

## 300213 - ITA - Air Transport Infrastructure

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:	7,5	Teaching languages:	Catalan, Spanish, English

### Teaching staff

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

### Prior skills

x

### Requirements

x

### 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 19 AERO. Conocimiento aplicado de: la ciencia y tecnología de los materiales; mecánica y termodinámica; mecánica de fluidos; aerodinámica y mecánica del vuelo; sistemas de navegación y circulación aérea; tecnología aeroespacial; teoría de estructuras; transporte aéreo; economía y producción; proyectos; impacto ambiental. (CIN/308/2009, BOE 18.2.2009)
5. CE 9 AERO. Comprender la globalidad del sistema de navegación aérea y la complejidad del tráfico aéreo. (CIN/308/2009, BOE 18.2.2009)

Generical:

8. PROJECT MANAGEMENT - Level 2: Define the objectives of a well-defined, narrow scope, and plan development, identifying resources, tasks, shared responsibilities and integration. Use appropriate tools to support project management.
12. EFFICIENT USE OF EQUIPMENT AND INSTRUMENTS - Level 2: Use the correct instruments, equipment and laboratory software for specific or specialized knowledge of their benefits. A critical analysis of the experiments and results. Correctly interpret manuals and catalogs. Working independently, individually or in groups, in the laboratory.

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### Transversal:

- 6. 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.
- 7. 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.
- 9. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 2. Applying sustainability criteria and professional codes of conduct in the design and assessment of technological solutions.
- 10. 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.
- 11. 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.
- 13. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2. Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.

### Teaching methodology

x

### Learning objectives of the subject

x

### Study load

Total learning time: 187h 30m	Hours large group:	0h	0.00%
	Hours medium group:	0h	0.00%
	Hours small group:	56h 30m	30.13%
	Guided activities:	26h	13.87%
	Self study:	105h	56.00%

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### Content

<p>(ENG) Títol contingut 1: CNS/ATM (Communications Navigation Surveillance for ATM)</p>	<p>Learning time: 37h Laboratory classes: 6h Guided activities: 10h Self study : 21h</p>
<p>Description: (ENG) · Comunicacions: VHF, HF, 8,33 khz, CPDLC. SITA/ARINC. · Navigation: Radioajudes i GNSS. RNAV. · Surveillance: PSR, SSR, ADS. · Criteris econòmics i operatius de l'emplaçament de sistemes CNS. · Manteniment i inspecció (a terra i en vol) de sistemes CNS. · Separation and collision avoidance (ACAS/ASAS).</p> <p>Related activities: (ENG) Activitat 1: Introducció a les infraestructures del transport aeri.</p>	
<p>(ENG) Títol contingut 2: Espai aeri i procediments de vol</p>	<p>Learning time: 74h Laboratory classes: 12h Guided activities: 20h Self study : 42h</p>
<p>Description: (ENG) · Estructuració i configuració de l'espai aeri: Regles de vol. Classes d'espai aeri. Zones de control. Zones R/D/P. FIR/UIR. · Indicadors de capacitat, seguretat i eficiència. · Procediments de vol: Aerovies. SIDs, STARS i aproximacions (precisió, no precisió, APV). Cartes aeronàutiques. · Pla de vol ATC (aïllat i repetitiu) · Flexible Use of Airspace (FUA) · Reduced Vertical Separation Minima (RVSM) · Criteris generals per al disseny de procediments instrumentals. Marge de superació d'obstacles. Superfícies limitadores. · Disseny de procediments de sortida i arribada · Disseny de procediments d'aproximació instrumentals · Disseny de procediments RNAV</p> <p>Related activities: (ENG) Activitat 1: Introducció a les infraestructures del transport aeri. Activitat 2: Projecte. Activitat 3: Disseny de procediments.</p>	

