Airports

Academic Year: (2023 / 2024) **Review date: 11-07-2023**

Department assigned to the subject: Aerospace Engineering Department

Coordinating teacher: CEREZO MAGAÑA, MARIA

Type: Compulsory ECTS Credits : 6.0

Year : 1 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Students are expected to have a basic background on airports, i.e., history, definition, main elements, planning, airport operations.
This could have been easily achieved with any course during the Bachelor's Degree.

OBJECTIVES

The course aims to show a broad spectrum of the most important parameters to be taken into account in the design of airport facilities, from the terminal to the different runways and roadways. Continuous evaluation allows the development of the contents presented, being particularly important the design of the runway, the complementary taxiways and aprons, and finally the complete design of a terminal.

The design of airports involves future predictions of both demand and budgetary requirements to be taken into account. At the end of the course, students will have a broad knowledge of airport design and planning, which will prepare them for the challenge of initiating airport projects in their potential future careers.

Upon successful completion of the course the student should be able to:

1) Predict demand and determine the necessary capacity and congestion during operation of an airport.
2) Planning and Designing terminals and airport facilities complying with the certification requirements.
3) A better understanding of national and international regulations applicable to conduct Airport Certification in the planning , design and construction. To evaluate the influence of economic and institutional aspects in airport development .
4) Apply geodesy, cartography, topography and geotechnic to airport's operation and its infrastructure.
5) Understand the key features in the operation of air transport stakeholders; comparative analysis of the different modes of transport globally; aircraft types; cost structure of an airline; environmental impact of air transport.
6) Knowledge and understanding of national and international organizations that provide a leg

DESCRIPTION OF CONTENTS: PROGRAMME

1) Introduction to airports

2) Introduction to airport finance
a. Accounting basics (asset, liabilities, P&L, EBITDA)
b. Financing basics (leverage, cost of debt, cost of equity)
c. Project Valuation & Project Finance Basics

3) Business Plan of the Airport
a. Traffic forecasting
b. Aeronautical Revenues
c. Non aeronautical Revenues
d. Opex
e. EBITDA
f. Capex / Master Planning

4) Airports Engineering
a. Airside Design
   i. Runway
   ii. Taxiways
   iii. Aprons

iv. Control Tower
v. Other facilities

b. Landside Design
i. Terminal Building
ii. Other facilities

5) Airports Operations
a. Organization
b. Airfield operations (ground handling, etc.)
c. Landside operations (terminal operations, security, etc.)

6) Airports Environment
a. Regulatory environment (international standards, certification, etc.)
b. International Organizations
c. Competitive environment (main operators, market trends)
d. Airlines and how their strategy impact airports
e. Environmental impact of airports activity and development

LEARNING ACTIVITIES AND METHODOLOGY

LEARNING ACTIVITIES

AF1 - Lectures
AF2 - Practical sessions (cases study, exercises)
AF5 - Individual student work
AF7 - Group work and evaluation through presentation in class

TEACHING METHODOLOGIES

MD1 - Expositions in class with teacher support and audiovisual media, in which the main concepts of the subject are developed and the literature is provided to supplement student learning.

MD2 - Critical reading recommended by the subject teacher texts: Newspaper articles, reports, manuals, and / or scholarly articles, either for subsequent class discussion, either to expand and consolidate the knowledge of the subject.

MD3 - Solving practical cases, problems, etc.. posed by the teacher individually or in group

MD4 - Presentation and discussion in class, under teacher moderation issues related to the content of the material and case studies based on real projects.

MD5 - Preparation of papers and reports individually or in group

ASSESSMENT SYSTEM

Individual exercise 1	10%
Individual exercise 2	10%
Class Participation	5%
Group Project	15%
Final Exam	60%

Final Grade 100%
In order to pass the course, the student should achieve at least 50% and at least a 4.0/10 in the final exam.

Note that in the extraordinary call it is possible to pass the course either by completing the previous points or by obtaining a MINIMUM grade of 5.0 / 10 (valuing the final exam 100%)

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

BASIC BIBLIOGRAPHY

- de Gonzalo Velasco (Autor), Ismael Ordoñez (Autor), Miguel Rodriguez (Autor) Airport Business Planning: The definitive handbook for airport managers and investors, ORV, 2023
- Horonjeff, McKelvey, Sproule, Young Planning and Design of Airports (5th edition), McGraw-Hill, 2010

- Juan de Dios Ortúzar, Luis G. Willumsen Modelling Transport, Wiley, 2011
- Konstantinos Zografos Modelling and Managing Airport Performance , Wiley, 2013
- Norma Ashford Airport Operations (3rd edition), McGraw-Hill Professional, 2013
- Richard Neufville and others Airport Systems: Planning Design and Management, McGraw-Hill, 2013

ADDITIONAL BIBLIOGRAPHY

- Brealey / Myers / Allen Corporate Finance, McGraw-Hill .
- Francisco Salazar de la Cruz Introducción a la gestión económica de aeropuertos, Fundación AENA, 2003
- García Cruzado Ingeniería Aeroportuaria (2nd edition), ETSI Aeronáuticos, 2010
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- Richard de Neufville Airport Systems: Planning Design and Management, McGraw-Hill, 2013
- Rigas Doganis The Airport Business, Routledge, 1992
- Vicente Cudós Cuadernos de Ingeniería de Aeropuertos, EDITOR Vicente Cudós Samblancat, ISBN 8460796728, 9788460796725, 2004