1. OVERVIEW

Subject area	Intelligent Systems and Knowledge Representation
Degree	Bachelor's Degree in Computer Engineering
School/Faculty	Architecture, Engineering and Design
Year	Third
ECTS	6 ECTS
Type	Compulsory
Language(s)	Spanish
Delivery mode	On campus / Online
Semester	First semester
Year	2022/2023
Coordinating professor	Borja Monsalve Piqueras
Teacher	Borja Monsalve Piqueras

2. INTRODUCTION

Intelligent Systems in a subject area, worth 6 ECTS credits, belonging to the Computing subject of the Bachelor's Degree in Computer Engineering.

It is a subject area that complements the rest of the subjects within the degree programme, as it has multiple fields of application: robotics, home automation, artificial vision, video games, etc.

It covers topics related to business intelligence, the retrieval of text-based or, more specifically, web-based information, and intelligent agent systems, among others.

3. SKILLS AND LEARNING OUTCOMES

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

- **CB4:** Students can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences.

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

- **CE21:** Knowledge and application of the fundamental principles and basic techniques of intelligent systems and their practical application.

- **CE28:** Ability to learn about the fundamentals, paradigms and techniques of intelligent systems and to analyse, design and build systems, services and computer applications that use these techniques in any field of application.

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

RA1. Understand what an intelligent system is and know its main features.
RA2. Understand what Business Intelligence is and know the main phases of the process.
RA3. Understand what Intelligent Agents and multi-agent systems are.
RA4. Know the main techniques for retrieving text-based information.
RA5. Know the main techniques for retrieving web-based information.
RA6. Know what intelligent systems are and understand how they operate.

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

Skills	Learning outcomes
CB4, CE21, CE28	RA1 to RA6

4. CONTENTS

This subject is organised into the following content units:

- Introduction to Intelligent Systems
- Natural Language Processing (NLP)
- Information Retrieval (IR)
- Lexical analysis
- Web search
- Web Scraping
- Recommendation Systems
- Business intelligence
- Intelligent agents
- Multi-agent systems

5. TEACHING/LEARNING METHODS

The types of teaching/learning methods are as follows:

- Surveys on aims and interests.
- Lectures, subjects of study and seminars.
- Laboratory work.
- Group research and/or group problem-solving.
- Simulations for the development of conditional knowledge.
- Practical case studies.
- Fieldwork, conferences, visits to companies and institutions.

6. LEARNING ACTIVITIES

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

On campus:

Learning activity (AF, by the acronym in Spanish)	Number of hours
Lectures	50 h
Group work	25 h
Independent working	50 h
Tutorials, academic monitoring and assessment	25 h
TOTAL	**150 h**

Online:

Learning activity (AF, by the acronym in Spanish)	Number of hours
Independent working	50 h
Independent reading of topics and discussion	50 h
Group work	25 h
Tutorials, academic monitoring and assessment	25 h
TOTAL	**150 h**

7. ASSESSMENT

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

On campus:

Type	Assessment system	Weighting
1	Exams and tests.	30%
2	Development of articles, reports or design briefs.	30%
3	Portfolios, mind maps, peer assessment, etc.	20%
4	Fieldwork, conferences, visits to companies, discussion, etc.	5%
6	Case studies, designs, simulations and research (skill-based).	15%

Online:

Type	Assessment system	Weighting
8	Exams and tests.	60%
9	Development of articles, reports or design briefs.	10 - 20 %
10	Portfolios, mind maps, peer assessment, etc.	10 - 20 %
11	Fieldwork, conferences, visits to companies, discussion, etc.	0 - 5 %
12	Basic and general skills corresponding to the subject	10 - 20 %

On the Campus Virtual, when you open the subject area, you will find all the details of your assessable tasks and the deadlines and assessment procedures for each task.

7.1. Ordinary exam period

To pass the subject area in the ordinary exam period, you must achieve a final grade of at least 5 out of 10. In order for this to be possible, the following conditions must be met:

- In each oral or written knowledge test (exams, tests, demos, etc.), you must have a grade higher than or equal to the minimum grade indicated as a "pass" in each case (normally 5 out of 10).
- In each practical activity, you must have a grade higher than or equal to the minimum grade indicated
- as a "pass" in each case (normally 5 out of 10).
- On average, you must achieve a grade higher than or equal to the specified minimum (normally 5 out of 10) in the seminar, alternative and skill-based activities.

If any of the above points are not met, the maximum possible grade after applying the percentages will be 4 out of 10. The activities not passed in the ordinary exam period can be repeated in the extraordinary exam period, while maintaining the grades in those that were passed.

7.2. Extraordinary exam period (resits)

To pass the subject area in the extraordinary exam period, you must achieve a final grade of at least 5 out of 10.

You must repeat the activities that were failed or not submitted in the ordinary exam period, achieving a "pass" grade in each of them, with the same criteria as indicated for the previous exam period. For that purpose, alternative activities to those proposed in the ordinary exam period, or the corrections to errors in those activities, will be put forward.

If any of the above points are not met, the maximum grade in the ordinary exam period after applying the percentages will be 4 out of 10.

8. TIMELINE

The timeline with submission dates for the assessable tasks in this subject area will be indicated in this section:

Assessable tasks	Date
Exam 1	Weeks 9–10
Exam 2	Weeks 19–20
Practice	Weeks 10-19
Demo	Weeks 19–20
Exercises and classroom participation	Weeks 1-19
Talks, conferences, etc.	Weeks 1-19

The timeline may be subject to change for logistical reasons related to the activities. Students will be informed of any changes in due time and course.

9. BIBLIOGRAPHY

The recommended bibliography is indicated below:

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- D. Jannach, M. Zanker, A. Felferning, G. Fiedrich. "Recommender Systems: An Introduction". Cambridge Ed.
- Francesco Ricci · Lior Rokach · Bracha Shapira · Paul B. Kantor. "Recommender Systems Handbook". Spinger (nov 2015).
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  "Business Intelligence: Competir con Información". Josep Lluís Cano. [Julio de 2017]
  "Introducción al Business Intelligence". Josep Curto Díaz. Editorial UOC. 2012 [Septiembre 2017]

10. DIVERSITY AWARENESS UNIT

Students with special educational needs:

To ensure equal opportunities, curricular adaptations or adjustments for students with special educational needs will be outlined by the Diversity Awareness Unit (UAD, Spanish acronym).

As an essential requirement, students with special educational needs must obtain a report about the curricular adaptations/adjustments from the Diversity Awareness Unit by contacting unidad.diversidad@universidadeuropea.es at the beginning of each semester.

11. STUDENT SATISFACTION SURVEYS

Your opinion matters!

Universidad Europea encourages you to complete our satisfaction surveys to identify strengths and areas for improvement for staff, degrees and the learning process.

These surveys will be available in the survey area of your campus virtual or by email.

Your opinion is essential to improve the quality of the degree.
Many thanks for taking part.