc.) and to interpret and use it sensibly.
- Students should possess and understand foundational knowledge that enables original thinking and research in the field.

LEARNING OUTCOMES

• Solve problems computationally, as a sequence of instructions to the computer.

• Understand and apply basic algorithmic procedures of information technology to design solutions to problems by analyzing the appropriateness and complexity of the proposed algorithms.

• Use efficiently the types and data structures suitable for storing data that will be processed.

• Design programs in a modular way using function calls.

• Access and manage data in files

• Write, compile and run programs in C and Perl.

DESCRIPTION OF CONTENTS

1. Introduction to Programming

Types of programming languages and paradigms
Vs. compiled languages. interpreted languages
Examples

2. Python as a calculator

First examples of using Python: The Python shell

3. Programs

Definition of program
First examples of Python programs

4. Control structures

Defining control structures
Sequential control structure: Definition and Examples
Conditional control structure: Definition and Examples
Iterative control structure: Definition and Examples

5. Structures data types

Definition of structured data type. Types and examples
Homogeneous structured data types in Python.

6. Functions

Modular programming: Definition and simple examples
Passing parameters

7. Records

Definition and use of records
Examples

8. Files

File types
Working with files: Basic Operations
Usage and Examples

9. Programming in C

Basics of programming in C
Examples

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	27,00	100
Laboratory practices	18,00	100
Attendance at events and external activities	3,00	0
Development of individual work	12,00	0
Study and independent work	25,00	0
Readings supplementary material	25,00	0
Preparation of evaluation activities	25,00	0
Preparing lectures	40,00	0
Preparation of practical classes and problem	25,00	0
Resolution of case studies	25,00	0
TOTAL	**225,00**	

TEACHING METHODOLOGY

MD1 - Task training of the teaching-learning environment interaction in the classroom through expository sessions. Previous assignments include preparation (information search, reading texts supplied by teachers), teaching sessions themselves and the later work of deepening.

MD2 - Learning through problem solving and case studies, through which it is acquiring skills on different aspects of materials and subjects.

MD3 - Hands-on lab. Include preparation, implementation of practices to monitor and teacher support, independent work online and reporting practices.

MD4 - Cross-disciplinary skills. Include attendance at courses, conferences or round tables organized by the CEC of the Master and / or conduct of a bibliographic work on issues that contribute to the integral. It produces a report of activities.

EVALUATION

Continuous assessment of student interaction in the classroom or laboratory or on-line activities (10%).

Evaluation of reports or reports delivered training activities on problems and case studies of cross-cutting activities or other arising (20%).

Evaluation of reports or reports delivered on laboratory practices (30%).

Evaluation of on-site exams (40%).

It is necessary to get at least a 3.5 in the evaluation of the exams to be able to mediate the notes.

In the second call will remain the weights of the various items, being able to improve the work handed in the labs.

REFERENCES

Basic

- Referencia b1: [Andr´es Marzal, Isabel Gracia, 2003] Introducción a la programación con Python
- Referencia b2: [Mitchell L Model, 2009] Bioinformatics Programming Using Python
- Referencia b3: [Vern Ceder,2010] The Quick Python Book

Additional

- Referencia c1: [Michael Dawson, 2009] Python® Programming for the Absolute Beginner
- Referencia c2: [Cody Jackson,2011] Learning to Program Using Python
- Referencia c3: [James Payne, 2010] Beginning Python®: Using Python 2.6 and Python 3.1