Last update: 05-10-2018

220323 - Airport Building Systems

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering

Teaching unit: 709 - EE - Department of Electrical Engineering

Academic year: 2018

Degree: MASTER'S DEGREE IN AERONAUTICAL ENGINEERING (Syllabus 2014). (Teaching unit Optional)
MASTER'S DEGREE IN SPACE AND AERONAUTICAL ENGINEERING (Syllabus 2016). (Teaching unit Optional)

ECTS credits: 5 Teaching languages: English

Teaching staff

Coordinator: Núria Forcada, Santiago Bogarra

Others: Antoni Garcia, Jordi Roger Riba

Degree competences to which the subject contributes

Specific:

CEEAEROP1. MUEA/MASE: The ability to analyse airport operations, planning and air transport (specific competency for the specialisation in Airports).
CEEAEROP2. MUEA/MASE: The ability to design and calculate airport installations (specific competency for the specialisation in Airports).
CEEAEROP3. MUEA/MASE: The ability to apply analytical and business management techniques to aeronautical companies (specific competency for the specialisation in Airports).

Teaching methodology

The course is divided into parts:
Theory classes
Practical classes
Self-study for doing exercises and activities.
In the theory classes, teachers will introduce the theoretical basis of the concepts, methods and results and illustrate them with examples appropriate to facilitate their understanding.
In the practical classes (in the classroom), teachers guide students in applying theoretical concepts to solve problems, always using critical reasoning. We propose that students solve exercises in and outside the classroom, to promote contact and use the basic tools needed to solve problems.
Students, independently, need to work on the materials provided by teachers and the outcomes of the sessions of exercises/problems, in order to fix and assimilate the concepts.
Students will work in small groups to apply concepts to given examples, in selecting and analysing building systems.
The teachers provide the syllabus and monitoring of activities (by ATENEA).

Learning objectives of the subject

Ability to apply knowledge to solve problems in new environments.
Self-learning capacity to independent continuous training.
Ability to work in small groups to provide input and solve assigned specific objectives for each phase of class exercises.
Student to demonstrate time management skills by completion of exercises by assigned deadlines and by meeting specific objectives for each phase of class exercises.

Last update: 05-10-2018

220323 - Airport Building Systems

Study load

Total learning time: 125h	Hours large group:	30h	24.00%
	Hours small group:	15h	12.00%
	Self study:	80h	64.00%

Last update: 05-10-2018

220323 - Airport Building Systems

Content

Module 1: HVAC Systems

Learning time: 25h

Theory classes: 6h
Practical classes: 3h
Self study : 16h

Description:
Thermal comfort, psychometrics, heat transfer, thermal resistance, infiltration and ventilation, climate, solar geometry, passive heating, active heating, passive cooling, air conditioning, air distribution and HVAC concepts.

Related activities:
Exam
Exercises (Part 1)

Module 2: Mechanical Systems

Learning time: 37h 30m

Theory classes: 9h
Practical classes: 4h 30m
Self study : 24h

Description:
Plumbing Systems including (cold and hot water).
Renewable energies (solar).
Sewage systems (including rain water drainage and sewage).
Fire protection measures (hydrants, sprinklers, etc.).

Related activities:
Exam
Exercises (Part 1)

Module 3: Electric Distribution Systems

Learning time: 29h 30m

Theory classes: 9h
Practical classes: 4h 30m
Self study : 16h

Description:
Lighting Systems for an Indoor Area.
Requirements for electrical installations.
Electric Cables.
Distribution-System Protection.
System Grounding.
Sizing a Power Distribution System.

Related activities:
Exam
Exercises (Part 2)

Last update: 05-10-2018

220323 - Airport Building Systems

Module 4: Electric Generation Systems	Learning time: 33h Theory classes: 6h Practical classes: 3h Self study : 24h

Description:
Generation of Electric Power.
Solar Electric Systems.
Cogeneration.
Power generator.
Stationary Batteries.
Uninterruptible Power Supply.
Power Transformers.

Related activities:
Exam
Exercises (Part 2)

Qualification system

The final grade depends on:
- Exam 1 (HVAC, water and sewerage systems, fire protection systems): weight 25%
- Exam 2 (lighting and electricity): weight 25%
- Exercises (part 1) weight 25%
- Exercises (part 2) weight 25%

There will be a final Activity to repeat the assessment of the exam.

For those students who meet the requirements and submit to the reevaluation examination, the grade of the reevaluation exam will replace the grades of all the on-site written evaluation acts (tests, midterm and final exams) and the grades obtained during the course for lab practices, works, projects and presentations will be kept.
If the final grade after reevaluation is lower than 5.0, it will replace the initial one only if it is higher. If the final grade after reevaluation is greater or equal to 5.0, the final grade of the subject will be pass 5.0.

Last update: 05-10-2018

220323 - Airport Building Systems

Bibliography

Basic:

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Reglamento de instalaciones térmicas en los edificios RITE [on line]. 5ª ed. Madrid: Paraninfo, 2008 [Consultation: 13/12/2016]. Available on: <http://www.minetad.gob.es/energia/desarrollo/EficienciaEnergetica/RITE/Reglamento/RDecreto-1027-2007-Consolidado-9092013.pdf>. ISBN 9788428330206.

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Others resources:

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Línies de transport d?energia. Luis M. Checa. Ed. Marcombo, 1988.
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Proteccions en les instal·lacions elèctriques.. Paulino Montané. Ed. Marcombo. 1999