

Degree programme	Type	Course
Aeronautical Management	FB	1

Contact lecturer

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Prerequisites

None.

Group languages

You can consult this information at the [end](#) of the document.

Objectives

The fundamental objective of the subject is to present the general scope of engineering and the fundamental aspects of the engineering profession, as well as to work on the own method of solving problems in engineering. Additionally, this subject aims to provide an overview of the main professional opportunities of the Degree in Aeronautical Management studies. To this end, conferences given by professionals from the aeronautical sector will be scheduled.

Learning outcomes

- CM09 (Develop a small project while working in a team, aimed at designing solutions for real challenges in the management of aeronautical infrastructures and services.) Develop a small project while working in a team, aimed at designing solutions for real challenges in the management of aeronautical infrastructures and services.
- CM11 (Exercise roles in a work team, without sex/gender-based differentiation.) Exercise roles in a work team, without sex/gender-based differentiation.
- CM12 (Write up a development report for a small project that addresses improved workflow, the implementation of information systems and the optimisation of resources in the sector.) Write up a development report for a small project that addresses improved workflow, the implementation of information systems and the optimisation of resources in the sector.
- KM15 (Describe the general concepts that define engineering as a profession and their practical application in operational management.) Describe the general concepts that define engineering as a profession and their practical application in operational management.
- KM18 (Identify basic processes for carrying out a project, including knowledge of the tools and techniques necessary managing the work, focused on the optimisation of operational processes and management systems in the aviation sector.) Identify basic processes for carrying out a project, including knowledge of the tools and techniques necessary managing the work, focused on the optimisation of operational processes and management systems in the aviation sector.
- KM20 (Describe the role of the various members of a team, as well as the different levels of dependence, regardless of gender.) Describe the role of the various members of a team, as well as the different levels of dependence, regardless of gender.
- SM18 (Apply a systematic methodology for the resolution of problems related to the efficiency of operations, logistics and the organisation of air transport systems.) Apply a systematic methodology for

the resolution of problems related to the efficiency of operations, logistics and the organisation of air transport systems.

Contents

PART I: ENGINEERING AND SOCIETY

Topic 1: Introduction to Engineering

1. Introduction
2. Definitions of Engineering
3. A Brief History of Engineering
4. Engineering, Science, and Society
5. The Engineer as a Problem Solver

Topic 2: The Engineering Profession

1. Introduction
2. Branches of Engineering
3. Career Prospects for Engineers
4. Engineering Requirements
5. Ethics in Engineering

PART II: THE PROBLEM-SOLVING PROCESS IN ENGINEERING

Topic 3: Obstacles and Tools in Problem Solving

1. Introduction
2. Concept of a Problem
3. Cognitive Psychology and Thinking
4. Good Problem-Solving Habits
5. The Role of Knowledge in Problem Solving
6. Blocks and Creativity
7. Heuristics for Problem Solving

Topic 4: A Formal Framework for Problem Solving in Engineering

1. Introduction
2. Step 0: "I Can Do It"
3. Step 1: Definition
4. Step 2: 2: Exploration
5. Step 3: Planning
6. Step 4: Implementation
7. Step 5: Validation
8. Step 6: Conclusion

PART III: METHODS AND TOOLS IN ENGINEERING

Topic 5: Engineering Calculations

1. Number Systems
2. Dimensions
3. Units. The International System of Units (SI)
4. Significant Figures
5. Scientific Notation
6. Parameterization of Functions

Topic 6: Brief Introduction to Project Management

1. Introduction and General Concepts
2. Project Development Phases
3. Planning Tools

Topic 7: Model-Based Design

1. Introduction
2. Types of Models
3. Phases of the Modeling Process

Topic 8: Communication in Engineering

1. Sources of Information
2. Written Communication
3. Oral Communication

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Individual tutorials	3	0.12	KM15, KM18, KM20, SM18
Personal study	22	0.88	KM15, KM18, KM20
Sessions for introduction of tools	8	0.32	KM18, SM18
Theory sessions	12	0.48	KM15, KM18, KM20
Project development	44	1.76	CM09, CM11, CM12, KM20, SM18
Sessions of project presentations	2	0.08	CM09
Conferences	6	0.24	KM15, KM18, KM20
Project monitoring sessions	14	0.56	CM09, CM11, CM12, KM20, SM18
Problem sessions	10	0.4	KM15, KM18, KM20, SM18
Problem solving	26	1.04	KM15, KM18, SM18

The general methodological approach of the subject is based on the principle of multivariate strategies, which

aims to facilitate active participation and construction of the learning process by students. In this sense, full-group master classes will be proposed, and practical activities and monitoring of student work will be proposed in small groups.

Specifically, the training activities included in this subject are the following:

Theory classes

Exposition and discussion of the fundamental concepts of the subject (full group).

Problem classes

Resolution and discussion of exercises that allow the theoretical concepts of the subject to be reinforced (full group).

Tool introduction sessions

Basically, introductory sessions will be held on:

- Lego Mindstorms programming environment: This environment is needed for the development of the course project.
- Project planning computer tool, through which the course project will be planned.

These activities will be carried out mainly in small groups. The two computer applications that are needed will be provided from the subject.

Lectures

During the course (in class hours of the full group) some lectures will be scheduled on professional activities in the aeronautical sector (which you could opt for as Graduates of this degree) that will be taught by professionals in the sector.

Practical work (project)

The central work of the subject is the development in work teams of a small project for which, additionally, a report must be written and an oral presentation made. Through the development of this project, the aim is to put into practice the problem-solving method typical of engineering and thus work on the skills associated with the objectives of the subject.

