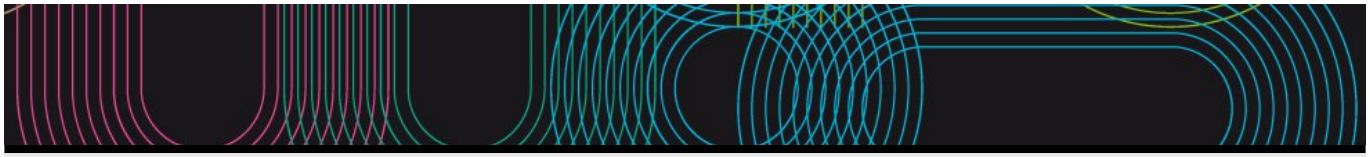

IDENTIFYING DATA				
Mathematics: Linear algebra				
Subject	Mathematics: Linear algebra			
Code	O07G410V01102			
Study programme	Grado en Ingeniería Aeroespacial			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	1st
Teaching language	#EnglishFriendly Galician			
Department				
Coordinator	García Martínez, Xabier			
Lecturers	García Martínez, Xabier			
E-mail	xabier.garcia.martinez@uvigo.gal			
Web	http://aero.uvigo.es/gl/			
General description	This subject is part of Mathematics and it is taught in the first semester of the first course. The other subjects of Mathematics are: Calculus I, in the first semester of the first course and Calculus II in the second semester of the first course. Competences of linear algebra are acquired, being a part of them fundamental for the other subjects of Mathematics. The subject has the character of basic training. It provides the mathematical basis to different disciplines in the field of the aeronautical engineering such as the calculation and manufacture of vehicles and numerical simulation. English Friendly subject: International students may request from the teachers: a) materials and bibliographic references in English, b) tutoring sessions in English, c) exams and assessments in English.			

Training and Learning Results	
Code	
A1	That the students demonstrate to possess and understand knowledge in an area of study that is part of the general education (second level), and often found at a level that, although based on advanced textbooks, also includes some aspects that involve knowledge from the avant-garde of the field of study
B2	Planning, documentation, project management, calculation and manufacturing in the field of aeronautical engineering (in accordance with what is established in section 5 of order CIN / 308/2009), aerospace vehicles, propulsion systems, aerospace materials, airport infrastructures, air navigation infrastructures and space management, air traffic and transport management systems.
C1	Capability to solve mathematical problems that may arise in engineering. Aptitude to apply the knowledge about: linear algebra; geometry; differential geometry; differential and integral calculation; differential equations and partial derivatives; numerical methods; numerical algorithm; statistics and optimization.
C32	Appropriate knowledge applied to engineering: methods of calculation and development of materials and defence systems; management of experimental techniques, equipment and measuring instruments; numerical simulation of the most significant physical-mathematical processes; inspection, quality control and fault detection techniques; their most appropriate methods and repair techniques.
D1	Capability of analysis, organization and planification.
D3	Capability of oral and written communication in native lenguage
D4	Capability of autonomous learning and information management
D5	Capability to solve problems and draw decisions
D8	Capabiliity for critical and self-critical reasoning

Expected results from this subject	
Expected results from this subject	Training and Learning Results

Knowledge and understanding of the main concepts, techniques and numerical methods of Linear Algebra. Ability to apply them to other branches of Mathematics and Engineering Sciences.	A1	B2	C1 C32	D1 D3 D4 D5 D8

Contents	
Topic	
BLOCK I	1. Complex numbers. 2. Systems of linear equations.
BLOCK II	3. Vector spaces. 4. Linear transformations and matrices.
BLOCK III	5. Euclidean vector spaces. 6. Diagonalisation. Orthogonal transformations.
BLOCK IV	7. Numerical methods: resolution of systems of linear equations. Computation of eigenvalues.

