Teaching Guide				
Identifying Data				2023/24
Subject (*)	AI Fundamentals		Code	614544001
Study programme	Máster Universitario en Intelixencia Artificial			
Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	1st four-month period	First	Obligatory	3
Language	English			
Teaching method	Face-to-face			
Prerequisites				
Department	Ciencias da Computación e Tecnoloxías da Información			
Coordinador	Alvarez Estevez, Diego	E-mail	diego.alvareze@udc.es	
Lecturers	Alvarez Estevez, Diego Munteanu , Cristian Robert	E-mail	diego.alvareze@udc.es c.munteanu@udc.es	
Web	www.usc.gal/es/estudios/masteres/ingenieria-arquitectura/master-universitario-intelixencia-artificial/20232024/fundament			
General description	The subject introduces the student to the basic aspects that define AI, fundamentally the automatic resolution of problems that cannot be approached or that are difficult to approach through conventional programming techniques. In this context, state space search algorithms for problem solving will be addressed, as well as knowledge representation and reasoning. Teaching guide coordinating center (USC): https://www.usc.gal/es/estudios/masteres/ingenieria-arquitectura/master-universitario-intelixencia-artificial/20232024/fundamentos-ia-18827-17978-2-102307			

Study programme competences / results	
Code	Study programme competences / results
A5	CE04 - Knowing the fundamentals and basic techniques of Artificial Intelligence, plus their practical application
A17	CE16 - Knowledge of the process and tools for processing and preparing data, from their acquisition, extraction, and cleansing to their transformation, loading, organisation and access
B1	CG01 - Maintaining and extending theoretical foundations to allow the introduction and exploitation of new and advanced technologies in the field of AI
B2	CG02 - Successfully addressing each and every stage of an AI project
B3	CG03 - Searching and selecting that useful information required to solve complex problems, with a confident handling of bibliographical sources in the field
B4	CG04 - Suitably elaborating written essays or motivated arguments, including some point of originality, writing plans, work projects, scientific papers and formulating reasonable hypotheses in the field
B5	CG05 - Working in teams, especially of multidisciplinary nature, and being skilled in the management of time, people and decision making
B6	CB01 - Acquiring and understanding knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, frequently in a research context
B7	CB02 - The students will be able to apply the acquired knowledge and to use their capacity of solving problems in new or poorly explored environments inside wider (or multidisciplinary) contexts related to their field of study
B8	CB03 - The students will be able to integrate different pieces of knowledge, to face the complexity of formulating opinions (from information that may be incomplete or limited) and to include considerations about social and ethical responsibilities linked to the application of their knowledge and opinions
C2	CT02 - Command in understanding and expression, both in oral and written forms, of a foreign language
C3	CT03 - Use of the basic tools of Information and Communications Technology (ICT) required for the student's professional practice and learning along her life
C4	CT04 - Acquiring a personal development for practicing a citizenship under observation of the democratic culture, the human rights and the gender perspective
C6	CT06 - Acquiring abilities for life and healthy customs, routines and life styles

C7	CT07 - Developing the ability to work in interdisciplinary or cross-disciplinary teams to provide proposal that contribute to a sustainable environmental, economic, political and social development
C8	CT08 - Appreciating the importance of research, innovation and technological development in the socioeconomic and cultural progress of society
C9	CT09 - Being able to manage time and resources: outlining plans, prioritising activities, identifying criticisms, fixing deadlines and sticking to them

Learning outcomes			
Learning outcomes	Study programme competences / results		
Know the fundamental principles and basic techniques of artificial intelligence	AC4 AC16	BC1 BC2 BC3 BC4 BC5 BC6 BC7 BC8	CC2 CC3 CC4 CC6 CC7 CC8 CC9
Distinguish when it is more appropriate to apply artificial intelligence techniques to solve a problem	AC4 AC16	BC1 BC2 BC3 BC4 BC5 BC6 BC7 BC8	CC2 CC3 CC4 CC6 CC7 CC8 CC9
Know how to use and apply basic tools and techniques of artificial intelligence	AC4 AC16	BC1 BC2 BC3 BC4 BC5 BC6 BC7 BC8	CC2 CC3 CC4 CC6 CC7 CC8 CC9
Acquire the basic operating principles of the main automatic reasoning techniques and planning methods	AC4 AC16	BC1 BC2 BC3 BC4 BC5 BC6 BC7 BC8	CC2 CC3 CC4 CC6 CC7 CC8 CC9

