UNIVERSIDAD DE CASTILLA - LA MANCHA
GUÍA DOCENTE

1. General information

Course: INTELLIGENT SYSTEMS

Type: CORE COURSE

Degree: 347 - DEGREE PROGRAMME IN COMPUTER SCIENCE ENGINEERING (CR)

Center: 108 - SCHOOL OF COMPUTER SCIENCE OF C. REAL

Year: 3

Main language: English

Use of additional languages:

Web site:

Code: 42321

ECTS credits: 6

Academic year: 2023-24

Group(s): 20 21 22

Duration: First semester

Second language: Spanish

English Friendly: N

Bilingual: Y

Lecturer: **LUIS JIMENEZ LINARES** - Group(s): **21**

Building/Office	Department	Phone number	Email	Office hours
Fermín Caballero / 3.16	TECNOLOGÍAS Y SISTEMAS DE INFORMACIÓN	+34926052487	luis.jimenez@uclm.es	Available on https://esi.uclm.es/index.php/grado-en-ingenieria-informatica/profesorado/

Lecturer: **JESÚS RAMÓN OVIEDO LAMA** - Group(s): **21 22**

Building/Office	Department	Phone number	Email	Office hours
	TECNOLOGÍAS Y SISTEMAS DE INFORMACIÓN		Jesus.Oviedo@uclm.es	

Lecturer: **LUIS RODRIGUEZ BENITEZ** - Group(s): **20 22**

Building/Office	Department	Phone number	Email	Office hours
Fermín Caballero / 2.05	TECNOLOGÍAS Y SISTEMAS DE INFORMACIÓN	+34926052490	luis.rodriguez@uclm.es	Available on https://esi.uclm.es/index.php/grado-en-ingenieria-informatica/profesorado/

2. Pre-Requisites

This course requires the ability to work with abstract concepts and a certain ability to solve problems autonomously.

A level of content in previous courses of the Degree is required:

- Basic knowledge in discrete mathematics and probability.
- Ability to pose and solve problems logically (first-order logic, inference, resolution, etc.).
- Mastery of typical data structures (graphs, trees, etc.) as well as the algorithms necessary for their management.
- Knowledge of basic algorithmic techniques, software engineering principles, algorithm cost analysis and algorithmic complexity.
- Programming fluency with high level object-oriented languages (e.g. Java).

Group work skills and basic knowledge (reading and comprehension) of English are also required.

3. Justification in the curriculum, relation to other subjects and to the profession

This course represents the gateway or presentation to the techniques of Artificial Intelligence within the Degree. These techniques are now included among those most required for solving complex problems: decision making; diagnostic, monitoring and control systems; web search engines; semantic web or web 2.0; recommendation systems; automatic learning; mining and data analysis; vision and robotics; etc.

There is no doubt that the subject requires other previous subjects (discrete mathematics, logic, all of the programming subject), is a requirement for subjects located later in the Degree (data mining, knowledge-based systems, multi-agent systems, artificial vision and robotics), and is a co-requirement to globally define a software project with other courses such as information systems, databases and software engineering.

4. Degree competences achieved in this course

Course competences

Code	Description
BA04	Basic knowledge about the uses and programming of computers, operating systems, data bases, and digital programmes with applications in engineering.
CO15	Knowledge and application of fundamental principles and basic techniques on intelligent systems and their practical applications.
INS01	Analysis, synthesis, and assessment skills.
INS03	Ability to manage information and data.
INS04	Problem solving skills by the application of engineering techniques.
INS05	Argumentative skills to logically justify and explain decisions and opinions.
PER01	Team work abilities.
SIS01	Critical thinking.
SIS03	Autonomous learning.
SIS04	Adaptation to new scenarios.
SIS05	Creativity.
SIS09	Care for quality.
UCLM02	Ability to use Information and Communication Technologies.

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Knowledge about the basic principles and techniques of intelligent systems and their practical application.

6. Units / Contents

Unit 1: Introduction to intelligent agents and intelligent systems

Unit 2: Problem solving through search.

Unit 3: Informed search and exploration.

Unit 4: Constraint satisfaction problems.

Unit 5: Search among adversaries.

Unit 6: Reinforcement Learning

ADDITIONAL COMMENTS, REMARKS

A laboratory practice:

Resolution of a problem by means of different strategies of search in a space of states.

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	BA04 CO15 SIS01 SIS09 UCLM02	0.72	18	N	-	Teaching of the subject matter by lecturer (MAG)
Individual tutoring sessions [ON-SITE]		BA04 CO15 UCLM02	0.18	4.5	N	-	Individual or small group tutoring in lecturer's office, classroom or laboratory (TUT)
Study and Exam Preparation [OFF-SITE]	Self-study	BA04 CO15 SIS01 SIS09 UCLM02	2.1	52.5	N	-	Self-study (EST)
Other off-site activity [OFF-SITE]	Practical or hands-on activities	BA04 CO15 INS03 INS04 INS05 PER01 SIS03 SIS04 SIS05 UCLM02	0.6	15	N	-	Lab practical preparation (PLAB)
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	BA04 CO15 INS01 INS04 PER01 SIS03 SIS09	0.6	15	Y	N	Worked example problems and cases resolution by the lecturer and the students (PRO)
Writing of reports or projects [OFF-SITE]	Self-study	BA04 CO15 INS01 INS04 INS05 PER01 SIS03	0.9	22.5	Y	N	Preparation of essays on topics proposed by lecturer (RES)
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	BA04 CO15 INS03 INS04 INS05 PER01 SIS03 SIS05 SIS09 UCLM02	0.6	15	Y	Y	Realization of practicals in laboratory /computing room (LAB)
Mid-term test [ON-SITE]	Assessment tests	BA04 CO15 INS01 INS04 INS05 UCLM02	0.15	3.75	Y	Y	Partial test 1 of the first half of the syllabus of the subject (EVA)
Mid-term test [ON-SITE]	Assessment tests	CO15	0.15	3.75	Y	Y	Partial test 2 of the second half of the syllabus of the subject (EVA)
Total:			**6**	**150**			
Total credits of in-class work: 2.4				**Total class time hours: 60**			
Total credits of out of class work: 3.6				**Total hours of out of class work: 90**			

