

Course guide 205255 - SV - Flight Simulation for Aeronautical Engineering

Last modified: 02/04/2024

Unit in charge: Teaching unit:	Terrassa School of Industria 748 - FIS - Department of I	al, Aerospace and Audiovisual Engineering Physics.
Degree:	BACHELOR'S DEGREE IN AE BACHELOR'S DEGREE IN AE	EROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject). EROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Optional subject).
Academic year: 2024	ECTS Credits: 3.0	Languages: English

LECTURER		
Coordinating lecturer:	Enrique José García Melendo	
Others:	Oriol Català Ginebreda	

PRIOR SKILLS

It is advisable to have taken the courses 220013 Vehicles Aeroespacials and 220008 Espai Aèri, Navegació i Infraestructures

TEACHING METHODOLOGY

In the content exposition sessions, the professor will introduce the theoretical bases of the subject, concepts, methods and results, illustrating them with convenient examples to facilitate their understanding, complementing the teaching with practices in a simulator on a PC .

The students, autonomously, must work on the material provided by the professor and the results from the work sessions in order to assimilate and fix concepts.

LEARNING OBJECTIVES OF THE SUBJECT

To understand how aeronautics works on a daily basis once aircraft, airspace and procedures have passed the design stage and are certified for operation.

To learn the air communication procedures, VFR traffic and IFR traffic and the documents that regulate them.

Students must acquire knowledge about the different types of navigation in different airspaces and know how to find the requirements applicable to the regulations.

Understand the basics of VFR and IFR aeronautical communications. Understand the basics of navigation and VFR procedures

Understand the basics of navigation and IFR procedures

Construction of traditional IFR and PBN procedures

Understand the interaction of aircraft with the different airspaces, with other aircraft and ATC control.

Basic Regulation

STUDY LOAD

Туре	Hours	Percentage
Self study	45,0	60.00
Hours large group	30,0	40.00

Total learning time: 75 h



CONTENTS

1. Introduction to air communications

Description:

1.1 Definitions

1.2 Phraseology

1.3 Communication procedures

Related activities: Theoretical lessons and communications practice.

Full-or-part-time: 12h 30m Theory classes: 5h Self study : 7h 30m

3. Fundamentals of airplane flight

Description:

2.1 Definitions2.2 Controls and flight mechanics2.3 Instruments2.4 Basic procedures

Related activities: Theoretical lectures and practice by using Flight Simulator

Full-or-part-time: 12h 30m Theory classes: 5h Self study : 7h 30m

3. Introduction to visual flight

Description:

3.1 Definitions and regulations

- 3.2 Visual airspaces
- 3.3 Visual navigation and ATC procedures
- 3.4 The visual traffic circuit
- 3.5 Visual cartography

Related activities: Theoretical lectures and practice by using Flight Simulator

Full-or-part-time: 12h 30m Theory classes: 5h Self study : 7h 30m



4. Introduction to instrumental flight

Description:

- 4.1 Definitions and regulations
- 4.2 Instrument airspaces
- 4.3 Instrument navigation and ATC procedures
- 4.4 Instrument flight phases: standard departures, standard arrivals, types of approaches and cruise
- 4.5 Instrumental cartography

Related activities: Theoretical lectures and practice by using Flight Simulator

Full-or-part-time: 12h 30m Theory classes: 5h Self study : 7h 30m

5. Regulatory framework

Description:

5.1 EASA air navigation regulations5.2 Application of the regulations to airlines, both in their structure and in their operations5.3 Structure of an airline and company typologies

Related activities:

Theoretical lectures and examples from real air companies.

Full-or-part-time: 12h 30m Theory classes: 5h Self study : 7h 30m

6. Building of IFR procedures

Description:

6.1 Study of Document 81686.2 Application of the regulations to airlines, both in their structure and in their operations6.3 Structure of an airline and company trace

6.3 Structure of an airline and company types

Related activities:

Theoretical lessons and explanation of practical cases in real companies.

Full-or-part-time: 12h 30m Theory classes: 5h Self study : 7h 30m



ACTIVITIES

Theory lectures

Description: Lecture where the most important theoretical concepts are explained

Specific objectives:

To understand the most important basic concepts with the help of the professor.

Material: Class notes at Atenea. Bibliography.

Full-or-part-time: 55h Theory classes: 10h Self study: 45h

Practice by using Flight Simulator

Specific objectives:

Understand the most important basic concepts of each module with practical activities using Flight Simulator.

Material: Class notes at Atenea. Bibliography.

Full-or-part-time: 16h Theory classes: 16h

Partial Exam

Description:

In this exam the studient's knowledge on the material lectured in modules 1, 2, and 3 will be tested.

Specific objectives:

Understand the most important basic concepts of each module with the help of the professor.

Material:

Non-programmable calculator and writing material.

Delivery: Written exam

Full-or-part-time: 2h Theory classes: 2h



Final Exam

Description:

In this exam the studient's knowledge on the material lectured in modules 4, 5, and 6, will be tested.

Specific objectives:

Understand the most important basic concepts of each module with the help of the professor.

Material:

Non-programmable calculator and writting material.

Delivery: Writting exam

Full-or-part-time: 2h Theory classes: 2h

GRADING SYSTEM

1. Partial exam (50%)

2. Final exam (50%)

The partial and final exams will be scheduled during school hours. All students who have obtained an unsatisfactory result, that is, those who want to improve their grade, may take the Reconduction Exam of the partial and final exams. The Reconduction Exam will take place on the day set by the Academic Calendar. The redirection exam may improve the grade for the subject but in no case may it reduce it.

EXAMINATION RULES.

Partial exams will be done individually. In none of these examinations the student will be allowed to use programmable calculators, notes or books.

BIBLIOGRAPHY

Basic:

- Conforti, Facundo. Navegación IFR y comunicaciones. Mar del Plata: Biblioteca Aeronàutica, 2021. ISBN 9789874214270.
- Conforti, Facundo. Navegación aérea: VFR IFR. Mar del Plata: Biblioteca Aeronáutica, 2020. ISBN 9798734087312.

- Conforti, Facundo. Comunicaciones aeronáuticas. Mar del Plata: Biblioteca Aeronáutica, 2021. ISBN 9798468912980.
- Abeyratne, Ruwantissa. Air navigation law [on line]. Berlin: Springer, 2012 [Consultation: 15/02/2023]. Available on:

https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=9729
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- Walmsley, Stephen. Principles of flight for the private pilot. Wroclaw: Amazon Fulfillment, 2021. ISBN 9798484540525.