



Guia docent

300087 - SMAO - Gestió Estratègica per Operacions Aèries

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Unitat responsable: Escola d'Enginyeria de Telecomunicació i Aeroespacial de Castelldefels
Unitat que imparteix: 748 - FIS - Departament de Física.

Titulació: MÀSTER UNIVERSITARI EN ENGINYERIA AERONÀUTICA (Pla 2014). (Assignatura optativa).

Curs: 2022 **Crèdits ECTS:** 5.0 **Idiomes:** Anglès

PROFESSORAT

Professorat responsable: Jovana Kuljanin

Altres:

CAPACITATS PRÈVIES

English (and professional/technical english). Mathematics and statistics. Knowledge related to business course (business models, microeconomics, macroeconomics, international agreements and organizations in civil aviation, air transport industry). Knowledge related to aircraft, airport and airspace acquired in other courses of Bachelor degree. Basic and required courses related to calculus and statistics. Business/company, aerospace technology, air transport infrastructure. Familiarity with knowledge of programming languages is preferable, especially Python and/or Matlab and C++.

REQUISITS

Concepts seen in 220309 - Transport Aeri i Sistemes de Navegació
(https://www.upc.edu/estudispdf/guia_docent.php?codi=220309&idioma=en)

METODOLOGIES DOCENTS

Specific competences:

CEEaeronav3: Estructurar organizativamente una aerolínea, incluyendo su modelo de negocio y la estructura de costes y beneficios, y modelar, analizar y diseñar las operaciones de una flota de aeronaves.

The course combines the following teaching methodologies:

- Theory classes.
- Autonomous learning: students will study using self-learning material.
- Cooperative learning: students will form small group (2-4 people) to fulfill some of the activities of the course.
- Project based learning: students will build a small team project (3-4 people).

Directed learning hours will consist in exercises and practical examples, after the theory classes in which the professor exposes the content of the subject. With the directed learning hours, the students will be motivated to participate actively in their education and to complete the knowledge acquired during theory classes, usually with the help of computers.

OBJECTIUS D'APRENTATGE DE L'ASSIGNATURA

The aim of this course is to provide students with the fundamentals of the strategic management of the airline operations. Some strategic management concepts and analytical tools to the airline industry will be proposed, as well as modeling and optimization techniques.

On successful completion of this course a student will be able to:

- . appraise key factors affecting demand for air travel,
- . evaluate forecasting methods and interpret the results with confidence,
- . understand the structure of airline revenue and cost,
- . understand the principles of airline network design,
- . describe the functions of flight operations, crewing and scheduling departments and the legal requirements,
- . develop a flight and crew schedule,
- . understand the impact of irregular operations and mechanisms to efficiently handle the disruption,
- . state how maintenance requirements are determined and how the legal requirements are met.

HORES TOTS DE DEDICACIÓ DE L'ESTUDIANTAT

Tipus	Hores	Percentatge
Hores grup petit	15,0	11.19
Hores grup gran	30,0	22.39
Hores grup mitjà	9,0	6.72
Hores aprenentatge autònom	80,0	59.70

Dedicació total: 134 h

CONTINGUTS

Introduction to demand and forecasting for airlines

Descripció:

- Introduction to air travel demand concept
- Introduction to air travel demand forecasting
- Market analysis, trend analysis, time series analysis
- Econometric modelling
- Evaluating forecasting results

Dedicació: 9h

Grup gran/Teoria: 4h

Grup petit/Laboratori: 2h

Aprenentatge autònom: 3h

Airline planning and operations

Descripció:

- Airline network design
- Fleet and schedule planning
- Aircraft routing and airline crew pairing and rostering

Dedicació: 31h

Grup gran/Teoria: 8h

Grup mitjà/Pràctiques: 3h

Aprenentatge autònom: 20h



Disruption management

Descripció:

- Irregular operations and disruption management
- Basic concepts on airline maintenance

Dedicació: 16h

Grup gran/Teoria: 6h

Grup petit/Laboratori: 2h

Aprentatge autònom: 8h

Project

Descripció:

Working in groups, the students will perform a literature review to select current challenges in airline planning and operations (i.e., crew pairing and rostering, fleet planning, etc.,) and will develop an algorithm to propose a solution to the identified problem. Focus will be made on identifying the problem, extracting realistic data, choosing the best method to solve it, validating the model and correctly extracting results, statistics and conclusions.

Dedicació: 69h

Grup gran/Teoria: 8h

Grup petit/Laboratori: 12h

Aprentatge autònom: 49h

SISTEMA DE QUALIFICACIÓ

Participation in class and exercises: 10%

Individual exams and tests: 35%

Projects and presentations: 55%

BIBLIOGRAFIA

Bàsica:

- Holloway, Stephen. Straight and level : practical airline economics [en línia]. Third edition. London: Routledge, 2016 [Consulta: 26/07/2022]. Disponible a : <https://www-taylorfrancis-com.recursos.biblioteca.upc.edu/books/mono/10.4324/9781315610894/straight-level-stephen-holloway>. ISBN 9786611798703.
- Shaw, Stephen. Airline marketing and management. 6th ed. Burlington: Ashgate, cop. 2007. ISBN 9780754648208.
- Clark, Paul. Buying the big jets : fleet planning for airlines. 2nd ed. Aldershot ; Burlington: Ashgate, cop. 2007. ISBN 9780754670919.
- Doganis, Rigas. Flying off course : airline economics and marketing. 4th ed. London ; New York: Routledge, cop. 2010. ISBN 9780415447379.
- Bruce, Peter J; Gao, Yi; King, John M. C. Airline operations : a practical guide. New York: Routledge, 2018. ISBN 9780367669850.