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300420 - ATM-OA - Sesar: Single European Sky ATM Research

Coordinating unit: 300 - EETAC - Castelldefels School of Telecommunications and Aerospace Engineering

Teaching unit: 701 - AC - Department of Computer Architecture

Academic year: 2018

Degree: BACHELOR'S DEGREE IN AIR NAVIGATION ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN AEROSPACE SYSTEMS ENGINEERING (Syllabus 2015). (Teaching unit Optional)
BACHELOR'S DEGREE IN AIRPORT ENGINEERING (Syllabus 2010). (Teaching unit Optional)

ECTS credits: 6 Teaching languages: English

Teaching staff

Coordinator: Definit a la infoweb de l'assignatura.

Others: Definit a la infoweb de l'assignatura.

Prior skills

English

Degree competences to which the subject contributes

Specific:

1. CE 9 AERO. Comprender la globalidad del sistema de navegación aérea y la complejidad del tráfico aéreo. (CIN/308/2009, BOE 18.2.2009)

Transversal:

2. 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.
3. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

Teaching methodology

Exposition classes and actitivities

Learning objectives of the subject

At the end of the course the student should be able to:
- Explain the meaning od 4D trajectories, network operations, SWIM, CDM and traffic sincronization.
- Identify novelties and contributions in research articles on ATM.
- Use/develop evaluation tools to measure the efficiency of the air space
- Determine, from SESAR offcial documents, the advantages and inconvenients of the different research contributions.
- Sintetize in a research paper some novel ideas on air traffic management, aply methods to test the ideas and present the results

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Study load

Total learning time: 150h	Hours large group:	26h	17.33%
	Hours small group:	26h	17.33%
	Guided activities:	14h	9.33%
	Self study:	84h	56.00%

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Content

(ENG) Introduction to research

Learning time: 9h

Theory classes: 1h
Laboratory classes: 2h
Guided activities: 1h
Self study : 5h

Related activities:
(ENG) A0, A1

(ENG) Organization of SESAR JU

Learning time: 3h 30m

Theory classes: 1h
Self study : 2h 30m

Description:
(ENG) Institutions involved in the Joint Undertaking. Budged. Projects. Stakeholders

Related activities:
(ENG) A0, E1

(ENG) Current and future air traffic

Learning time: 24h 30m

Theory classes: 4h
Laboratory classes: 4h
Guided activities: 2h
Self study : 14h 30m

Description:
(ENG) Definition phase outcomes. Current situation. Performace objectives. ConOps.

Related activities:
(ENG) A0, A2, A3, E1

(ENG) Complexity theory

Learning time: 13h 30m

Theory classes: 2h
Laboratory classes: 2h
Guided activities: 1h
Self study : 8h 30m

Description:
(ENG) Emerging behaviours. Complexity models. Simulation.

Related activities:
(ENG) A0, A4, E1

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(ENG) Functional Airspace Blocks	Learning time: 24h 30m Theory classes: 4h Laboratory classes: 4h Guided activities: 2h Self study : 14h 30m

Description:
(ENG) Dynamic sectorization

Related activities:
(ENG) A0, A5, E2

(ENG) Business Trajectory Management	Learning time: 19h 30m Theory classes: 1h Laboratory classes: 4h Guided activities: 2h Self study : 12h 30m

Description:
(ENG) Sharing of trajectories. Trajectory negotiation. Business/mission trajectories. Precission of trajectories. Planning of aerial operations

Related activities:
(ENG) A0, A6, E2

(ENG) Flight synchronization	Learning time: 21h 30m Theory classes: 3h Laboratory classes: 4h Guided activities: 2h Self study : 12h 30m

Description:
(ENG) Contracts for trajectory execution. Controlled Time of Arrivals/Over. Multiples TCA/TCOs

Related activities:
(ENG) A0, A6, E2

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(ENG) Ground flight information systems	Learning time: 8h 30m Theory classes: 6h Self study : 2h 30m

Description:
(ENG) Aeronautic datalinks: air/air, air/ground, ground/ground. Information systems. Tools for colaborative decission.

Related activities:
(ENG) A0, E1

(ENG) Conflict Automation	Learning time: 22h 30m Theory classes: 4h Laboratory classes: 4h Guided activities: 2h Self study : 12h 30m

Description:
(ENG) Predicction of separation conflicts. Resolution advisory. Tools for automation and human decission suport.

Related activities:
(ENG) A0, A6, E2

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Planning of activities

A0	Hours: 26h Theory classes: 26h

Description:
Attend to lectures

Support materials:
Slides

Descriptions of the assignments due and their relation to the assessment:
none

Specific objectives:
Theory

A1	Hours: 8h Laboratory classes: 2h Guided activities: 1h Self study: 5h

Description:
Research activity

Support materials:
Atenea

Descriptions of the assignments due and their relation to the assessment:
D1 (5%)

Specific objectives:
Practic knowledge

A2	Hours: 9h Laboratory classes: 2h Guided activities: 1h Self study: 6h

Description:
Flight Data Parsing

Support materials:
Atenea

Descriptions of the assignments due and their relation to the assessment:
D2 (5%)

Specific objectives:
Data processing

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A3	Hours: 9h Laboratory classes: 2h Guided activities: 1h Self study: 6h

Description:
Airspace performance indicators

Support materials:
Same as A2

Descriptions of the assignments due and their relation to the assessment:
D3 (5%)

Specific objectives:
Data processing and validation

A4	Hours: 9h Laboratory classes: 2h Guided activities: 1h Self study: 6h

Description:
Network Simulations

Support materials:
Same as A2 plus processing tool

Descriptions of the assignments due and their relation to the assessment:
D4 (5%)

Specific objectives:
Learning of processing tool

A5	Hours: 21h Laboratory classes: 6h Guided activities: 3h Self study: 12h

Description:
Practice of dynamic sectoring

Support materials:
Atenea

Descriptions of the assignments due and their relation to the assessment:
D5 (15%)

Specific objectives:
Practics and Theoretical knowledge. CE9

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A6	Hours: 48h Laboratory classes: 12h Guided activities: 6h Self study: 30h

Description:
Project on future ATM

Support materials:
Atenea

Descriptions of the assignments due and their relation to the assessment:
D6 (25%)

Specific objectives:
Practic and theoretic knwoledge. CE9.

E1	Hours: 10h Self study: 10h

Description:
Exam 1

Support materials:
Bibliography

Descriptions of the assignments due and their relation to the assessment:
C1 (20%)

Specific objectives:
Validation of ackquired knowledge

E2	Hours: 10h Self study: 10h

Qualification system

weighted mean within actitivities

Regulations for carrying out activities

Individual

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Bibliography

Basic:

ICAO. Global air traffic management operational concept. Montreal: ED. International Civil Aviation Organization, 2005. ISBN 9789291945542.