SUBJECT TEACHING GUIDE

5336 - Programming

Double Degree in Civil Engineering and Management of International Civil Engineering Projects
First Degree in Civil Engineering

Academic year 2026 - 2027

1. IDENTIFYING DATA					
Degree	Double Degree in Civil Engineering and Management of International Civil Engineering Projects First 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	5336 - Programming				
Number of ECTS credits allocated	6	Term		Semester based (2)	
Knowledge Field	Architecture, construction, building and urban planning, civil engineering				
Web					
Language of instruction	Spanish	English Friendly	No	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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Other lecturers	JOSE DEMETRIO GOMEZ VAQUERO

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. SUBJECT PROGRAM

CONTENTS	
1	Block I: Fundamentals 1. Computer fundamentals. 2. Operating Systems. 3. Programming languages. 4. 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. Object Oriented Programming. 4. Exceptions, validation and debugging.
4	Block IV: Modularity and Complexity. 1. Efficiency and complexity classes. 2. Standard library and libraries.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessment	%
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

To pass the course, students must achieve an average mark of 4.0 or above in the theoretical and practical assessments, and 5.0 or above in the overall assessment of all assessment activities.

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 students enrolled in part-time programs, exams may be replaced by a practical lab assignment or the submission of a paper, and group projects may be replaced by an individual assignment on the same topic.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

González Duque, R. (2011). Python para todos.

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