Degree	Type	Year	Semester
2501233 Aeronautical Management	OB	2	1

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

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Use of Languages

Principal working language: spanish (spa)

Some groups entirely in English: No

Some groups entirely in Catalan: No

Some groups entirely in Spanish: Yes

Teachers

Jordi Manzano Puigredon

Ernesto Emmanuel Santana Cruz

David Megías Jiménez

Prerequisites

None.

Objectives and Contextualisation

First part: Communications, Navigation and Surveillance systems

- Obtain an overview of the concepts related to the communication systems applied to the aeronautical sector.
- Understand the basic principles of communications, navigation and surveillance systems as well as know the main approach and landing systems and air traffic assistance.
- Identify areas for improvement and capture future technological trends of communications, navigation and surveillance in the aeronautical sector.

Second part: Introduction to computer networks

- Obtain an overview of the concepts related to computer networks, knowing how to place them in a hierarchical model of protocols.
- Understand the fundamental concepts of local and powerful local networks, focusing on the most used networks in the sector: Ethernet and ATM.
- Understand the fundamental concepts of network interconnection protocols that give rise to the network of networks (Internet).

Competences

- Apply specific software for solving problems in the aeronautical sector.
- Communication.
- Personal attitude.
- Personal work habits.
- Thinking skills.
- Use knowledge of the fundamental principles of mathematics, economics, information technologies and psychology of organisations and work to understand, develop and evaluate the management processes of the different systems in the aeronautical sector.
- Use new technologies in airline management.
- Work in teams.

Learning Outcomes

1. Accept and respect the role of the various team members and the different levels of dependence within the team.
2. Analyse computer network systems to meet the needs of airports and/or airlines.
3. Analyse requirements for suitable telecommunications systems.
4. Communicate knowledge and findings efficiently, both orally and in writing, both in professional situations and with a non-expert audience.
5. Critically assess the work done.
6. Describe the principles behind computer networks.
7. Describe the principles behind telecommunications systems applicable to the aeronautical sector.
8. Develop critical thought and reasoning.
9. Develop curiosity and creativity.
10. Develop independent learning strategies.
11. Develop systemic thinking.
12. Develop the ability to analyse, synthesise and plan ahead.
13. Generate innovative and competitive proposals in professional practice.
14. Identify, manage and resolve conflicts.
15. Maintain a proactive and dynamic attitude towards career progression, personal growth and continuous professional development. Have the will to succeed.
16. Make decisions.
17. Make efficient use of ICT in communicating ideas and results.
18. Manage information, critically appraising innovations in the field, and analyse future trends.
19. Manage time and available resources. Work in an organised manner.
20. Prevent and solve problems.
21. Use a simulator to model and analyse the behaviour of a local area network, long-range links and interconnected networks.
22. Work cooperatively.
23. Work independently.

Content

First part: Communications, Navigation and Surveillance systems

- Topic 1. Communications I. History. Technology. Aeronautical communications: HF, VHF and UHFTopic 5
- Topic 2. Communications II: Datalink systems (analogyc and digital)
- Topic 3. Navigation I. First navigation systems. Hiperbolic navigation. VDF. NDB/ADF. VOR/DME. ILS. MLS
- Topic 4. Navigation II: RNAV navigation. PBN. GNSS: Augmentation systems
- Topic 5. Surveillance I: Surveillance techniques. History. Radar operation. Primary ans secondary radars
- Topic 6. Surveillance II. Secondary radar mode S. ADS-B. European rules. TCAS. Multilateration. Fututes technologies

Second part: Introduction to computer networks

- Topic 1. Introduction to computer networks.
- Topic 2. Local area networks.
- Topic 3. Internet applications.

Methodology

Teaching will be offered on campus or in an on-campus and remote hybrid format depending on the number of students per group and the size of the rooms at 50% capacity.

The teaching methodology to follow is oriented to the learning of the subject by the student on a continuous basis. This process is based on the realization of three types of activities that will be developed throughout the course: theory classes, seminars, problems, practices and group work.

