UAB
Universitat Autònoma de Barcelona

Artificial Intelligence

Code: 101764
ECTS Credits: 6

2025/2026

Degree	Type	Year
Aeronautical Management	OB	2

Contact

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Teaching groups languages

You can view this information at the end of this document.

Prerequisites

To be able to do the practical exercises of the course it is necessary to have the adequate knowledge of programming in Python language that is provided in Fundamentals of Computer Science and Advanced Computing.

Therefore, IN CASE OF NOT HAVING PASSED THE COURSE OF FUNDAMENTALS OF COMPUTERS PREVIOUSLY AND/OR NOT HAVING REGISTERED FOR ADVANCED COMPUTING IN THE CURRENT YEAR, IT IS STRONGLY RECOMMENDED NOT TO REGISTER FOR THIS COURSE THIS YEAR.

For the theoretical part of the course, some minimum knowledge of statistics (1st year) and algebra (2nd year) are also necessary.

In the case of students in the Business and Technology degree, it is recommended that they have passed the courses of their degree equivalent to those mentioned for the Aeronautical Management students.

Objectives and Contextualisation

The objectives of the subject can be summarized in:

- Describe the most important areas of artificial intelligence
- Describe the basic techniques of knowledge representation, learning and search for problem solving
- Recognize situations where the application of artificial intelligence may be adequate to solve a problem in the aeronautical sector
- Analyze the problem to solve and design the optimal solution applying the techniques learned
- Program the basic algorithms to solve the proposed problems
- Evaluate the results of the implemented solution and assess possible improvements
- Defend the decisions taken in the solution of the proposed problems

Competences

- Apply specific software for solving problems in the aeronautical sector.
- Communication.

- 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.
- 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. Apply imperative programming efficiently.
3. Apply suitable expert systems to help in making decisions and solving problems in the aeronautical sector.
4. Communicate knowledge and findings efficiently, both orally and in writing, both in professional situations and with a non-expert audience.
5. Develop independent learning strategies.
6. Develop scientific thinking skills.
7. Develop the ability to analyse, synthesise and plan ahead.
8. Make efficient use of ICT in communicating ideas and results.
9. Manage time and available resources. Work in an organised manner.
10. Understand the basic methods of representing information, learning and researching in order to solve problems.
11. Work cooperatively.
12. Work independently.

Content

1. Introduction
2. Problem solving and search
3. Knowledge representation
4. Machine learning
5. Neural networks
6. Multi-agent systems

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Laboratory classes	10	0.4	2, 3, 5, 11, 12
Problems classes	12	0.48	3, 10, 4, 6, 5, 11, 12
Theory and discussion classes	22	0.88	10, 4, 6, 7, 11
Type: Supervised			
Preparation and discussion of topics related to the practical tasks	15	0.6	3, 1, 10, 4, 5, 8, 9, 11, 12
Preparation of theory lectures	10	0.4	10, 5, 12

Type: Autonomous			
Group study	45	1.8	2, 3, 1, 5, 9, 11, 12
Personal study	30	1.2	5, 9, 12

The Campus Virtual platform (http://cv.uab.cat) will be the usual tool for exchanging information between teaching staff and students. All materials and information related to the development of the subject will be published on this platform.

The activities that will be carried out in the subject are organized as follows:

Theory classes

Two main methodologies will be followed:

- Participatory master class where the main concepts and algorithms of each subject will be presented, and examples and short exercises will be proposed so that students can put into practice specific aspects of the subjects presented.
- Inverted classroom where exercises and problems will be carried out that will have to be handed in at the end of the class. Before class, you will need to do some preparatory work such as watching a video, reading a document or answering a quiz.

Classes of problems

Exercises will be proposed to be solved in small cooperative groups in order to consolidate the learning of the topics presented in the theory classes. Depending on the topic, some of these exercises will be solved with programs. The work will be done in groups that will change for each delivery.

Practice classes

In practice classes, the most practical part of the tasks will be worked on. Solutions and feedback will be discussed in detail and attention will be given to each group through interviews and peer review. To check that each student in the group has understood each part of the solution given, there will be control sessions with compulsory attendance.

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

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Verification of group assignments	50%	2	0.08	2, 3, 1, 10, 4, 6, 7, 8, 9, 11
Written exam of Part 1	25%	2	0.08	2, 3, 10, 4, 6, 5, 9, 12
Written exam of Part 2	25%	2	0.08	2, 3, 10, 4, 6, 5, 9, 12

This course does not allow the unique evaluation system. The evaluation is continuous. The student sees his progress in the subject at all times.