Planning			
	Class hours	Hours outside the classroom	Total hours
Introductory activities	1	1	2
Lecturing	18	37	55
Problem solving	27	30	57
Autonomous problem solving	4	17	21
Essay questions exam	2.5	12.5	15
*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.			

Methodologies	
	Description
Introductory activities	Activities directed to take contact and gather information on the students, as well as to present the subject.
Lecturing	Exposition of the contents of the subject. It will be illustrated with numerous examples and applications.
Problem solving	Approach, analysis, resolution and debate of a problem or exercise related with the subject, given to illustrate and complete the explanation of each lesson.
Autonomous problem solving	It will be proposed exercises and problems that the students have to resolve in group by using collaborative learning as a integrated methodology.

Personalized assistance	
Methodologies	**Description**
Introductory activities	Attention and resolution of doubts to the students in relation to the different activities of the matter.
Lecturing	Attention and resolution of doubts to the students in relation to the different activities of the matter.
Problem solving	Attention and resolution of doubts to the students in relation to the different activities of the matter.
Autonomous problem solving	Attention and resolution of doubts to the students in relation to the different activities of the matter.
Tests	**Description**
Essay questions exam	Before the realisation of the exam, attention and resolution of doubts to the students in relation to the different activities of the matter.

Assessment						
	Description	Qualification	Training and Learning Results			
Autonomous problem solving	Two midterm exams on the content corresponding to the first two units (lectures and problem-solving sessions).	60	A1	B2	C1 C32	D3 D4 D5 D8

Essay questions exam	Final exam that will cover the content from all lectures and problem-solving sessions throughout the course. Duration: 2.5 hours.	40	A1	B2	C1 C32	D3 D4 D5 D8

Other comments on the Evaluation

CRITERIA OF EVALUATION FOR THE FIRST CALL

Following the continuous assessment method:

If a student does not show to any of the exams, a qualification of 0 will be assigned.

P1: Grade for midterm exam 1;
P2: Grade for midterm exam 2;
F: Grade for final exam.

In the case of achievieng at least a 4.5 in the final test, the qualification will be:

max(F, 0.3*P1 + 0.3*P2 + 0.4*F)

In the case of not achieving a minimum a 4 in the final test, the qualification will be:

min(4.5, max(F, 0.3*P1 + 0.3*P2 + 0.4*F))

Following the exam-only assessment method:

The final grade will be determined just by the final exam.

The student has the right to opt for the global assessment according to the procedure and the deadline established by the centre for each call. Note that due to the nature of the evaluation formulas, it is not necessary for the student to make any decisions.

CRITERIA OF EVALUATION FOR THE SECOND CALL AND END-OF-PROGRAM CALL

The final mark will be determinated by an exam about all the subject.

EXAM DATES

Continuous assessment tests will be carried out during teaching hours.

The calendar of exams officially approved by the centre will be published in the webpage
http://aero.uvigo.es/gl/docencia/examinations

Sources of information

Basic Bibliography

González, R., **Álxebra linear**, 1ª ed, Universidade de Vigo, 2021
Grossman, S. I., **Álgebra lineal**, 7ª, S.A. Mc Graw Hill, 2012
Hernández, E., **Álgebra y Geometría**, 3ª, Addison-Wesley, 2012
Lay, D. C., **Álgebra lineal y sus aplicaciones**, 4ª ed, Pearson, 2012
Merino, L.; Santos, E., **Álgebra Lineal con métodos elementales**, 1ª ed, Paraninfo, 2006

Complementary Bibliography

Baker, R.; Kuttler, K., **Linear algebra with applications**, 1st ed, World Scientific, 2014
Burgos, Juan de, **Álgebra lineal y geometría cartesiana**, 3ª ed, S.A. Mc Graw Hill, 2006
Castellet, M. ; Llerena, I., **Álgebra Lineal y Geometría**, 1ª ed, Reverté, 1991
Lipschutz, S., **Álgebra Lineal**, 2ª ed, S.A. Mc Graw Hill, 1992

Recommendations