- Theoretical sessions: the teacher will provide information on the knowledge of the subject and on strategies to acquire, extend and organize this knowledge. The active participation of the students during these sessions will be encouraged, for example discussions in those points that support different technological solutions.
- Seminars: students must actively participate to consolidate the acquired knowledge by solving, presenting and debating problems that are related to them.
- Problems: approach and resolution of problems by the teachers interacting with the students and individual resolution of the same.
- Practices: there will be different sessions where the student will have to do a study and extract them in a final report. Preparation of group work in the subject: students will have to work in teams of three people in the research and elaboration of a work corresponding to the evidences of their learning of both theory and problems, while deepening in a technology Specific network at the teacher's proposal of the subject, which will allow students to acquire the knowledge and skills associated with the parts of theory and problems.

The proposed teaching methodology may undergo some modifications according to the restrictions imposed by the health authorities on on-campus courses.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Problems resolutions	20	0.8	2, 3, 5, 6, 7, 11, 10, 12, 9, 8, 13, 19, 18, 15, 16, 20, 23, 21
Theory classes first part	40	1.6	3, 7, 11, 12, 9, 8, 13, 18, 15
Theory classes second part	20	0.8	2, 6, 11, 12, 9, 8, 13, 18, 15, 21
Type: Supervised			
Practices	12	0.48	3, 1, 4, 7, 11, 12, 9, 8, 17, 13, 18, 14, 15, 22
Seminars	6	0.24	3, 7, 11, 12, 9, 8, 13, 18, 15
Type: Autonomous			

Study hours	83	3.32	2, 3, 5, 6, 7, 11, 10, 12, 9, 8, 13, 19, 18, 15, 16, 20, 23, 21
Works	40	1.6	2, 3, 1, 5, 4, 6, 7, 11, 10, 12, 9, 8, 17, 13, 19, 18, 14, 15, 16, 20, 22, 23, 21

Assessment

Ethical commitment

All the works developed throughout the course will be original, and therefore, they will not have been copied (partially or totally) from any other, neither of this course nor of past ones. Nor should any of your students (or partially) access to any of your works be distributed or copied so that they can be copied. Failure to comply with any of the foregoing points will imply automatically suspending the subject and apply the one that is defined in the regulations of the university or the center on this subject.

In terms of group work, the total or partial copy of one or more resources (books, web pages, work of other students, reports of final works of degrees or masters, doctoral theses, scientific articles or of press, etc.) The works must be written using the students' own words, so copying or translating paragraphs of different sources is also considered plagiarism. Every plagiarism will entail the automatic suspension of work and, consequently, the subject.

Without prejudice to other disciplinary measures that are deemed appropriate, and in accordance with the current academic regulations, the irregularities committed by the student that can lead to a variation of the qualification of an act of self- evaluation. Therefore, copying or letting copy a practice or any other evaluation activity will imply suspending it with a zero, and if it is necessary to pass it to pass it, the entire subject will be suspended. Qualified assessment activities will not be recovered in this way and by this procedure, and therefore the subject will be suspended directly without opportunity to recover it in the same academic year.

First part: Communications, Navigation and Surveillance systems

- 50% (25% of the final mark) will come from the validation tests of knowledge
- 50% (25%% of the final mark) will be obtained in laboratory practices and group activities. The practices are mandatory. The minimum mark required by this part to make half is 3.5 out of 10

Second part: Introduction to computer networks

- A 25% (12,5% of the final grade) will get the work done in group work. The minimum mark required by this part to make half is 3.5 on 10. The note will be the samefor all the members of the group.
- A 25% (12,5% of the final mark) of the qualification will come from the activities proposed in the theory sessions and seminars. Students who arrive at 75% of activities will obtain the evaluation of this part by means of the resolution of additional questions to the final test. The minimum mark required by this part to make half is 3.5 out of 10.
- The remaining 50% (25% of the final mark) will come from the proof of validation of knowledge that will be carried out at the end of the semester. The minimum mark required by this part to make half is 3.5 out of 10

At the end of the semester it will be offered to students who have not obtained the minimum qualification of any of the partial notes the possibility of recovering them. This recovery will be reserved for students who have worked on the subject during the semester. These students will be able to complete and / or correct specific aspects of group work and activities. They will also be able to re-conduct the proof of validation of knowledge and / orthe test of activities. There are aspects of the acquisition of competences that can not be evaluated in the second call, such as teamwork. These aspects will have to be overcome during the semester's work of the subject.

