SUBJECT TEACHING GUIDE

G414 - Algebra and Geometry

Degree in Industrial Technologies Engineering
First Degree in Industrial Technologies Engineering

Academic year 2023-2024

1. IDENTIFYING DATA				
Degree	Degree in Industrial Technologies Engineering First Degree in Industrial Technologies Engineering	Type and Year		Core. Year 1 Core. Year 1
Faculty	School of Industrial Engineering and Telecommunications			
Discipline	Subject Area: Mathematics Basic Training Module			
Course unit title and code	G414 - Algebra and Geometry			
Number of ECTS credits allocated	6	Term	Semester based (2)	
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	SARA PEREZ CARABAZA
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Other lecturers	VALVANUZ FERNÁNDEZ QUIRUELAS

3.1 LEARNING OUTCOMES
- Solve mathematical problems in the field of engineering.   Apply the methods of algebra and geometry, as well as algebraic and numerical methods for solving problems in Industrial Engineering.

4. OBJECTIVES
Provide the knowledge and use of the rules of linear algebra and geometry as well as their properties and applications, with particular emphasis on its relationship with algebraic resolution numerical techniques.

6. COURSE ORGANIZATION

CONTENTS	
1	LINEAR SYSTEMS EQUATIONS AND MATRICES. Classification. Equivalent systems. Elementary matrices. Row echelon form. Rank. LU factorization. Linear equations numerical solution systems.
2	VECTOR SPACES. Definition. Subspace. Linear independence and linear dependence. Bases and Dimension. Euclidean vector space: Scalar product. Orthogonal and orthonormal bases. QR factorization. Orthogonal projection. Least-squares fit. Applications.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Exam block I. It will consist of a theoretical part and problems solved with Matlab. It will last two hours.	Written exam	No	Yes	35,00
Exam block II. It will consist of a theoretical part and problems solved with Matlab It will last two hours.	Written exam	No	Yes	35,00
For the assessment of this section, different tasks will be proposed throughout the semester (tests, written exercises, MATLAB exercises, etc.), without prior notice.	Work	No	No	30,00
This exam consists of theoretical-practical questions and MATLAB problem-solving exercises. Each student can take the exam for the block or blocks not passed.	Written exam	Yes	Yes	0,00
TOTAL				100,00

Observations
Students who have not passed the course after the ordinary session will have the opportunity to take the exam in the extraordinary session, for which the grade obtained in the 'continuous evaluation tests' section will be kept. This exam will cover the entire course and will consist of both theoretical-practical questions and problem- solving using MATLAB.

Observations for part-time students
Part-time students will have the option to choose between completing the same assessment as full-time students or opting to only take the exams. In other words, they will have the possibility to choose not to participate in the continuous assessment, in which case the final grade will be based on 50% Block I exam and 50% Block II exam.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC
Carl D. Meyer. "Matrix Analisis and Applied Linear Algebra", Ediatorial SIAM.
Grossman, S.I., "Algebra Lineal", Ed. MacGraw-Hill.
Juan de Burgos, "Algebra Lineal", Ed. MacGraw-Hill.