Universida_{de}Vigo

Subject Guide 2023 / 2024

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IDENTIFYIN	G DATA				
Mechanics	of flight				
Subject	Mechanics of flight				
Code	O07G410V01924				
Study	Grado en				
programme	Ingeniería				
	Aeroespacial				
Descriptors	ECTS Credits		Choose	Year	Quadmester
	6		Optional	4th	1st
Teaching	#EnglishFriendly				
language	Spanish				
	English				
Department					
Coordinator	Orgeira Crespo, Pedro				
Lecturers	Gómez San Juan, Alejandro Manuel				
	Orgeira Crespo, Pedro				
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General	Flight mechanics include the study o	of the performar	ice, stability, and	static and dyna	mic control of aerospace
description	vehicles (focusing on fixed-wing airc	raft in this cours	se), as well as flig	ht qualities and	tests.
	English Friendly subject: Internationa references in English, b) tutoring ses	al students may sions in English	request from the , c) exams and as	teachers: a) m sessments in E	aterials and bibliographic nglish.

Training and Learning Results

Code

- A2 That the students know how to apply their knowledge to their work or vocation in a professional way and that they possess the competences that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study
- A3 That the students have the capability to gather and interpret relevant data (usually within their area of study) to issue judgments that include a reflection on relevant social, scientific or ethical issues
- A5 That the students develop those learning capabilities necessary to undertake further studies with a high degree of autonomy.
- B6 Capability to participate in flight testing programs for take-off and landing distances, ascent speeds, loss speeds, maneuverability and landing capacities.
- C23 Appropriate knowledge applied to engineering: physical phenomena of flight, its qualities and its control, aerodynamics, propulsive forces, active control and stability.
- C26 Applied knowledge of aerodynamics; mechanics and thermodynamics, flight mechanics, aircraft engineering (fixed and rotary wings), theory of structures.
- C31 Appropriate knowledge applied to engineering: physical phenomena of air defense systems, their qualities and their control, stability and automatic control systems.
- C33 Applied knowledge of aerodynamics, flight mechanics, air defense engineering (ballistics, missiles and air systems), space propulsion, material science and technology, structure theory.
- 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
- D6 Capabiliity for interpersonal communication
- D8 Capabiliity for critical and self-critical reasoning
- D11 Show motivation for quality with sensitivity towards subjects within the scope of the studies

Expected results from this subject							
Expected results from this subject				Training and Learning			
			Results	5			
Knowledge of the most stood out appearances of the qualities of flight and the essays in flight of	A5	B6	C23	D8			
the aircraft			C33	D11			

Knowledge, understanding, application, analysis and synthesis of the performances, the stability	A2	C26	D3
and controlabilidad static and dynamic of the aircraft.		C31	D4
			D5
			D6

Contents	
Торіс	
1. Introduction to the mechanics of flight.	1.1. Introduction to the mechanics of flight.
	1.2. Systems of reference and angles in mechanics of flight.
	1.3. General equations of the movement.
2. Performances of gliders and aeroplanes	2.1. Performances of gliders
propulsados by air jets and by alternative engines.	2.2. Performances of aeroplanes propulsados by air jets in horizontal rectilinear flight
-	2.3. Performances of aeroplanes propulsados by air jets in another type of flights
	2.4. Performances of aeroplanes propulsados by alternative engines 2.5. Performances in takeoff and landing
3. Stability and static and dynamic control	3.1. Stability and longitudinal static control
	3.2. Stability and lateral static control-directional
	3.3. Introduction to the stability and dynamic control
4. Introduction to the Qualities of Flight and to the Essays in Flight.	4.1. Introduction to the Qualities of Flight and to the Essays in Flight.

Planning			
	Class hours	Hours outside the classroom	Total hours
Problem solving	18	0	18
Lecturing	26.5	0	26.5
Autonomous problem solving	0	80	80
Mentored work	4	17.5	21.5
Objective questions exam	2.5	0	2.5
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*The information in the planning table is	for avidonce only and door no	t take into account the hot	araganaity of the students

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies	
	Description
Problem solving	Resolution of problems and/or exercises that treat punctual appearances of the contents of the
	subject, developed by the professor and/or the students in the classroom.
Lecturing	Exhibition of a subject by part of the professor according to a previously established script
Autonomous problem	Study of the student of autonomous form, with the support of the professor if required according to
solving	the procedures established by the university
Mentored work	The tutoring work consists in the preparation of a project of design of an aircraft using the concepts
	learnt during the subject of mechanics of flight. It will be necessary on the other hand review key
	ideas of the subject of aerodynamics and aeroelasticidad. The work is of preparation in groups.

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Autonomous problem solving	Study of the student of autonomous form, with the support of the professor if required according to the procedures established by the university

Assessment						
	Description	Qualificati	alification Training and Learnin Results			earning
Mentored work	The tutoring work consists in the preparation of a project of design	30	A2 A3 A5	B6	C23 C26 C31 C33	D4 D5 D6 D8 D11

Objective questions exam	Resolution of problems and/or conceptual questions on the contents of the subject	40	A2 A3 A5	B6	C23 C26 C31 C33	D3 D4 D5 D8 D11
Objective questions exam	Resolution of problems and/or conceptual questions on the contents of the subject	30	A2 A3 A5	B6	C23 C26 C31 C33	D3 D4 D5 D6 D8 D11

Other comments on the Evaluation

By default, the evaluation is assumed to be continuous. The student has the right to opt for the global evaluation according to the procedure and deadline established by the center for each call.

- Continuous assesment:

- At the first call:

- There will be a partial, liberating and retrievable exam during the course, with part of the contents of the subject. To pass said written test and release that part of the subject, it is necessary to obtain a grade of 5 out of 10; this part can be released if the grade exceeds 4 out of 10, and if the rest of the parts compensate the grade to exceed a final grade of 5 out of 10. The weight of this test in the final grade for this case is 30%.

- A final exam will be held on the official date indicated by the center. Said written test will consist of two parts: a first for students who have passed the partial exam, and with a weight of 40% in the final grade; a second part, for students who have not passed the partial exam (with its weight, of 30%)

- A group work will be carried out, with a weight of 30% in the final grade. Each member of the group can obtain a different qualification.

- The minimum grade to be achieved in any test will be 4 out of 10 to be able to balance the exam and practicals. To pass the subject, you must pass a weighted grade (written exams, work), of 5 out of 10. The written tests may consist of test-type questions and/or short questions and/or development questions.

- In the second call:

- Students who have not passed the subject at the first callwill take an exam that will cover all aspects of the subject, on the official date indicated by the center.

- To pass the subject you must pass 5 out of 10. The exam may consist of test-type questions and/or short questions and/or development questions.

- Exam-only assesment/End-of-program callr:

- At the first call:

- A final exam will be held on the official date indicated by the center, which will cover all aspects of the subject.

- To pass the subject you must pass 5 out of 10. The exam may consist of test-type questions and/or short questions and/or development questions.

- In the second call:

- The conditions are the same as in the case of continuous assessment.

In case of detection of plagiarism in any qualification item, the qualification in said item will be 0 and the fact will be communicated to the Center's management for the appropriate effects.

Sources of information

Basic Bibliography

Gómez Tierno M.A., Pérez Cortés M., and Puentes Márquez C., **Mecánica del vuelo**, 2, Ibergarceta Publicaciones S.L., 2012 **Complementary Bibliography**

Recommendations

Subjects that it is recommended to have taken before

Aerodynamics and aeroelasticity/O07G410V01923