SUBJECT TEACHING GUIDE

G2005 - Methods of Programming

Degree in Mathematics

Academic year 2026 - 2027

1. IDENTIFYING DATA					
Degree	Degree in Mathematics			Type and Year	Optional. Year 4
Faculty	Faculty of Sciences				
Discipline	Mention in Computer Science				
Course unit title and code	G2005 - Methods of Programming				
Number of ECTS credits allocated	6	Term		Semester based (1)	
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. INGENIERÍA INFORMÁTICA Y ELECTRÓNICA
Name of lecturer	MARIO ALDEA RIVAS
E-mail	mario.aldea@unican.es
Office	Facultad de Ciencias. Planta: + 3. DESPACHO - COMPUTADORES TIEMPO REAL (3054)
Other lecturers	ADOLFO GARANDAL MARTIN

3.1 LEARNING OUTCOMES
Know the fundamentals of computer programming and of programming reasoning, including modularity and object orientation.
Be able to argue convincingly about the correction of individual recursive and loop structures based solely on static analysis.
To be able to correctly and effectively apply criteria for the modular decomposition of problems to a sufficient degree to complete the programming of their solution.
Know how to apply an object oriented methodology, including class diagrams.
Be able to write and read data from a file.
Be able to document source code properly.

4. OBJECTIVES
The student must know how to apply the object oriented programming methodology to the development of medium complexity software applications using the Java programming language.

Students should learn the following concepts: software development basics; relation among class, reference and object; Class and primitive type; Class as the base structural element; Inheritance and polymorphism; Error handling using exceptions; modularity and abstraction; binary and text files; unitary testing.
Java is used as the programming language to practice the concepts taught in the subject.

6. COURSE ORGANIZATION

CONTENTS	
1	Object-Oriented Software Development
2	Object-Oriented programming in Java
3	Modular design
4	Exceptions and error handling
5	Inheritance and polymorphism
6	I/O with files

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessment	%
Evaluation of the exercises performed by the students in the laboratory sessions.	Laboratory evaluation	No	Yes	15,00
Laboratory evaluation. Two or more exams performed during the teaching period.	Laboratory evaluation	No	Yes	85,00
Only for part-time students. This exam allows part-time students to pass the partial exams they have not been able to take during the course.	Laboratory evaluation	Yes	Yes	0,00
TOTAL				100,00

Observations
In order to pass the subject it is compulsory to obtain the minimum grade in the Laboratory and Written evaluations (4.5).
Observations for part-time students
Part-time students do not need to attend to the Laboratory evaluations performed during the course. They can pass the subject by attending to the evaluations in the ordinary and/or extraordinary periods.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Ken Arnold, James Gosling, David Holmes, "El lenguaje de programación Java", 3a edición. Addison-Wesley, 2000.

Francisco Gutiérrez, Francisco Durán, Ernesto Pimentel. “Programación Orientada a Objetos con Java”. Paraninfo, 2007.