

## Air transport

Academic Year: ( 2017 / 2018 )

Review date: 21-04-2017

Department assigned to the subject: Bioengineering and Aerospace Engineering Department

Coordinating teacher: SOLER ARNEADO, MANUEL FERNANDO

Type: Compulsory ECTS Credits : 3.0

Year : 2 Semester : 1

## REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Air Navigation Systems  
Airports

## OBJECTIVES

## Skills

Acquire knowledge to create the foundations for future originality in the development and application of ideas, often in a research and innovation context.

Learn how to apply knowledge and the capacity to solve problems in new, multidisciplinary environments related with the area of study (in this case air transport)

Acquire capacity to integrate knowledge and face the complexity of judging given information that is incomplete and might include subjective reflexions on social responsibility and ethics.

Acquire capacity to communicate extracted conclusions, supporting them in a clear and unambiguous manner.

Acquire abilities to further continue studying the topics in a self and autonomous way.

Acquire capacity to technically manage research, development and innovation projects both in companies and centers of research in aerospace.

Acquire capacity to analyze and establish correction measures for environmental impact of the developed technical solutions.

Acquire capacity for the analysis and resolutions of aerospace problems in new environments.

Acquire knowledge and comprehension on the legislation that applies in the field of air transport.

Apply knowledge acquired on Air Navigation (including routes; communication, navigation, and surveillance systems; regulations) and airports to understand air transport.

Acquire knowledge about the exploitation of air transport (economical and social perspective)

Comprehension of the different international organization, markets and modes of transport

## LEARNING OUTCOMES

By successfully completing this course, the student should be able to:

- 1) Understand the social, economical and legal framework that applies to air transport.
- 2) Understand the roles of different actors, in particular airlines and manufacturers.
- 3) Understand airlines' operations, including aircraft operational performances
- 4) Understand how optimization algorithms can be applied to improve airlines' operations

## DESCRIPTION OF CONTENTS: PROGRAMME

Block I: Social, economical and legal framework

Defintion

Air transport Legislation (national and supranational organisms)

Air transport demand and markets

Certification Issues

Environmental impact

Maintenance

Aviation safety and security

Block II: Manufacturers and Airlines

Aircraft types and characteristics

The main aircraft manufacturers

Aircraft manufacturing cost

The Airlines

Airlines operational cost

Block III: Airline flight Operations

- Airline fleet planning
- Airline Schedule development
- Route planning
- Aircraft operational performances

Block IV: Optimization in air transport

- Airline schedule optimization: fleet assignment, schedule design, crew, maintenance.
- Flight plan optimization: optimal control and trajectory optimization

## LEARNING ACTIVITIES AND METHODOLOGY

### TEACHING ACTIVITES

Theoretical sessions

Practical sessions (exercises)

Labs in computer room

Individual work by the student

Group work

### TEACHING METHODOLOGY

Class exposition with the aid of computers and audiovisuals, and on the blackboard. Development of concepts and analysis of the bibliographic material

Critical lecture of different material: technical reports, papers, manuals.

Resolution of exercises posed by the Professor.

Elaboration of reports and oral communications by the student

## ASSESSMENT SYSTEM

Continuous Evaluation: 75%

- a) Labs (report)
- b) Individual and/or group Homework

Exam: 25%

Minimun final exam mark is 4 (out of 10) in order to go for the continuous evaluation.

<b>% end-of-term-examination:</b>	25
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	75

#### BASIC BIBLIOGRAPHY

- Peter Belobaba, Amadeo Odoni and Cynthia Barnhart The Global Airline Industry, Wiley, 2009

#### ADDITIONAL BIBLIOGRAPHY

- Dr George Williams, Dr J Frankie O'Connell Air Transport in the 21st Century: Key Strategic Developments, ashgate, 2011
- John G. Wensveen Air Transportation: A Management Perspective, Ashgate, 2015 (8th edition)
- Doganis Flying Off Course: The Economics of International Airlines, Routledge, 2013
- Dr Thomas Tacker, Mr Ken Fleming, Dr Bijan Vasigh Introduction to Air Transport Economics: From Theory to Applications, Ashgate, 2013
- Luis Utrilla Descubrir el transporte aéreo - 2ª Edición, AENA, 2003
- The Airline Business Rigas Doganis, Routledge, 2005