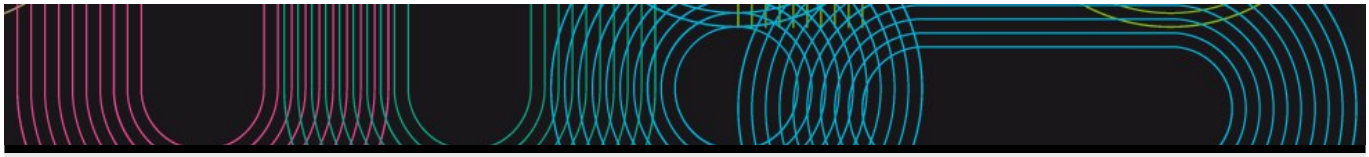

IDENTIFYING DATA				
Maintenance and certification of aerospace vehicles				
Subject	Maintenance and certification of aerospace vehicles			
Code	O07G410V01935			
Study programme	Grado en Ingeniería Aeroespacial			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	9	Optional	4th	1st
Teaching language	#EnglishFriendly Spanish Galician			
Department				
Coordinator	Ulloa Sande, Carlos			
Lecturers	Ulloa Sande, Carlos			
E-mail	carlos.ulloa@uvigo.es			
Web	http://aero.uvigo.es			
General description	Airworthiness is the ability of aircraft to fly. This quality is ensured through certification, which is made up of a set of tasks that guarantee that the aircraft is in safe conditions for the flight. To ensure that these conditions are maintained over time, we must speak of continuing airworthiness, that is, all the revisions, modifications and maintenance tasks necessary to maintain airworthiness over time. This subject deals with the procedures that affect airworthiness, basically analyzing the EASA and FAA regulations. 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.			

Competencies	
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.
B3	Installation, operation and maintenance in the field of aeronautical engineering (in accordance with what is established in section 5 of order CIN / 308/2009), aerospace vehicles, aerospace propulsion systems, aerospace materials, infrastructures and airports, air navigation infrastructures and space management, air traffic and transport management systems.
B4	Verification and certification in the field of aeronautical engineering that aim, in accordance with the knowledge acquired (in accordance with what is established in section 5 of order CIN / 308/2009), aerospace vehicles, aerospace propulsion systems, aerospace materials, airport infrastructures, air navigation infrastructures and space management, air traffic and transport management systems.
C21	Appropriate knowledge applied to engineering: foundations of sustainability, maintenance and operation of aerospace vehicles.
C25	Appropriate knowledge applied to engineering: methods of design calculations and aeronautical projects; use of aerodynamic experimentation and the most significant parameters in the theoretical application; management of experimental techniques, equipment and measuring instruments; simulation, design, analysis and interpretation of experimentation and operations in flight; systems of maintenance and certification of aircrafts.
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

Learning outcomes				
Expected results from this subject	Training and Learning Results			
- Knowledge, understanding, application, analysis and synthesis of aircraft certification and maintenance methods.	A2 A3 A5	B3 B4	C21	D3 D4 D5 D6 D8 D11 D13
- Applied knowledge of simulation, design, analysis and synthesis of experimentation and flight operations.	A2 A3 A5	B3 B4	C25	D3 D4 D5 D6 D8 D11 D13

Contents	
Topic	
Block 1: Certification	Unit 1.1: Introduction and concepts Unit 1.2: Organizations competent in airworthiness Unit 1.3: Airworthiness requirements Unit 1.4: The type certificate. The TC process. Unit 1.5: Production of articles, pieces and devices. Unit 1.6: Certificates of airworthiness Unit 1.7: Aircraft and operations certification codes Unit 1.8: Modification of aircraft Unit 1.9: Testing during certification and test flights
Block 2: Maintenance	Unit 2.1: Fundamentals of aeronautical maintenance Unit 2.2: Continuing airworthiness Unit 2.3: Management and types of maintenance Unit 2.4: Quality assurance and maintenance safety

Planning	Class hours	Hours outside the classroom	Total hours
Lecturing	33	0	33
Laboratory practical	20	0	20
Seminars	3.5	0	3.5
Previous studies	0	126	126
Objective questions exam	2.5	0	2.5
Report of practices, practicum and external practices	0	10	10
Essay	20	10	30

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

Methodologies	Description
Lecturing	Classroom lectures
Laboratory practical	Labs using different testing techniques Conducting certification practices Case studies of accident investigation
Seminars	Tutoring in small groups
Previous studies	Autonomous work

Personalized assistance	
Methodologies	**Description**
Seminars	Small group tutoring with the teachers of the subject. The tutorials will be held, preferably, by appointment, in the teacher's virtual office, on the Remote Campus.

