

## 300254 - EA-A - Airport Engineering

Coordinating unit:	300 - EETAC - Castelldefels School of Telecommunications and Aerospace Engineering		
Teaching unit:	748 - FIS - Department of Physics		
Academic year:	2018		
Degree:	BACHELOR'S DEGREE IN AEROSPACE SYSTEMS ENGINEERING (Syllabus 2015). (Teaching unit Compulsory) BACHELOR'S DEGREE IN AEROSPACE SYSTEMS ENGINEERINGS/BACHELOR'S DEGREE IN TELECOMMUNICATIONS SYSTEMS ENGINEERING - NETWORK ENGINEERING (AGRUPACIÓ DE SIMULTANEÏTAT) (Syllabus 2015). (Teaching unit Compulsory) BACHELOR'S DEGREE IN AEROSPACE SYSTEMS ENGINEERING/BACHELOR'S DEGREE IN TELECOMMUNICATIONS SYSTEMS ENGINEERING (Syllabus 2015). (Teaching unit Compulsory) BACHELOR'S DEGREE IN AEROSPACE SYSTEMS ENGINEERING/BACHELOR'S DEGREE IN NETWORK ENGINEERING (Syllabus 2015). (Teaching unit Compulsory)		
ECTS credits:	6	Teaching languages:	Catalan, Spanish

### Teaching staff

Coordinator:	Definit a la infoweb de l'assignatura.
Others:	Definit a la infoweb de l'assignatura.

### Prior skills

- Understanding of technical and regulatory texts in English.
- Fundamentals of teamwork.

### Requirements

- Prerequisite:
- Air Transport Infrastructures

### Degree competences to which the subject contributes

Specific:

1. CE 13 AERO. Comprender la singularidad de las infraestructuras, edificaciones y funcionamiento de los aeropuertos. (CIN/308/2009, BOE 18.2.2009)
2. CE 14 AERO. Comprender el sistema de transporte aéreo y la coordinación con otros modos de transporte. (CIN/308/2009, BOE 18.2.2009)
3. CE 17 AERO. Conocimiento adecuado y aplicado a la ingeniería de: Los elementos fundamentales de los diversos tipos de aeronaves ; los elementos funcionales del sistema de navegación aérea y las instalaciones eléctricas y electrónicas asociadas; los fundamentos del diseño y construcción de aeropuertos y sus diversos elementos. (CIN/308/2009, BOE 18.2.2009)
4. CE 21 AEROP. Conocimiento adecuado y aplicado a la Ingeniería de: La normativa específica de edificación; los procedimientos de control y ejecución de obras; el funcionamiento y la gestión del aeropuerto y el transporte aéreo. (CIN/308/2009, BOE 18.2.2009)
5. CE 22 AEROP. Conocimiento adecuado y aplicado a la Ingeniería de: Los métodos de cálculo y de desarrollo de las diferentes soluciones de edificación y pavimentación de aeropuertos; el cálculo de los sistemas específicos de los aeropuertos y sus infraestructuras; la evaluación de las actuaciones técnicas y económicas de las aeronaves; el manejo de las técnicas experimentales, equipamiento e instrumentos de medida propios de la disciplina; las técnicas de inspección, de control de calidad y de detección de fallos; los planes de seguridad y control en aeropuertos. (CIN/308/2009, BOE 18.2.2009)

Transversal:

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6. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.
7. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
8. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.
9. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1. Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.
10. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
11. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.
12. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
13. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.
14. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.
15. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.

### Teaching methodology

The teaching methodology is based on:

- Theoretical lectures where the teacher presents the content of the subject-matter. These explanations are combined with exercises and case studies presented to students in order to complement the theoretical explanations with practical.
- Cooperative learning in which students work in groups to solve in class under teacher supervision, case studies that the teacher pose.
- Independent learning in which students work on class material at home and perform the proposed tasks in class, for example, technical readings and resolution of issues and problems individually or in groups.

### Learning objectives of the subject

At the end of the Airport engineering course / student should be able to:

- Understand the concept of airport system.
- Define the elements of an airport.
- Identify the agents involved in an airport.
- Determine, based on the concepts of airport system, airport and its users, the most appropriate configuration for a given airport.
- Use available resources and rules for design an airport
- Have basic knowledge of airport construction.

