1. OVERVIEW

Subject area	INTRODUCTION TO ARTIFICIAL INTELLIGENCE
Degree	Bachelor's Degree in Data Science
School/Faculty	Faculty of Science, Engineering and Design
Year	2º
ECTS	4.5
Type	Compulsory
Language(s)	Spanish
Delivery Mode	On campus
Semester	4

2. INTRODUCTION

Artificial intelligence is one of the broadest and most relevant subject areas in computer science right now and for the future. It has become the most essential tool for information analysis as well as a host of other operations.
Data scientists must work with intelligent models on a daily basis and know how
to use them to get the best results. This subject will introduce students to the world of artificial intelligence. We will begin on a conceptual level and study the core components used to build different intelligent algorithms. We will also teach the data analysis process and look at some case studies on the use of intelligent models. We will complete the course by studying neural networks, which are one of the main tools for creating
intelligent systems.

3. SKILLS AND LEARNING OUTCOMES

Basic skills (CB, by the acronym in Spanish):

- CB1: Students have shown their knowledge and understanding of a study area originating from general secondary school education, and are usually at the level where, with the support of more advanced textbooks, they may also demonstrate awareness of the latest developments in their field of study.
- CB2: Students can apply their knowledge to their work or vocation in a professional manner and possess the skills which are usually evident through the forming and defending of opinions and resolving problems within their study area

Cross-curricular skills (CT, by the acronym in Spanish):

- CT01: Ethical values: ability to think and act in line with universal principles based on the value of a person, contributing to their development and involving commitment to certain social values.
- CT02: Independent learning: skills for choosing strategies to search, analyse, evaluate and manage information from different sources, as well as to independently learn and put into practice what has been learnt.

- CT03: Teamwork: ability to integrate and collaborate actively with other people, areas and/or organisations to reach common goals.
- CT05: Analysis and problem-solving: be able to critically assess information, break down complex situations, identify patterns and consider different alternatives, approaches and perspectives in order to find the best solutions and effective negotiations.

Specific skills (CE, by the acronym in Spanish):

- CE6. Capacity to apply the fundamental principles and basic techniques of intelligent systems.
- CE7. Ability to understand the life cycle of data, from data operation to data visualisation, including how to glean new information and how to use it.
- CE8. Ability to design technology and infrastructure suitable for the development and deployment of distributed systems.
- CE9. Ability to apply safety assessment criteria and methods and safety certification, as well as compliance with current legislation on personal data, privacy and the rights of the general public.

Learning outcomes (RA, by the acronym in Spanish):

- RA1: Understand the concept of artificial intelligence, its evolution, components and branches.
- RA2: Apply data analysis to a data science project.
- RA3: Model, train and apply simple cases of intelligent applications.
- RA4: Apply mathematical skills associated with machine learning and neural networks.
- RA5: Implement basic and intermediate neural networks using machine learning libraries.

The following table shows how the skills developed in the subject area match up with the intended learning outcomes:

Skills	Learning outcomes
CB1, CB2, CT01, CT02, CE6, CE8, CE9	RA1
CB1, CB2, CT01, CT05, CE7, CE9	RA2
CB1, CB2, CT03, CT05, CE6, CE8	RA3
CB1, CB2, CT02, CT05, CE6, CE8	RA4
CB1, CB2, CT03, CT05, CE6, CE8	RA5

4. CONTENTS

The subject matter is divided into four units:

Unit 1. Introduction to artificial intelligence
Unit 2. Data mining
Unit 3. Artificial intelligence tools for data analysis
Unit 4. Applications of artificial intelligence
Unit 5. Neural networks

5. TEACHING/LEARNING METHODS

The types of teaching/learning methods are as follows:

- Master lectures
- Collaborative learning
- Problem-based learning
- Project-based learning
- Learning based on laboratory work (laboratory, workshop and simulated environments)

6. LEARNING ACTIVITIES

The types of learning activities, plus the amount of time spent on each activity, are as follows:

On campus:

Learning activity	Number of hours
Master lectures	24.6
Problem-solving	16
Case studies and field studies	10
Laboratory work	15
Debates and discussions	4
Learning contract (definition of interests, needs and objectives)	1.6
Autonomous learning	45.4
Tutorials	7.6
On campus knowledge tests	1.6
TOTAL	**150**

7. ASSESSMENT

The assessment methods, plus their weighting in the final grade for the subject area, are as follows:

On campus:

Assessment system	Weighting
On campus tests to assess theory/practical learning	60
Off-site tests to assess theory/practical learning	20
Assessment of attitude	5
Self- and co-assessment	5
Laboratory, workshop or simulation tests	10

On the Virtual Campus, when you open the subject area, you can see all the details of your assessment activities and the deadlines and assessment procedures for each activity.

8. BIBLIOGRAPHY

- Dursun Delen, Predictive Analytics: Data Mining, Machine Learning and Data Science for Practitioners, 2nd Edition", Pearson FT Press.
- Robert Layton, "Learning Data Mining with Python Second Edition", Packt.
- Glenn J. Myatt , Wayne P. Johnson, Making Sense of Data I: A Practical Guide to Exploratory Data Analysis and Data Mining, 2nd Edition ", Wiley.
- David Carmona, "The AI Organization", O'Reilly.