Assessment

	Description	Qualification	Training and Learning Results			
Objective questions exam	Partial eliminatory exam Certification of short questions and problems (40%)* Final exam Maintenance of short questions and problems (40%) * In case of failing the first partial eliminatory exam, the exam must be done again on the date of the final exam.	80	A2 A3 A5	B3 B4	C21 C25	D3 D4 D5 D8 D11 D13
Report of practices, practicum and external practices	Labs report	5	A2 A3 A5	B3 B4	C21 C25	D3 D4 D5 D6 D8 D11 D13
Essay	Reports and presentations of essays proposed throughout the course during the internship sessions	15	A2 A3	B3 B4	C21 C25	D3 D4 D5 D6 D8 D11 D13

Other comments on the Evaluation

The evaluation of the course at the first opportunity will be carried out by Ongoing Assessment. Students who have a justification may officially waive the ongoing assessment and ask for a first oportunity final exam, on the official date. The grade obtained in this exam will represent 100% of the final grade. This exam may have a part to do in a computer room and / or laboratory. The waiver of ongoing assessment must be made during the first month of class. During this period, the justification of the resignation will be presented to the coordinator of the subject for evaluation.

To pass the course at the first opportunity, a score greater than 5 points out of 10 will be required in the continuous evaluation during the development of classes and the exam on the official date, toghether. The final grade will be obtained according to the indicated percentages.

Ongoing assessment is not passed in the following cases:

- The non-execution or delivery, without justification, of any of the items of the ongoing assessment (works reports, practicum reports, exams ...). In this case, the final grade reflected in the official record will be "not presented"

- Obtaining a grade of less than 5 points out of 10 in the final exam of ongoing assessment. In this case, the final grade reflected in the official record will be the grade of the ongoing assessment final exam.

The evaluation of the course in the second opportunity will be carried out in a final exam on the date set by the center. The grade obtained in this exam will represent 100% of the final grade. This exam may have a part to do in a computer room and / or laboratory.

To pass the subject in the second opportunity, a score higher than 5 points out of 10 will be required in the exam on the official date.

The evaluation test schedule officially approved by the EEAE Center Board is published on the website http://aero.uvigo.es/gl/docencia/exames

The maximum length of the exams will be 3 hours if there is no interruption, and 5 hours if there is an intermediate break (maximum 3 hours for each part).

Sources of information

Basic Bibliography

C. Cuerno Rejado, **Aeronavegabilidad y certificación de aeronaves**, 1, Paraninfo, 2008

F. de Florio, **Airworthiness. An introduction to aircraft certification and operations**, 3, Elsevier, 2016

H.A. Kinnison, **Aviation maintenance management**, 2, McGraw-Hill, 2013

EASA, **Especificaciones de Certificación europeas de EASA**,

FAA, **Regulaciones Federales de Aviación de la FAA (EE.UU.)**,

Complementary Bibliography

Recommendations

Subjects that it is recommended to have taken before

Aerospace technology/O07G410V01205
Air transport and airborne systems/O07G410V01404
Aerodynamics and aeroelasticity/O07G410V01923

Contingency plan

Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained
The proposed methodologies are maintained but carried out through the Remote Campus. The platform faitic will be used more intensively as reinforcement to ensure accessibility of the students to the contents of the subject.

* Teaching methodologies modified
Laboratory practices that require interaction with physical elements are replaced by other activities that can be carried out on the remote campus, such as work in groups.

* Contactless mechanism for student attention (tutorials)
The tutorials will place in the teacher's virtual office on the remote campus.

=== ADAPTATION OF THE EVALUATION ===
* Tests already carried out
The tests already carried out maintain their weight in the evaluation.

* Pending tests
Pending tests are planned and will be carried out using the Moodle platform and the remote campus, and they maintain their weight in the evaluation.