Course guide
220321 - 220321 - Airport Operations

Last modified: 11/04/2025

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 220 - ETSEIAT - Terrassa School of Industrial and Aeronautical Engineering.

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

Academic year: 2025 **ECTS Credits:** 5.0 **Languages:** English

LECTURER

Coordinating lecturer: Lordan Gonzalez, Oriol

Others:

PRIOR SKILLS

Students must have a good knowledge of R and data.table package (taught in 220309 - Transport Aeri i Sistemes de Navegació).

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CEEAEROP3. MUEA/MASE: The ability to apply analytical and business management techniques to aeronautical companies (specific competency for the specialisation in Airports).
CEEAEROP1. 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

This course introduces the concepts, principles and fundamentals of optimization problems for analysis and decision-making of airport operations such as runway sequencing and stand allocation. Moreover, we will introduce handling operations from a business perspective.

STUDY LOAD

Type	Hours	Percentage
Hours small group	15,0	12.00
Self study	80,0	64.00
Hours large group	30,0	24.00

Total learning time: 125 h

CONTENTS

Module 1: Runway sequencing

Description:
In this module we will learn to sequence aircrafts at the runway

Related activities:
Assignment 1
Assignment 2

Full-or-part-time: 31h 15m
Theory classes: 7h 30m
Laboratory classes: 3h 45m
Self study : 20h

Module 2: Stand allocation

Description:
In this module we will learn to assign aircraft operations to parking positions

Related activities:
Assignment 3
Assignment 4p1
Assignment 4p2

Full-or-part-time: 62h 30m
Theory classes: 15h
Laboratory classes: 7h 30m
Self study : 40h

Module 3: Handling operations

Description:
In this module we will learn the following procedures:
- Ramp operations
- Flight dispatching
- Passenger assistance

Related activities:
Assignment 5
Assignment 6

Full-or-part-time: 31h 15m
Theory classes: 7h 30m
Laboratory classes: 3h 45m
Self study : 20h

GRADING SYSTEM

The final grade depends on the following assessment criteria:

Assignment 1: 5%
Assignment 2: 20%
Assignment 3: 5 %
Assignment 4p1: 25%
Assignment 4p2: 20%
Assignment 5: 5%
Assignment 6: 20%

As there are no written tests, there won't be any exam to retake.

BIBLIOGRAPHY

Basic:
- Yu, Gang. Operations research in the airline industry. [Boston] : New York: Kluwer Academic Publishers ; Springer Science+Business Media, 1998. ISBN 9781461375135.