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### Study load

Total learning time: 112h 30m	Hours large group:	19h 30m	17.33%
	Hours medium group:	19h 30m	17.33%
	Hours small group:	0h	0.00%
	Guided activities:	10h 30m	9.33%
	Self study:	63h	56.00%

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### Content

<p><b>INTRODUCTION</b></p>	<p>Learning time: 7h Theory classes: 1h 30m Practical classes: 1h 30m Self study : 4h</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- Description of the concept of airport and its elements. Relation with other transports.</li> <li>- Departure-arrival process</li> <li>- Types of airports</li> </ul>	
<p><b>AIRCRAFT CHARACTERISTICS RELATED TO AIRPORT DESIGN</b></p>	<p>Learning time: 23h 30m Theory classes: 3h Practical classes: 4h 30m Guided activities: 3h Self study : 13h</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- Characteristics of the aircraft and its influence on the design and operation of an airport.</li> <li>- Aircraft evolution. Past, present and future.</li> <li>- Aircraft performance characteristics. Declared distances.</li> <li>- Aircraft classification.</li> <li>- Aircraft Characteristics for Airport Planning.</li> </ul> <p>Related activities:</p> <p>Exercises.</p> <p>Driven Activity 1. Study of a route between two airports.</p>	

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<p><b>AIRPORT SYSTEM</b></p>	<p>Learning time: 12h 30m            Theory classes: 3h            Practical classes: 1h 30m            Guided activities: 1h            Self study : 7h</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- General configuration of the airport system.</li> <li>- Airport infrastructure.</li> <li>- Airside /Landside.</li> <li>- Buildings in Airports: Terminal Building, SEI, etc..</li> <li>- Accessibility.</li> <li>- Other infrastructures.</li> <li>- Airport and region</li> <li>- Airport and Air Navigation.</li> </ul> <p>Related activities: Exercises.</p> <p>Driven Activity 2: Identification of main elements of the airport system.</p>	
<p><b>AIRFIELD</b></p>	<p>Learning time: 19h 30m            Theory classes: 3h            Practical classes: 3h            Guided activities: 2h 30m            Self study : 11h</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- Configuration and design of the airfield in an airport</li> <li>- Maneuvering area and movement area.</li> <li>- Runways, taxiways, apron, others.</li> <li>- Markings</li> <li>- Lighting and markers</li> <li>- Visuals approach systems</li> </ul> <p>Related activities: Exercises.</p> <p>Driven Activity 3: Geometric design of a runway</p>	

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<p><b>OBSTACLE LIMITATION SURFACES</b></p>	<p>Learning time: 14h Theory classes: 1h 30m Practical classes: 3h 30m Guided activities: 1h Self study : 8h</p>
<p>Description: - Obstacle limitation surfaces - Obstacle limitation</p> <p>Related activities: Exercises.</p> <p>Driven Activity 4: Identification of Obstacle Limitation Surfaces at an airport</p>	
<p><b>PASSENGER TERMINAL BUILDING</b></p>	<p>Learning time: 3h 30m Theory classes: 1h 30m Self study : 2h</p>
<p>Description: Description of main elements in a passenger terminal building. Basic designs of terminal building and design requirements.</p>	
<p><b>PAVEMENTS</b></p>	<p>Learning time: 21h 30m Theory classes: 3h Practical classes: 4h Guided activities: 2h 30m Self study : 12h</p>
<p>Description: - Type of airport pavements: rigid, flexible, critical and non-critical. - Pavement thicknesses calculation. - Pavement construction.</p> <p>Related activities: Exercises.</p> <p>Driven Activity 5: Pavements calculation of an airport.</p>	

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AIRPORT CONSTRUCTION	Learning time: 10h 30m Theory classes: 3h Practical classes: 1h 30m Self study : 6h
<p>Description:</p> <p>Description of the construction of airport projects and their peculiarities.</p> <ul style="list-style-type: none"><li>- Project of an airport construction.</li><li>- Machinery.</li><li>- Construction of an airport.</li><li>- Operation.</li><li>- Accommodation works.</li><li>- Works direction.</li><li>- Safety.</li></ul>	