Know and understand that the resolution of certain problems in Artificial Intelligence implies defining a representation of the problem and a search process for the solution	AC4 AC16	BC1 BC2 BC3 BC4 BC5 BC6 BC7 BC8	CC2 CC3 CC4 CC6 CC7 CC8 CC9
Identify if a given problem is likely to be solved by search techniques and decide, based on well-founded criteria, the most appropriate technique to solve it	AC4 AC16	BC1 BC2 BC3 BC4 BC5 BC6 BC7 BC8	CC2 CC3 CC4 CC6 CC7 CC8 CC9

Contents	
Topic	**Sub-topic**
Introduction. Troubleshooting in AI. Structured representations of knowledge. Knowledge representation methods. Basic models of reasoning	Introduction. Troubleshooting in AI. Structured representations of knowledge. Knowledge representation methods. Basic models of reasoning

Planning				
Methodologies / tests	**Competencies / Results**	**Teaching hours (in-person & virtual)**	**Student?s personal work hours**	**Total hours**
Laboratory practice	A5 A17 B1 B2 B3 B4 B5 B6 B7 B8 C2 C3 C4 C6 C7 C8 C9	7	21	28
Problem solving	A5 A17 B1 B2 B3 B4 B5 B6 B7 B8 C2 C3 C4 C6 C7 C8 C9	4	23	27
Guest lecture / keynote speech	A5 A17 B1 B2 B3 B4 B5 B6 B7 B8 C2 C3 C4 C6 C7 C8 C9	10	9	19
Personalized attention		1	0	1
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	**Description**
Laboratory practice	Laboratory practices: the teaching staff of the subject poses to the students a problem or problems of a practical nature whose resolution requires the understanding and application of the theoretical-practical contents included in the contents of the subject. Students can work on the solution to the problems raised individually or in groups. This teaching methodology will be applied to the training activity "Practical laboratory classes" and may be applied to the training activity of "Problem-based learning sessions, seminars, case studies and projects"
Problem solving	Learning by projects: students are presented with practical projects whose scope requires that an important part of the total dedication of the student be devoted to the subject. In addition, due to the scope of the work to be carried out, it is required not only that the students apply management skills as well as technical skills.

Guest lecture / keynote speech	Expository method / master class: the teacher presents a topic to the students with the aim of providing a set of information with a specific scope. This teaching methodology will be applied to the training activity "Theory classes"

Personalized attention	
Methodologies	**Description**
Laboratory practice	A atención personalizada ao estudantado comprende non só as titorías, presenciais ou virtuais, para a discusión de dúbidas, senón tamén as seguintes actuacións: - Seguemento do labor realizado nas prácticas de laboratorio propostas polo profesorado. - Avaliación dos resultados obtidos nas prácticas. - Encontros personalizados para resolver dúbidas sobre os contidos da asignatura.

Assessment			
Methodologies	**Competencies / Results**	**Description**	**Qualification**
Guest lecture / keynote speech	A5 A17 B1 B2 B3 B4 B5 B6 B7 B8 C2 C3 C4 C6 C7 C8 C9	Exame escrita para evaluar os coñecementos da Materia	50
Laboratory practice	A5 A17 B1 B2 B3 B4 B5 B6 B7 B8 C2 C3 C4 C6 C7 C8 C9	Evaluación de traballos prácticos	50

Assessment comments
The learning assessment considers both the theoretical and the practical part. In order to pass the subject an overall mark equal to or higher than 5 must be obtained, out of a maximum of 10 points in the assessment activities, whose weight in the final assessment will be within the ranges included in the degree report: E1: Final exam 50% E2: Evaluation of practical work 50%. Students who have not taken the exam and have not submitted to the evaluation of any other compulsory activity will obtain the grade of not presented. In order to pass the course in the second opportunity, students must submit to the evaluation of all those parts or pending compulsory deliveries that are established. For the rest, the grades obtained during the course will be retained The fraudulent performance of tests or assessment activities, once verified, will directly involve disqualification in the call in which it is committed: the student will be qualified with numerical grade 0 in the corresponding call of the academic year, both if fraud is committed in the first opportunity as in the second. For this, qualification will be modified in the first opportunity report, if necessary

Sources of information	
Basic	
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Other comments

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.