

## 220065 - Introduction to Sailplanes

Coordinating unit:	205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit:	737 - RMEE - Department of Strength of Materials and Structural Engineering
Academic year:	2019
Degree:	BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Teaching unit Optional) BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional) BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Teaching unit Optional)
ECTS credits:	3
Teaching languages:	English

### Teaching staff

Coordinator: Rafael Weyler Pérez

Others: Rafael Weyler Pérez

### Requirements

**IMPORTANT:** Students must pay an extra payment for the flights (fuel and sailplane rent). As a guide, the price will be around 150 €, but this quantity is subject to change. The number of flights will be a minimum of two and a maximum of three. The exact price and number of flights will be defined at the beginning of the course.

### Degree competences to which the subject contributes

Specific:

3. GrETA/GrEVA - An understanding of how aerodynamic forces determine flight dynamics and the role of the different variables involved in flight.
1. GrEVA - An adequate understanding of the following, as applied to engineering: physical phenomena of flight, flight qualities and control, aerodynamic and propulsive forces, performance and stability.
4. GrETA/GrEVA - An understanding of the uniqueness of airports in terms of infrastructure, structures and operation
2. GrEVA - Applied knowledge of aerodynamics, mechanics and thermodynamics, flight mechanics, aircraft engineering (fixed-wing and rotary-wing), structural theory.

## 220065 - Introduction to Sailplanes

### Teaching methodology

The course is divided into parts:

#### Theory classes

Theory classes will prepare the student for a better understanding of the practical activities. In the theory classes, teachers will introduce the theoretical basis of the concepts related to sailplane usage from a practical point of view. The explanations will cover from theoretical flight conditions to some practical situations in which a pilot might become involved.

The activity 1 will be assignments and oral discussions.

#### Practical classes

In the practical classes, the student will experience some of the theoretical concepts. They will come into contact with real sailplanes and will carry out some flights. The activities and some of practical classes will be made on the aerodrome at the weekends.

The activity 2 will be:

- Individual flights in sailplanes (accompanied by an experienced pilot)
- Examine real sailplanes in service

**IMPORTANT:** Students must pay an extra payment for the flights (fuel and sailplane rent). As a guide, the price will be around 150 €, but this quantity is subject to change. The number of flights will be a minimum of two and a maximum of three. The exact price and number of flights will be defined at the beginning of the course.

### Learning objectives of the subject

This course is intended to introduce students into the engineering applications from the user point of view and not as an engineer, who does not necessarily have such training. This course will focus on a highly technical and specialized flight discipline such as gliding, in which almost everything is related to engineering. It is proposed to show the importance of proper communication, as well as how technical concepts must be properly summarized and transmitted in accordance with the purpose of the device designed. It is also of vital importance and at the same time is overlooked, the role of engineers have into the specification of user skills or the training they should receive in order to manage properly the designed devices. On the other hand, the knowledge of user's needs is of vital importance to make a good design. Understanding requirements, limitations and functionality are basic elements needed to design an aircraft.

The course will pay special attention on all these concepts. It will be organized into theoretical lectures and practical classes. The first one will explain basic concepts and how the glider or some of its components works. Practical classes are done in order to understand the importance of these concepts. In this classes the students will interact with the sailplane itself, including the basic flight experience.

### Study load

Total learning time: 75h	Hours large group:	30h	40.00%
	Self study:	45h	60.00%

## 220065 - Introduction to Sailplanes

### Content

<p>Module 1: Theoretical aspects</p>	<p>Learning time: 45h Theory classes: 20h Self study : 25h</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- Introduction to gliding</li> <li>- Basic knowledge of sailplanes</li> <li>- Principles of flight</li> <li>- Meteorology</li> <li>- Flight techniques</li> <li>- Special issues</li> </ul> <p>Related activities:</p> <ul style="list-style-type: none"> <li>- Theoretical sessions</li> <li>- Activity 1: Assignments</li> </ul>	
<p>Module 2: Applied activities</p>	<p>Learning time: 30h Theory classes: 10h Self study : 20h</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- Procedures</li> <li>- Handle the sailplanes</li> <li>- The flight on sailplanes</li> </ul> <p>Related activities:</p> <ul style="list-style-type: none"> <li>- Theoretical sessions</li> <li>- Practical sessions</li> <li>- Activity 2: Individual flights in sailplanes</li> </ul>	

### Qualification system

The final grade depends on the following assessment criteria:

- Activity 1, weight: 50 %
- Activity 2, weight: 50 %

## 220065 - Introduction to Sailplanes

### Bibliography

#### Complementary:

Pajno, Vittorio. *Sailplane design: a guide for students and designers: from drafting to flight test*. Roma: IBN, 2014. ISBN 9788875650926.

Reichmann, Helmut. *Cross-country soaring: a handbook for performance and competition soaring*. Santa Mónica: Thomson, 1978.