DMA-GITI-101 Algebra and Geometry

SEMESTER: Full-year (Fall and Spring)
CREDITS: 9 ECTS (3 hrs. per week)
LANGUAGE: Spanish
DEGREES: GITI

Course overview
This course is an introduction to Linear Algebra and Differential Geometry. It focuses on providing the basic tools from the lineal algebra and differential geometry and in showing some of their applications in the engineering field. All the contents will be analyzed including several examples taken from the real life or other sciences like physics, economics, etc. The theoretical classes complement each other with the laboratory where the problems are solved using the computer.

Prerequisites
Basic knowledge of Algebra, Geometry and Real Analysis is required for attending this course.

Course contents
Theory:
Part I

Part II


Laboratory:
There will be five 1-hour sessions during the course, between the third and the last lecture week.

P1. Introduction to MATLAB. Matrices and Determinants.
P2. Systems of Linear Equations.
P3. Vector Spaces.
P4. Linear Transformations. Eigenvalues, Eigenvectors and Jordan Canonical Form.
P5. Euclidean Vector Space.

Textbooks


Grading
The overall grade by term is obtained as follows:

- Final term exam 60%.
- Mid-term exam (1.5-hour long) 25%.
- Additional short-term exams (included a Lab term exam) 15%.
- The final second term exam will only cover the contents taught in the second term, if the first term overall grade is at least 4 over 10. In other case, it will cover all the contents of the course.
The following conditions must be accomplished to pass the course:

- If the first term overall grade was at least 4, then the second term overall grade must be at least 4 over 10 and the average of both overall grades (first and second terms) must be at least 5 over 10.
- If the first term overall grade was less than 4, then the second term overall grade must be at least 5 over 10.