

Synthesis Project I

Code: 106593
ECTS Credits: 6

2025/2026

Degree	Type	Year
Artificial Intelligence	OB	2

Contact

Name: Ernest Valveny Llobet
Email: ernest.valveny@uab.cat

Teaching groups languages

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

Prerequisites

There are no official prerequisites but it is recommended to have completed the subjects of Fundamentals of Programming I and II, Data Engineering, Problem Solving, Ethics and Fundamentals of Machine Learning.

Objectives and Contextualisation

The objective of the subject is to develop a project in groups that requires applying the knowledge acquired in the rest of the subjects to the design and implementation of a solution to a real challenge of artificial intelligence application. For this, the different phases in the development of a project will be addressed, including the analysis of the challenge, the design of the solution, the selection of the methodology and the necessary tools, the implementation of the solution, the analysis of the results and the conclusions. We will introduce techniques for project management and teamwork organization, as well as communication skills to expose, argue and show the result of the project. The potential ethical implications of the proposed solution will also be considered.

Competences

- Act within the field of knowledge by evaluating the social, economic and environmental impact beforehand.
- Analyse and solve problems effectively, generating innovative and creative proposals to achieve objectives.
- Communicate effectively, both orally and in writing, adequately using the necessary communicative resources and adapting to the characteristics of the situation and the audience.
- Conceptualize and model alternatives of complex solutions to problems of application of artificial intelligence in different fields and create prototypes that demonstrate the validity of the proposed system.
- Identify, analyse and evaluate the ethical and social impact, the human and cultural context, and the legal implications of the development of artificial intelligence and data manipulation applications in different fields.
- Introduce changes to methods and processes in the field of knowledge in order to provide innovative responses to society's needs and demands.

- Students can apply the knowledge to their own work or vocation in a professional manner and have the powers generally demonstrated by preparing and defending arguments and solving problems within their area of study.
- Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
- Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
- Work cooperatively to achieve common objectives, assuming own responsibility and respecting the role of the different members of the team.
- Work independently, with responsibility and initiative, planning and managing time and available resources, and adapting to unforeseen situations.

Learning Outcomes

1. Analyse and solve problems effectively, generating innovative and creative proposals to achieve objectives.
2. Analyse the sustainability indicators of academic and professional activities in the field by incorporating the social, economic and environmental factors at play.
3. Communicate effectively, both orally and in writing, adequately using the necessary communicative resources and adapting to the characteristics of the situation and the audience.
4. Design a solution architecture that integrates the methods needed to address a complex AI problem.
5. Identify the most appropriate methods for solving a complex AI problem.
6. Identify the risks of developing an AI project from an ethical point of view.
7. Identify the social, economic and environmental implications of academic and professional activities for the field of knowledge.
8. Plan and follow up the stages needed to carry out an AI project.
9. Plan, conduct and analyse the experiments or tests necessary to evaluate an AI project.
10. Present the summary, results and conclusions of the progress of an AI project.
11. Propose evaluation methods for projects and actions to improve sustainability.
12. Propose viable projects and actions that enhance social, economic and environmental benefits.
13. Select the appropriate tools for implementing the solution to an AI problem.
14. Specify the needs and requirements of an AI project.
15. Students can apply the knowledge to their own work or vocation in a professional manner and have the powers generally demonstrated by preparing and defending arguments and solving problems within their area of study.
16. Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
17. Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
18. Weigh up the risks and opportunities of both your own and others' proposals for improvement.
19. Work cooperatively to achieve common objectives, assuming own responsibility and respecting the role of the different members of the team.
20. Work independently, with responsibility and initiative, planning and managing time and available resources, and adapting to unforeseen situations.

Content

- Project management
- Design thinking
- Ethical aspects of an AI project
- Communication skills
- Practical development of an AI project

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Follow-up sessions	10	0.4	2, 4, 14, 5, 6, 7, 9, 8, 18, 10, 11, 12, 13
Project development	111	4.44	1, 3, 17, 15, 16, 19, 20
Theory sessions	15	0.6	14, 5, 6, 8, 10, 13

The course will be organized around the development of a practical project based on a real challenge. Students will work in small groups of 4-6 members in the design and development of a solution to one of the proposed challenges. During the development of the project, we will introduce concepts of project management, ethical audit and communication skills.

Class activities will be organized in two types of sessions:

- Practical sessions: in these sessions the class group will be divided into two smaller groups. These sessions will be devoted to practical work on the development of the project: analysis of the problem, design of the solution, follow-up of the work, oral presentations, ...
- Theoretical sessions in which we will introduce some concepts that will be necessary to complete the project about project management, design thinking, ethical aspects and communication.

Students will have to extend the work done in the class sessions with their own work at home in order to be able to complete the project. The main body of the work necessary for the development of the project will have to be done in an autonomous way, apart from class hours.

All the information of the subject and the related documents that the students need will be available at the virtual campus (cv.uab.cat).

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.

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
Follow-up of the project	20%	2	0.08	2, 1, 4, 14, 5, 6, 7, 9, 8, 18, 11, 12, 15, 13, 19, 20
Oral presentations	15%	2	0.08	3, 10, 17
Project report	10%	10	0.4	10, 15, 16

The project grade is calculated weighting the evidences collected in each of the following activities:

- Follow-up sessions (20%): there will be some class sessions to monitor and assess the progress of the work done by the students.
- Written report (10%): students will have to write a final report describing their solution and presenting and discussing the main results.
- Oral presentation (15%): students will have to make a final oral presentation presenting the work done during the course.
- Technical quality of the implemented solution (50%): this evidence will correspond to the assessment of the design, implementation and testing of the proposed solution.
- Class attendance (5%)

In some of these evidences (follow-up sessions and oral presentation) there will be a group grade, but also an individual grade depending on the contribution of each student.

In order to obtain the final grade of the subject, the project grade calculated according to the previous criteria will be weighted by a grade of the individual contribution of each student to the project.

Final grade = Individual assessment * Project grade

The individual assessment of each student will be obtained through a process of intra-group evaluation where each member of the group will assess the contribution of the other members of the group.

As the development of the project is a continuous process throughout the semester, there is no recovery option in case the final grade does not reach the minimum of 5

In this subject, the use of generative Artificial Intelligence technologies is allowed in a controlled manner. The student must clearly identify which parts of his/her work have been carried out with the support of generative AI tools and, in any case, must be able to understand, explain and justify the work carried out. The lack of transparency in the use of generative AI will be considered a lack of academic honesty and may lead to a partial or total penalty in the grade of the activity.

Bibliography

No specific bibliography is recommended

Software

No specific software is required. It will depend on the project and techniques applied

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
(ABP) Aprendentatge basat en problemes	711	English	second semester	morning-mixed
(ABP) Aprendentatge basat en problemes	712	English	second semester	morning-mixed