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<p>(ENG) Títol contingut 3: Els serveis de la circulació aèria</p>	<p>Learning time: 76h 30m Laboratory classes: 13h Guided activities: 21h 30m Self study : 42h</p>
<p>Description:</p> <p>(ENG) · Servei d'informació aeronàutica (AIP, NOTAM, Circulars...)</p> <ul style="list-style-type: none"> <li>· Serveis de Gestió del Trànsit Aeri</li> <li>· Airspace Management. Sectorització, creació de rutes i procediments.</li> <li>· Air Traffic Flow and Capacity Management: CFMU. Balanç capacitat/demanda. Tècniques i algorismes d'assignació de fluxos. Assignació, revisió i cancel·lació de Slots.</li> <li>· Air Traffic Services: Servei d'alerta, servei d'informació de vol, servei de</li> <li>· Control de torre i d'aeròdrom. Control d'àrea terminal. Control de ruta. Control oceànic</li> <li>· Separació d'aeronaus (aeròdrom i ruta), mètodes, mínims, anàlisis i simulacions.</li> <li>· Dependències, estructura i coordinació dels serveis ATC. Coordinació civil/militar.</li> <li>· Servei d'informació d'aeròdrom (AFIS) control.</li> <li>· Collaborative Decision Making (CDM).</li> </ul> <p>Related activities:</p> <p>(ENG) Activitat 1: Introducció a les infraestructures del transport aeri. Activitat 2: Projecte.</p>	

### Planning of activities

<p>(ENG) TÍTOL ACTIVITAT 1: INTRODUCCIÓ A LES INFRAESTRUCTURES DEL TRANSPORT AERI</p>	<p>Hours: 40h Laboratory classes: 10h Guided activities: 10h Self study: 20h</p>
<p>(ENG) TÍTOL ACTIVITAT 2: PROJECTE</p>	<p>Hours: 102h 30m Laboratory classes: 30h 30m Guided activities: 12h Self study: 60h</p>
<p>(ENG) TÍTOL ACTIVITAT 3: PROJECTE DE DISSENY DE PROCEDIMENTS</p>	<p>Hours: 45h Laboratory classes: 10h Guided activities: 10h Self study: 25h</p>

### Qualification system

x

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### Regulations for carrying out activities

x

### Bibliography

#### Basic:

Cook, A. European air traffic management : principles, practice and research. Aldershot: Ashgate, 2008. ISBN 9780754672951.

Federal Aviation Administration. Instrument procedures handbook. Oklahoma City: U.S. Department of Transportation, Federal Aviation Administration, Flight Procedure Standards Branch, 2007. ISBN 9781560276869.

Federal Aviation Administration. Instrument flying handbook. Washington: U.S. Department of Transportation, Federal Aviation Administration, Flight Procedure Standards Branch, 2012. ISBN 9781619540224.

Sáez Nieto, Francisco Javier; Pérez Sanz, Luis; Gómez Comendador, Víctor Fernando. La navegación aérea y el aeropuerto. Madrid: Fundacion Aena, 2002. ISBN 8495567091.

Brenlove, Milovan S. The Air traffic system : a commonsense guide. 2nd ed. Ames: Iowa State Press, 2003. ISBN 0813829607.

#### Complementary:

Galotti, Vincent P. The Future air navigation system (FANS): communication, navigation, surveillance, air traffic management. Aldershot, England: Avebury Aviation, 1997. ISBN 0291398332.

Nolan, Michael S. Fundamentals of air traffic control. 4th ed. Belmont, CA: Thomson Brooks/Cole, 2004. ISBN 0534393756.

Ontiveros, Jorge. Descubrir el control aéreo. 2ª ed. Madrid: Centro de Documentación y Publicaciones de Aena, 2003. ISBN 8495135787.

Bianco, Lucio; Odoni, Amedeo R. New concepts and methods in air traffic management. Berlin: Springer, 2001. ISBN 3540416374.

Isaac, Anne R; Ruitenber, Bert. Air traffic control: human performance factors. Aldershot ; Brookfield, Vt.: Ashgate, 1999. ISBN 0291398545.

Bianco, Lucio; Dell'Olmo, Paolo; Odoni, Amadeo R. Modelling and simulation in air traffic management. Berlin, (etc.): Springer, 1997. ISBN 3540630937.

Aircraft operations : procedures for air navigation services. 5th ed. Montreal [etc.]: International Civil Aviation Organization, 2006. ISBN 9291948632.