The dates of continuous assessment and work delivery will be published on the virtual campus (change if you use another platform) and may be subject to possible changes of programming for reasons of adaptation to

possible incidents. You will always be informed on the virtual campus (change if you use another platform) on these changes since it is understood that this is the usual platform for exchanging information between teachers and students

<u>Final note and recovery</u>

In order to obtain the final grade in the subject, it will be necessary to achieve at least 3.5 points out of 10 in each of the two parts. If the note of either of the two parts is less than 3.5 points out of 10, the student will suspend independently of the qualification of the other party. The final grade will be obtained with the following weighting:

Final qualification = 1/2 x qualification of the first part + 1/2 x qualification of the second part

To pass the subject, you must obtain at least 5 points out of 10 after applying this formula. Only the exams will be recoverable at the end of the course. The student can submit to the recovery whenever it has been presented to a set of activities that represent a minimum of two thirds of the total grade of the subject. Of these, those students who have the average of all the activities of the subject will be able to present to the recovery a qualification equal or superior to 3,5.

<u>Procedure for the review of qualifications</u>

For each assessment activity, a place, date and time of revision will be indicated in which the student will be able to review the activity with the teacher. Inthis context, claims can be made about the activity note, which will be evaluated by the teachers responsible for the subject. If the student does not submit to this review, this activity will not be reviewed later.

<u>Qualifications</u>

Honor enrollments Granting an honorific matriculation qualification is a decision of the faculty responsible for the subject. The UAB regulations indicate that MH can only be awarded to students who have obtained a final grade of 9.00 or more. It can be granted up to 5% of MH of the total number of students enrolled.

A student will be considered non-evaluable (NA) if it has not been presented in a set of activities whose weight equals to a minimum of two thirds of the total grade of the subject.

The proposed evaluation activities may undergo some changes according to the restrictions imposed by the health authorities on on-campus courses.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Activities and laboratory (1st part)	25%	0	0	3, 1, 5, 7, 11, 10, 12, 8, 17, 19, 18, 14, 15, 16, 20, 22, 23
Activities and problems (2nd part)	12,5%	0	0	2, 3, 5, 6, 7, 11, 10, 12, 9, 8, 17, 19, 14, 15, 16, 20, 23, 21
Exam 1st part	25,00%	2	0.08	4, 7, 11, 12, 8, 20
Exam 2nd part	25,00%	2	0.08	2, 3, 4, 6, 11, 12, 8, 23
Work 2nd part	12,5%	0	0	2, 3, 1, 5, 4, 6, 7, 11, 12, 9, 8, 17, 13, 19, 18, 14, 15, 20, 22, 21

Bibliography

Autònoma Interactiva - Campus Virtual: https://cv.uab.cat/

First part: Communications, Navigation and Surveillance systems

- GOLD document. ICAO.
- PBN manual. ICAO.
- Mandato ADS-B. Comisión europea
- Plan maestro ATM. SESAR.

Second part: Introduction to computer networks

- W. Stallings (2004). Comunicaciones y redes de computadoras, 7ª ed. Pearson Prentice-Hall.
- DE Comercio (2000). Internetworking with TCP / IP vuelo I, 4th ed. Prentice-Hall.
- Web de la primera parte de la asignatura:
  http://deic.uab.cat/docencia/viewprog.php?idioma=0&codias=25977-0&style=
- Signals and systems, Simon Haykin, Barry Van Veen. Ed. Wiley.
- Signals and systems, Alan V. Oppenheim, Alan S. Willsky S. Hamid. Ed. Prentice Hall.
- Sistemas de comunicaciones electrónicas, Wayne Tomasi, Pearson Education
- Sistemas de navegación, Ángel Corbasí. Ed. Mc. Graw Hill
- Radionavigation systems, Börje Forssell, Ed. Artech Housewares. Stallings (2004).

Links of interest

REVISTA AVIACIÓ: http://www.skybrary.aero

ACCIDENTS AÈRIS: http://www.planecrashinfo.com/database.htm

REVISTA SEGURETAT: http://wwwflightsafety.org

IATA: http://www.iata.org

AVIACIÓ CIVIL INTERNACIONAL: http://www.icao.int

DIRECCIÓ GENERAL D´AVIACIÓ CIVIL: http://www.mfom.es

AIS: http://ais.aena.es

EUROCONTROL: http://www.eurocontrol.int

EASA: http://www.easa.eu.int

FAA: http://www.faa.gov

EUR LEX: http://eur-lex.europa.eu

Software

Simulator 2000

CPDLC mockup

RITA (TCAS)