

SUBJECT TEACHING GUIDE

G263 - Linear and Discrete Algebra

Degree in Computer Systems Engineering

Academic year 2022-2023

1. IDENTIFYING DATA					
Degree	Degree in Computer Systems Engineering			Type and Year	Core. Year 1
Faculty	Faculty of Sciences				
Discipline	Subject Area: Mathematical Foundations of Computer Science Basic Training Module				
Course unit title and code	G263 - Linear and Discrete Algebra				
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. MATEMATICAS, ESTADISTICA Y COMPUTACION				
Name of lecturer	LUIS FELIPE TABERA ALONSO				
E-mail	luisfelipe.tabera@unican.es				
Office	Facultad de Ciencias. Planta: + 0. DESPACHO LUIS FELIPE TABERA ALONSO (0062)				
Other lecturers					

3.1 LEARNING OUTCOMES
- Use the most common number systems, N , Z , Z/p , Q , R and C
- Basic results in divisibility and applications
- Solving systems of linear equations.
- Work with vectors, points, matrices, coordinates etc.
- Linear maps, kernel and image.
- Eigenvectors and eigenvalues.
- Use of computer algebra software

4. OBJECTIVES

Simple algebraic structures: groups, rings, finite fields and applications
Compute with integers, residues, real and complex numbers, and polynomials
Compute with vectors, points, coordinates, distances, angles, lines and planes
Recognize the structure of a vector space, computing generators and dimension
Work in finite fields

6. COURSE ORGANIZATION

CONTENTS

1	Elementary set theory: union, intersection, complementary, De Morgan's law; functions; induction.
2	Linear algebra; vector spaces, bases; System of linear equations; linear maps, matrices; endomorphisms; Euclidean geometry;
3	Rings, fields, groups; univariate polynomials. Great common divisor and Euclid's algorithm. Diophantine equations and Chinese remainder theorem.
4	Final exam

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Final written exam	Written exam	Yes	Yes	50,00
group work	Work	No	Yes	20,00
Home and lab assignments.	Written exam	No	Yes	30,00
TOTAL				100,00
Observations				
During the final exam there will be several questions to retake failed home assignments.				
Observations for part-time students				
The evaluation of part time student will be the same as the rest of students.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

L.F. Tabera
Apuntes de Álgebra Lineal y Discreta