There will be a delivery for each subject which may contain written exercises and programs. The tasks will be solved in groups and the groupings will be different for each task. In addition to the group grade that will be given by the teaching team, the students will be co-assessed and the individual grade will be given by the grade of the task multiplied by the normalized factor of the co-assessment and possibly an individual validation that can be a test or oral interview.

In total, the grades of the assignments contribute 50% of the final grade.

There will be two written exams during the course and each will have a weight of 25%.

There are no minimum grades in any of the assessments except the final grade. The grade to pass the subject is 5.0.

Recovery process: Both exams can be recovered. The student can present himself for recovery as long as he has presented himself 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 an average of all the activities of the subject with a grade higher than 3.5 may apply for recovery.

Criteria for Honors Matriculation: Awarding an honors matriculation qualification is the decision of the teaching staff responsible for the subject. UAB regulations indicate that MH can only be granted to students who have obtained a final grade equal to or higher than 9.00. Up to 5% of MH of the total number of enrolled students can be awarded.

Criteria for the Non-Evaluable grade: A student will be considered non-evaluable (NA) only if he/she has not appeared in the written test activities.

Scheduling of assessment activities: The dates of continuous assessment and assignmentof assignments will be published on the subject's website and on the Virtual Campus and may be subject to schedule changes for reasons of adaptation to possible incidents; information will always be provided on the subject's website and the Virtual Campus about these changes, as it is understood that the subject's website and the Virtual Campus are the usual mechanisms for exchanging information between professors and students.

Review procedure: For each assessment activity, a review place, date and time will be indicated in which the student can review the activity with the teacher. In this context, claims can be made about the grade of the activity, which will be evaluated by the teaching staff responsible for the subject. If the student does not appear for this review, this activity will not be reviewed later.

Use of AI tools (eg GPT chat): The use of such tools will be restricted to exams only. This means that it is imperative that you make critical use of these tools, that is, that you use them to learn, not to copy.

Note on plagiarism: Without prejudice to other disciplinary measures deemed appropriate, and in accordance with current academic regulations, irregularities committed by a student that may lead to a change in the grade in an evaluable activity will be graded with a zero (0). Assessment activities qualified in this way and by this procedure will not be recoverable. If it is necessary to pass any of these assessment activities to pass the

subject, this subject will be suspended directly, with no opportunity to recover it in the same course. These irregularities include, among others:

- the total or partial copy of a practice, report, or any other assessment activity;
- letting copy;
- presenting a group work not done entirely by the members of the group (applied to all members, not only those who have not worked);
- presenting as own materials prepared by a third party, even if they are translations or adaptations, and in general works with non-original and exclusive elements of the student;
- having communication devices (such as mobile phones, smart watches, pens with cameras, etc.) accessible during individual theoretical-practical assessment tests (exams);
- talking with colleagues during individual theoretical-practical assessment tests (exams);
- copying or attempting to copy from other students during theoretical-practical assessment tests (exams);
- using or trying to use writings related to the subject during the theoretical-practical assessment tests (exams), when these have not been explicitly allowed.

The numerical grade of the file will be the lower value between 3.0 and the weighted average of the grades in the event that the student has committed irregularities in an evaluation act (and therefore the approved by compensation will not be possible).
In short: copying, allowing copying or plagiarism in any of the assessment activities is equivalent to a SUSPENSION with a grade below 3.0.

Bibliography

S. Russell, P. Norvig. Artificial Intelligence: A Modern Approach. Ed. Prentice Hall, Fourth Edition, 2021.

Christopher M. Bishop. 2006. Pattern Recognition and Machine Learning (Information Science and Statistics). Springer-Verlag, Berlin, Heidelberg.

(Available at: Bishop-Pattern-Recognition-and-Machine-Learning-2006.pdfGitHubhttps://github.com › Benlau93 › blob › master › Bishop-...

I. Goodfellow, Y. Bengio, and A. Courville. Deep learning. MIT Press, 2016.

(Available at: https://www.deeplearningbook.org)

Software

We will use the latest version of Anaconda which includes Python 3.x and Spyder (https://www.anaconda.com/products/individual).

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this link. To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAUL) Classroom practices	11	Catalan	second semester	afternoon

(PAUL) Classroom practices	12	Catalan	second semester	afternoon
(PLAB) Practical laboratories	31	Catalan	second semester	afternoon
(PLAB) Practical laboratories	32	Catalan	second semester	afternoon
(PLAB) Practical laboratories	33	Catalan	second semester	afternoon
(PLAB) Practical laboratories	34	Catalan	second semester	afternoon
(TE) Theory	11	Catalan	second semester	afternoon