

Program	59EC – Communications Electronic Engineering B. Eng.	
_	59SC – Telecommunications Systems Engineering B. Eng.	
	59SO – Sound and Image Engineering B.Eng.	
	59TL – Telematics Engineering B. Eng.	

Course number and name		
Number	595000301, 595000101, 595000201, 595000002	
Name	Linear Algebra	
Semester	S1 [(September-January)]	

	Credits and contact hours
ECTS Credits	6
Contact hours	60

Coordinator's name	Delgado López, Rafael [rafael.delgado@upm.es]
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Specific course in	nformation
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Description of course content

Basic linear algebra is studied, with special attention on the changes of base, on the diagonizable matrix and on the orthogonal projection. The theoretical contents are complemented by the resolution of problems and with practices using mathematical software. In this practical part some of the most significant applications of algebra to Telecommunication engineering, establishing connections with other subjects.

List of topics to be covered

- 1. Systems of linear equations
- 2. Linear combinations
- 3. Matrices algebra
- 4. Determinants
- 5. Linear transformations
- 6. Rⁿ subspaces
- 7. Vectorial spaces
- 8. Diagonalization
- 9. Orthogonality
- 10. Symmetric matrices diagonalization
- 11. Differential linear equations

Prerequisites or co-requisites

None

Specific goals for the course

Specific outcomes of instruction



- RA8 To get basic knowledges about theoretical fundamentals of the vector spaces.
- RA11 To handle the matrix and vector algebra.
- RA2 To understand the need of linking the intuition with the precision and rigour to formulate and address scientific and technical questions.
- RA3 To understand the need of the abstraction to transfer the physical information of problems to mathematical formulas that provide their resolution.
- RA4 To achieve calculus skills and to be aware about their importance to get results thanks to the resolution of exercises and problems.

Further reading and supplementary materials

- Moodle.

– Álgebra Lineal y sus Aplicaciones. D.C. Lay. Ed. Pearson Educación.