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Theoretical papers assessment	15.00%	15.00%	Non-compulsory activity that can be retaken. To be carried out before end of teaching period
Mid-term tests	30.00%	0.00%	Partial Test 2. Compulsory activity that can be retaken. To be carried out within the planned dates of the final exam call. The Partial Test 1 retake will be performed at this date
Laboratory sessions	25.00%	25.00%	Compulsory activity that can be retaken. To be carried out during lab sessions or by self-study.
Mid-term tests	20.00%	0.00%	Partial Test 1. Compulsory activity that can be retaken (rescheduling). To be carried out at the end of the first half of the teaching period
Assessment of active participation	10.00%	10.00%	Non-compulsory activity that cannot be retaken. To be carried out in the theory/laboratory sessions for the students of the continuous modality. The students of non continuous modality will be evaluated of this activity through an alternative system in the ordinary call

Final test	0.00%	50.00%	Compulsory activity that can be retaken (rescheduling) to be carried out within the planned exam dates of the final exam call (convocatoria ordinaria).
Total:	**100.00%**	**100.00%**	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject , an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:

Continuous assessment:

In compulsory activities, a minimum mark of 40% is required in order to pass that activity and have the possibility to therefore pass the entire subject. A compulsory activity cannot be divided into eliminatory parts, nor can minimum marks be established for each of its parts. In the case of the activities that may be retaken (i.e., rescheduling), an alternative activity or test will be offered in the resit/retake exam call (convocatoria extraordinaria).

The partial tests will be common for all the theory/laboratory groups of the subject and will be evaluated by the lecturers of the subject in a serial way, i.e., each part of the partial tests will be evaluated by the same lecturer for all the students.

A student is considered to pass the subject if she/he obtains a minimum of 50 points out of 100, taking into account the points obtained in all the evaluable activities, and also has passed all the compulsory activities.

For students who do not pass the subject in the final exam call (convocatoria ordinaria), the marks of activities already passed will be conserved for the resit/retake exam call (convocatoria extraordinaria). If an activity is not recoverable, its assessment will be preserved for the resit/retake exam call (convocatoria extraordinaria) even if it has not been passed. In the case of the passed recoverable activities, the student will have the opportunity to receive an alternative evaluation of those activities in the resit/retake exam call and, in that case, the final grade of the activity will correspond to the latter grade obtained.

The mark of the passed activities in any call, except for the partial tests, will be conserved for the subsequent academic year at the request of the student, provided that mark is equal or greater than 50% and that the activities and evaluation criteria of the subject remain unchanged prior to the beginning of that academic year.

The failure of a student to attend the partial 1 and partial 2 tests will automatically result in her/him receiving a "Failure to attend" (no presentado). If the student has not passed any compulsory evaluation activity, the maximum final grade will be 40%.

Non-continuous evaluation:

Students may apply at the beginning of the semester for the non-continuous assessment mode. In the same way, the student may change to the non-continuous evaluation mode as long as she/he has not participated during the teaching period in evaluable activities that together account for at least 50% of the total mark of the subject. If a student has reached this 50% of the total obtainable mark or the teaching period is over, she/he will be considered in continuous assessment without the possibility of changing to non-continuous evaluation mode.

Students who take the non-continuous evaluation mode will be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences), through the assessment systems indicated in the column "Non-continuous evaluation".

In the "non-continuous evaluation" mode, it is not compulsory to keep the mark obtained by the student in the activities or tests (progress test or partial test) taken in the continuous assessment mode.

Specifications for the resit/retake exam:

Evaluation tests will be conducted for all recoverable activities. The failure of a student to attend the partial 1 and partial 2 tests will automatically result in her/him receiving a "Failure to attend" (no presentado), except in the case that the student conserves the mark for partial 1 and partial 2 from the final exam call (convocatoria ordinaria). In the latter case, the student's carrying out of any other evaluable activity in the resit/retake exam call (convocatoria extraordinaria) will result in a numerical mark.

Specifications for the second resit / retake exam:

Same characteristics as the resit/retake exam call.

9. Assignments, course calendar and important dates
Not related to the syllabus/contents
Hours   hours
General comments about the planning: The subject is taught in 3 x 1,5 hour sessions per week.

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Nilsson, Nils J.	Inteligencia artificial: una nueva síntesis	McGraw-Hill		9788448128241	2001	
Patrick Henry Winston	Inteligencia Artificial	Addison-wesley		0-201-51876-7	1994	
S.J. Russell y P. Norvig	Inteligencia artificial : un enfoque moderno	McGraw-Hill		842054003x	2004	