For this activity, follow-up sessions will be held in small groups. Additionally, 3 sessions of 2 hours have been planned for the project presentations (one for each practical group).

Use of Artificial Intelligence Technologies

Restricted use: For this subject, the use of Artificial Intelligence (AI) technologies is permitted exclusively in support tasks, such as bibliographic or information searches, text correction or translations, or in the search for techniques that allow solving certain specific parts of an activity, provided that the student can understand what the AI technology provides and integrate it into their own process of resolving or developing the activity. In no

case is the use of AI technologies permitted to directly obtain the solution to a proposed activity. For this reason, when presenting their proposed solution to an assessable activity, the student must clearly identify which parts have been generated with this technology, specify the tools used and include a critical reflection on how these have influenced the process and the final result of the activity. The lack of transparency in the use of AI in this assessable activity will be considered a lack of academic honesty and may lead to a partial or total penalty in the grade of the activity, or greater sanctions in serious cases.

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.

Assessment

Continuous assessment activities

Title	Weight	Hours	ECTS	Learning outcomes
Continuous assesment	25%	0	0	KM15, KM18, SM18
Written exam	25%	3	0.12	KM15, KM18, SM18
Project	50%	0	0	CM09, CM11, CM12, KM18, KM20, SM18

This subject does not provide for the single assessment system.

$$\text{FINAL GRADE} = \text{CE1} \times 0.25 + \text{CE2} \times 0.25 + \text{CE3} \times 0.5$$

CE1: Continuous assessment grade.

CE2: Written exam grade.

CE3: Project grade.

If any of the assessment components (CEi) has a value lower than 4, the grade for the subject will be Failed.

The grade of Not Presented will only be obtained if no assessable element is submitted.

Details of the continuous assessment:

It will have two components:

- Formative assessment: It consists of a set of tests that students will take individually. They will basically be conceptual understanding questionnaires that will be taken based on a reading of the notes for each topic, prior to working on the topic in class. These tests will not be graded, they serve the teacher to plan the theory sessions and reinforce the explanation of those points that require it.
- Summative assessment: It consists of a set of tests that will be carried out individually, after the class work of each topic, in order to assess the level of achievement of the content of the same. These tests will be graded.

The continuous assessment (CA) grade will have two components:

- Number of tests (both formative and summative assessment) submitted (25% of the CA grade).
- Overall grade (arithmetic mean) of the summative assessment tests (75% of the CA grade).

Details of the project grade:

It will have two components:

- Overall assessment of the work (60% of the grade). This grade will be applied equally to each member of the team.
- Individual assessment of the work (40% of the grade)

Not presented and Honors Registration

- The grade of Not Presented will only be obtained if no assessable element is submitted.
- Honors. Awarding an honors grade is the decision of the teaching staff responsible for the subject. UAB regulations indicate that MHs may only be awarded to students who have obtained a final grade equal to or greater than 9.00. Up to 5% of MHs may be awarded to the total number of students enrolled in the subject.

Recovery of failed activities

In general (according to UAB academic regulations), the student may present for resit provided that he or she has presented for a set of activities that represent a minimum of two-thirds of the total grade for the subject.

In particular:

- If during the normal period of completion of the project the grade is suspended, the team will have the possibility of correcting the errors detected, during the subject resit period. In this case, the maximum final grade for the project that can be chosen will be 8. Under the UAB academic regulations, mentioned in the introductory paragraph of this section, since the project has a weight of 50% in the overall grade of the subject, a student who has not registered in any project team does not have the right to re-evaluate this element and, in application of the evaluation method, would have the subject failed.
- Regarding the written exam, there is a re-evaluation exam for students who have failed, or have not presented themselves to the exam of the regular call, as long as they comply with the UAB academic regulations, mentioned in the introductory paragraph of this section. The maximum grade that can be chosen for the re-examination exam will be 8.
- Continuous assessment activities do not have re-examination.

Repeating students

The evaluation method for repeating students will be the same as for the rest of the students.

Academic regulations on copying in assessment activities

Without prejudice to other disciplinary measures deemed appropriate, and in accordance with current academic regulations, irregularities committed by the student that may lead to a variation in the grade of an assessment act will be graded with a zero. Therefore, copying or allowing copying of a practice or any other assessment activity will imply failing it with a zero, and if it is necessary to pass it to pass, the entire subject will be suspended. Assessment activities graded in this way and by this procedure will not be recoverable and,

therefore, the subject will be directly suspended without the opportunity to recover it in the same academic year.

Bibliography

- Brockman, Jay B. *Introduction to engineering: modeling and problem solving*. John Wiley & Sons, Inc., 2009.
- Wright, Paul H. *Introducción a la ingeniería*. Tercera edición. Limusa Wiley, 2004.
- Gómez-Senent, Eliseo y otros. *Introducción a la ingeniería*. Editorial UPV, 2007.
- Grech, Pablo. *Introducción a la ingeniería: un enfoque a través del diseño*. Prentice Hall, 2001.
- Gómez, Alan G y otros. *Engineering your future: a project-based introduction to engineering*. Great Lakes Press, Inc., 2006.

Software

- Lego Mindstorms Programming Environment (to be provided)
- Microsoft Excel

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this [link](#). To access the information, you will need to enter the course CODE

Type of teaching	Group	Language	Semester	Shift
(TE) Theory	11	Catalan/Spanish	second semester	afternoon
(SEM) Seminars	21	Catalan/Spanish	second semester	afternoon
(SEM) Seminars	22	Catalan/Spanish	second semester	afternoon
(SEM) Seminars	23	Catalan/Spanish	second semester	afternoon