SUBJECT TEACHING GUIDE

G2008 - Programming

First Degree in Civil Engineering
Degree in Civil Engineering
BILINGUAL UC-CU CIVIL ENGINEERING PROGRAM
Academic year 2023-2024

1. IDENTIFYING DATA				
Degree	First Degree in Civil Engineering Degree in Civil Engineering		Type and Year	Core. Year 1 Core. Year 1
Faculty	School of civil Engineering			
Discipline	BASIC MATHEMATICS FOR ENGINEERING			
Course unit title and code	G2008 - Programming			
Number of ECTS credits allocated	6	Term	Semester based (2)	
Web				
Language of instruction	English		Mode of delivery	Face-to-face

Department	DPTO. MATEMATICA APLICADA Y CIENCIAS DE LA COMPUTACION
Name of lecturer	JAVIER GONZALEZ VILLA
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Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 1. DESPACHO PROFESORES (1026)
Other lecturers	

3.1 LEARNING OUTCOMES
- Know the basic fundamentals of computers and operating systems.
- Solve problems by programming computers.
- Know programming environments with application in civil engineering.
- Learn techniques and tools that allow effective data management.

4. OBJECTIVES
Identify the basic components of the computer and the operating system and their impact on its use.
Use the tools, processes and techniques necessary for the development and fine-tuning of computer programs.
Use development environments with application in civil engineering.
Use techniques and tools that allow proper data management.

6. COURSE ORGANIZATION	
CONTENTS	
1	Block I: Fundamentals 1. Computer fundamentals. 2. Operating Systems. 3. Programming languages. 4. Office automation tools. 5. Anaconda framework (Python) - JupyterLab
2	Block II: Basic Programming. 1. Basic types. 2. Strings, lists, tuples and dictionaries. 3. Branching and iteration. 4. Decomposition, abstraction and functions.
3	Block III: Advanced Programming. 1. Recursion. 2. Files and Data Bases. 3. Exceptions, Validation and Debugging. 4. Object Oriented Programming. 5. Standard library and libraries.
4	Block IV: Algorithmics and Complexity. 1. Efficiency. 2. Complexity classes.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Theoretical-practical test Blocks I and II.	Written exam	No	Yes	35,00
Theoretical-practical test Blocks III and IV.	Written exam	No	Yes	35,00
Group work: programming techniques in Civil Engineering.	Work	No	No	30,00
TOTAL				100,00

Observations

Those students who do not pass the evaluation criteria or whose overall ordinary evaluation of the course does not exceed the minimum grade may, during the extraordinary exam period, take a single theoretical-practical evaluation test that includes Blocks I, II, III and IV. The final grade of the course in the extraordinary exam period, for those students who present themselves for the recovery, will be calculated according to the percentages referred to in the different evaluation methods described in the teaching guide carried out during the course.

Observations for part-time students

For part-time students, the need to attend 50% of the practicals may be replaced by a practical test in the laboratory or by the delivery of a paper, and the group work may be replaced by a paper on the same subject but done individually.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Martelli, A., Ravenscroft, A. M., Holden, S., & McGuire, P. (2023). Python in a Nutshell. O'Reilly Media, Inc.

Matthes, E. (2019). Python Crash Course, 2nd Edition: A Hands-On, Project-Based Introduction to Programming. No Starch Press.