SUBJECT TEACHING GUIDE

G89 - Linear Algebra II

Double Degree in Physics and Mathematics
Degree in Mathematics

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	Double Degree in Physics and Mathematics Degree in Mathematics			Type and Year	Compulsory. Year 2 Compulsory. Year 2
Faculty	Faculty of Sciences				
Discipline	Subject Area: Algebra Module: Compulsory Subjects				
Course unit title and code	G89 - Linear Algebra II				
Number of ECTS credits allocated	6	Term		Semester based (1)	
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. MATEMATICAS, ESTADISTICA Y COMPUTACION
Name of lecturer	JESUS JAVIER JIMENEZ GARRIDO
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Other lecturers	TOMAS MARTIN HERNANDEZ

3.1 LEARNING OUTCOMES

- To relate, in an abstract context, the concepts of distance, measure of angles and scalar product in certain vectorial spaces.

To know the notion of Euclidean vectorial space and its main properties.

Orthonormal bases construction and orthogonal projections.

Relate the intuitive concept of motion of a rigid body (in the plane or in real space) with orthogonal transformations.

Understand and recognize the metrics of a Euclidean vector space depending on its properties and invariants.

4. OBJECTIVES

Knowledge of linear algebra referring to the vector spaces with inner product.
To know and to distinguish the basic techniques of the demonstrations of Linear Algebra .
Study of the vectorial spaces from a point of view of linear algebra (affine spaces) as well as from the geometric point of view (Euclidean spaces).
Recognize affinities, isometries and movements.
Clasify metrics and their associated quadratic forms by rank, index, and signature.

6. COURSE ORGANIZATION

	CONTENTS
1	Euclidean Geometry. Bilinear and multilinear forms. Determinants. Orthogonality. Orthogonal bases and diagonalization. Equivalence and classification of metrics. Spectral theorem. Norm and scalar product. Orthogonal transformations.
2	Affine Geometry. Affine varieties. Euclidean affine space. Angles and distances. Isometries. Classification of isometries. Conics and quadrics
3	Partial Exam
4	Final Exam

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Partial Exam	Written exam	No	Yes	49,00
Final Exam	Written exam	Yes	Yes	51,00
TOTAL				100,00

Observations

(A) In the final exam of the subject, both in the ordinary and extraordinary call, those students who have not obtained at least the minimum grade in the partial test, or wish to increase their grade in this test, will have a substitute test that will allow the student to modify the grade obtained in the partial test.

(B) The final grade of the course, both in the ordinary and in the extraordinary call, is the weighting of the grade of the partial test or of the substitutive test in case of taking it (49%), and the grade of the final exam (51%), according to the indicated percentages, as long as the minimum grade required in each part is obtained.

(C) In accordance with current regulations:
- If a student did not obtain the minimum grade required in any of the parts, the grade for the course will be the lower value between 4.9 and the grade achieved according to section (A).
- When a student has not carried out evaluation activities whose weight exceeds 50% of the grade for the course, he/she will appear in his/her transcript as not presented, and when he/she has taken tests that account for 50% or more, the corresponding grade will appear in the transcript. The weighting of the various methods of evaluation is set so that those who do not take the final exam will receive the grade of 'no-show'.
- The fraudulent performance of the tests or evaluation activities will directly result in the grade of '0' in the subject in the corresponding call, thus invalidating any grade obtained in all evaluation activities for the extraordinary call.

(D) In order to determine the grade of the written tests and/or deliveries, the oral defense of the same may be requested..

Observations for part-time students

These students can choose between the evaluation system of regular students and one in which they only need to do the final exam and receive its grade as their final grade

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Apuntes de la asignatura.