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### Planning of activities

EXAM 1	Hours: 1h 30m Theory classes: 1h 30m
<p><b>Description:</b> Under the heading of individual student assessment, there will be a half-term examination which will assess the contents of the subject developed so far. Questions may be theoretical or practical application of the content.</p> <p><b>Support materials:</b> Calculator and additional documentation provided during the exam.</p> <p><b>Descriptions of the assignments due and their relation to the assessment:</b> Exam adequately resolved by the student.</p> <p><b>Specific objectives:</b> It aims to assess the following skills:</p> <p>Specific CE13, CE14, CE17, CE21, CE22 Generic: CG3, CG4, CG6, CG7</p>	
EXAM 2	Hours: 1h 30m Theory classes: 1h 30m
<p><b>Description:</b> Under the heading of individual student assessment, there will be an end of term exam which will be assessed on the contents of the subject developed throughout the course. Questions may be theoretical or practical application of the content.</p> <p><b>Support materials:</b> Calculator and additional documentation provided during the exam.</p> <p><b>Descriptions of the assignments due and their relation to the assessment:</b> Exam adequately resolved by the student.</p> <p><b>Specific objectives:</b> It aims to assess the following skills:</p> <p>Specific CE13, CE14, CE17, CE21, CE22 Generic: CG3, CG4, CG6, CG7</p>	
CONTROL EXAM 1	Hours: 1h Theory classes: 1h
<p><b>Description:</b> Under the heading of individual student assessment, there will be a control exam in class time the week before half term for assessing the knowledge in the contents of the subject developed so far. The questions will be theoretical.</p> <p><b>Support materials:</b> No material allowed.</p>	

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Descriptions of the assignments due and their relation to the assessment:  
Control exam adequately resolved by the student.

Specific objectives:

It aims to assess the following skills:

Specific CE13, CE14, CE17, CE21, CE22

Generic: CG3, CG4, CG6, CG7

### CONTROL EXAM 2

Hours: 1h

Theory classes: 1h

Description:

Under the heading of individual student assessment, there will be a control exam in class time the week before the end of term for assessing the knowledge in the contents of the subject developed so far. The questions will be theoretical.

Support materials:

No material allowed.

Descriptions of the assignments due and their relation to the assessment:  
Control exam adequately resolved by the student.

Specific objectives:

It aims to assess the following skills:

Specific CE13, CE14, CE17, CE21, CE22

Generic: CG3, CG4, CG6, CG7

### CLASS PROBLEMS

Hours: 19h 30m

Practical classes: 19h 30m

Description:

Students will solve in class by groups or individually, as appropriate, exercises and problems on the course contents. Students will be mentored and advised by teachers during the resolution of the problems.

Support materials:

Class notes and additional material supplied.

Descriptions of the assignments due and their relation to the assessment:  
Solved problems.

Specific objectives:

It aims to assess the following skills:

Specific CE13, CE14, CE17, CE21, CE22

Generic: CG3, CG4, CG5, CG6, CG7

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<p><b>SELF-LEARNING PROBLEMS</b></p>	<p>Hours: 10h Self study: 10h</p>
<p><b>Description:</b> Students will solve in groups or individually, as appropriate, exercises and problems on the course content outside of class time, through self-learning.</p> <p><b>Support materials:</b> Class notes and additional material considered by the student.</p> <p><b>Descriptions of the assignments due and their relation to the assessment:</b> Solved problems.</p> <p><b>Specific objectives:</b> It aims to assess the following skills:</p> <p>Specific CE13, CE14, CE17, CE21, CE22 Generic: CG3, CG4, CG5, CG6, CG7</p>	
<p><b>MENTORING ACTIVITIES</b></p>	<p>Hours: 10h Guided activities: 10h</p>
<p><b>Description:</b> There will be proposed in class case studies based on real cases and projects that students must solve. These are discussed in class results and the methodology applied.</p> <p><b>Support materials:</b> Class notes and additional material supplied.</p> <p><b>Descriptions of the assignments due and their relation to the assessment:</b> Solved activities.</p> <p><b>Specific objectives:</b> It aims to assess the following skills:</p> <p>Specific CE13, CE14, CE17, CE21, CE22 Generic: CG3, CG4, CG5, CG6, CG7</p>	

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### Qualification system

The final grade for the course (weighted out of 10), CF is obtained as follows:

$$CF = 0.20 AE1 + 0.1 AE2 + 0.3 AD3 + 0.1 AE4 + 0.3 AE5$$

Where:

AE1: half a term exam score

AE2: 1st control score

AD3: score of the problems done in class and guided activities

AE4: 2nd control score

AE5: final term exam score

### Regulations for carrying out activities

Before the completion of each test specifying rules will be done.

### Bibliography