SUBJECT TEACHING GUIDE

360 - Advanced Programming

Master's Degree in Mathematics and Computing

Academic year 2026 - 2027

1. IDENTIFYING DATA					
Degree	Master's Degree in Mathematics and Computing			Type and Year	Compulsory. Year 1
Faculty	Faculty of Sciences				
Discipline					
Course unit title and code	360 - Advanced Programming				
Number of ECTS credits allocated	3	Term		Semester based (1)	
Web	https://personales.unican.es/bernardp/programacion/index.html				
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. MATEMATICA APLICADA Y CIENCIAS DE LA COMPUTACION
Name of lecturer	PILAR BERNARDOS LLORENTE
E-mail	pilar.bernardos@unican.es
Office	E.T.S. de Ingenieros Industriales y de Telecomunicación. Planta: - 5. DESPACHO (S5018)
Other lecturers	JAVIER GONZALEZ VILLA

3.1 LEARNING OUTCOMES
Assemble software tests
Apply object oriented programming
Apply functional programming
Practical application of main abstract data types
Vectorization usage
Concepts of parallel programming

4. OBJECTIVES
Advanced programming
Abstract data types in object oriented programs

Practical application of algorithms and abstract data types
Finding the right package/library for a specific purpose

6. COURSE ORGANIZATION	
CONTENTS	
1	Python introduction. Test oriented programming.
2	Object oriented programming
3	Vector operations: numpy
4	Functional programming
5	Abstract data types
6	Quest for speed. Parallel programming

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessment	%
Exercises and programs	Others	No	Yes	40,00
Exams along the course	Laboratory evaluation	No	Yes	60,00
TOTAL				100,00
Observations				
Should any prevailing requirements forbid face-to-face evaluation, number, weights, conditions and exercise types would vary.				
Observations for part-time students				
Students that are unable to attend classes or to prepare presentations, may opt for a makeup exam.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
Se proporcionarán materiales a lo largo del curso. El apoyo principal es la documentación oficial: https://docs.python.org/es/3/ (visitado el 20-5-25)