

Academic Year/course: 2022/23

62220 - Intelligent Systems

Syllabus Information

Academic Year: 2022/23

Subject: 62220 - Intelligent Systems

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 534 - Master's Degree in Informatics Engineering

ECTS: 6.0

Year: 1

Semester: First semester

Subject Type: Compulsory

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

Classroom-based teaching and learning activities are based on:

1. **Lectures.** Presentation of content by presentation or explanation by a teacher (possibly including demonstrations).
2. **Expert talks.** Presentation of content through presentation or explanation by an expert external to the University
3. **Seminar.** Instructional period based on oral or written contributions from students.
4. **Problem-based learning.** Educational approach to learning and instruction in which students tackle real problems in small groups and under the supervision of a tutor.
5. **Laboratory session.** Activities carried out in special spaces with specialized equipment (laboratory, computer rooms).
6. **Tutorials.** Instructional period carried out by a tutor in order to review and discuss the materials and topics presented in the classes.
7. **Assessments.** Set of written, oral, practical tests, projects, works, etc. used in evaluating student progress

Other teaching and learning activities are based on:

1. **Practical work.** Preparation of activities to expose or deliver in practical classes.
2. **Theoretical study.** Study of contents related to the 'theoretical classes': includes any study activity that has not been computed in the previous section (studying exams, working in the library, complementary reading, doing problems and exercises, etc.)

4.2. Learning tasks

The course includes 6 ECTS (150 hours: 50 hours classroom activities/100 hours autonomous activities) distributed as

follows:

- Lectures, expert talks, seminars, problem-solving sessions, and laboratory sessions. (approximately 50 hours).
- Research assignments and projects (65 hours).
- Tutorials (5 hours).
- Autonomous work (25 hours).
- Assessment (5 hours). Evaluation tests.

4.3. Syllabus

The contents of the course will deepen the analysis, synthesis and evaluation of intelligent systems that incorporate some of these techniques:

- Knowledge representation
- Knowledge Engineering
- Probabilistic reasoning
- Planning and decision making
- Machine learning
- Multi Agent systems
- Other outstanding techniques

The course will address the following topics:

Topic 1. Models for Intelligent Systems

- 1.1 Graphical models
- 1.2 Hidden Markov Models
- 1.3 State-space Models
- 1.4 Application to scene recognition and tracking of objects using vision

Topic 2. Decision making: planning and learning

- 2.1 Markov Decision Processes (MDP)
- 2.2 Planning in MDPs
- 2.3 Reinforcement learning.
- 2.4 Application to robotics and videogames

Topic 3. Multi-Agent Systems

- 3.1 Theory of agents and multi - agent systems
- 3.2 Design Workshop SMA + JADE
- 3.3 Application exercises

4.4. Course planning and calendar

The educational organization of the sessions is planned as follows:

- Lectures
- Problem-solving and cases
- Laboratory sessions

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the Center website and the course website.

Projects will be submitted at the end of the semester.

The calendar of classes, practices and exams, as well as the delivery dates for assessment assignments, will be announced in advance, through <https://moodle2.unizar.es/add/>