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 code and name	
Code	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]

Specific course information	
Tuition language	Spanish

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. R^n subspaces
7. Vectorial spaces
8. Diagonalization
9. Orthogonality
10. Symmetric matrices diagonalization
11. Differential linear equations

Prerequisites or co-requisites

None

Course category in the program

☑ **R (required)**	☐ **E (elective)** *(elective courses may not be offered every year)*

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.