220325 - Air Transport

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 732 - OE - Department of Management
Academic year: 2017
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: Oriol Lordan

Degree competences to which the subject contributes

Specific:
- CEEAERP3. MUEA/MASE: The ability to apply analytical and business management techniques to aeronautical companies (specific competency for the specialisation in Airports).
- CEEAERP2. MUEA/MASE: The ability to design and calculate airport installations (specific competency for the specialisation in Airports).
- CEEAERP1. MUEA/MASE: The ability to analyse airport operations, planning and air transport (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.
The teachers provide the syllabus and monitoring of activities (by ATENEA).

Learning objectives of the subject

The course Air Transport introduces students to the concepts, principles and fundamentals of optimization problems for analysis and decision-making of airline operations and scheduling such as fleet assignment, aircraft routing, crew scheduling and manpower planning.
### Study load

<table>
<thead>
<tr>
<th>Total learning time: 125h</th>
<th>Hours large group:</th>
<th>30h</th>
<th>24.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours small group:</td>
<td>15h</td>
<td>12.00%</td>
</tr>
<tr>
<td></td>
<td>Self study:</td>
<td>80h</td>
<td>64.00%</td>
</tr>
</tbody>
</table>
# Module 1: Introduction

**Description:**
- Graph theory and integer linear models
  - Graph basics
  - Graph topology
  - Basic graph problems used in air transport
  - Basic ILP used in air transport
- Flight scheduling

**Learning time:** 13h 20m  
Theory classes: 3h 20m  
Laboratory classes: 1h 40m  
Self study: 8h 20m

## Module 2: Fleet assignment

**Description:**
- Introduction
- Fleet assignment problem
- Fleet assignment linear model

**Related activities:**
Activity 1
Project, part 1

**Learning time:** 27h 55m  
Theory classes: 6h 40m  
Laboratory classes: 3h 20m  
Self study: 17h 55m

## Module 3: Aircraft Routing

**Description:**
- Introduction
- Aircraft Routing problem
- Aircraft Routing linear model

**Related activities:**
Activity 2
Project, part 1

**Learning time:** 27h 55m  
Theory classes: 6h 40m  
Laboratory classes: 3h 20m  
Self study: 17h 55m
Module 4: Crew Scheduling

Description:
- Introduction
- Crew pairing problem
- Crew pairing linear model
- Crew rostering problem
- Crew rostering linear model

Related activities:
Activity 3
Project, part 2

Module 5: Manpower planning

Description:
- Introduction
- Manpower Planning problem
- Manpower Planning linear model

Related activities:
Activity 4
Project, part 2

Qualification system

The final grade depends on the following assessment criteria:
Activities 1-4: Activities in class, weight: 60% (15% each)
Project, parts 1-2: Project in groups, weight: 40% (20% each)
**220325 - Air Transport**

**Bibliography**

**Basic:**


**Complementary:**

