Teaching Guide				
Identifying Data				2023/24
Subject (*)	Augmented Reality Process Simulation		Code	770G01052
Study programme	Grao en Enxeñaría Electrónica Industrial e Automática			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	2nd four-month period	Third	Optional	6
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Enxeñaría Industrial			
Coordinador	Rivas Rodriguez, Juan Manuel	E-mail	m.rivas@udc.es	
Lecturers	Rivas Rodriguez, Juan Manuel	E-mail	m.rivas@udc.es	
Web				
General description	Simulation by software of industrial processes.			

Study programme competences	
Code	Study programme competences
A4	Capacidade de xestión da información, manexo e aplicación das especificacións técnicas e da lexislación necesarias no exercicio da profesión.
A5	Capacidade para analizar e valorar o impacto social e medioambiental das solucións técnicas actuando con ética, responsabilidade profesional e compromiso social, e buscando sempre a calidade e mellora continua.
A10	Coñecementos básicos sobre o uso e programación dos ordenadores, sistemas operativos, bases de datos e programas informáticos con aplicación en enxeñaría.
A30	Coñecer e ser capaz de modelar e simular sistemas.
B1	Capacidade de resolver problemas con iniciativa, toma de decisións, creatividade e razoamento crítico.
B2	Capacidade de comunicar e transmitir coñecementos, habilidades e destrezas no campo da enxeñaría industrial.
B4	Capacidade de traballar e aprender de forma autónoma e con iniciativa.
B5	Capacidade para empregar as técnicas, habilidades e ferramentas da enxeñaría necesarias para a práctica desta.
B6	Capacidade de usar adecuadamente os recursos de información e aplicar as tecnoloxías da información e as comunicacións na enxeñaría.
B8	CB1 - Que los estudiantes hayan demostrado poseer y comprender conocimientos en un área de estudio que parte de la base de la educación secundaria general, y se suele encontrar a un nivel que, si bien se apoya en libros de texto avanzados, incluye también algunos aspectos que implican conocimientos procedentes de la vanguardia de su campo de estudio.
B9	CB2 - Que los estudiantes sepan aplicar sus conocimientos a su trabajo o vocación de una forma profesional y posean las competencias que suelen demostrarse por medio de la elaboración y defensa de argumentos y la resolución de problemas dentro de su área de estudio.
B10	CB3 - Que los estudiantes tengan la capacidad de reunir e interpretar datos relevantes (normalmente dentro de su área de estudio) para emitir juicios que incluyan una reflexión sobre temas relevantes de índole social, científica o ética.
B11	CB4 - Que los estudiantes puedan transmitir información, ideas, problemas y soluciones a un público tanto especializado como no especializado.
B12	CB5 - Que los estudiantes hayan desarrollado aquellas habilidades de aprendizaje necesarias para emprender estudios posteriores con un alto grado de autonomía.
C1	Expresarse correctamente, tanto de forma oral coma escrita, nas linguas oficiais da comunidade autónoma.
C2	Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida.
C3	Desenvolverse para o exercicio dunha cidadanía aberta, culta, crítica, comprometida, democrática e solidaria, capaz de analizar a realidade, diagnosticar problemas, formular e implantar solucións baseadas no coñecemento e orientadas ao ben común.
C5	Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.
C6	Asumir como profesional e cidadán a importancia da aprendizaxe ao longo da vida.

Learning outcomes			
Learning outcomes	Study programme competences		
Know the basics of 3D simulation, as well as the current techniques of virtual reality and augmented reality and the necessary devices in its industrial implementation.	A4 A5 A10 A30	B1 B2 B4 B5 B6 B8 B9 B10 B11 B12	C1 C2 C3 C5 C6

Contents	
Topic	Sub-topic
Simulation in manufacturing 4.0	Introduction.
General aspects of Virtual Reality and Augmented Reality (elements, types, levels)	- Fields of application. - Study of cases.
Architecture (Devices and peripherals)	- Input devices and sensors. - Proccesing units. - Displays.
Programs and applications	- Configuration of devices, servers and networks. - Apps programming.

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Laboratory practice	A4 A5 A10 A30 B1 B2 B4 B6 B8 B9 B10 B11 B12 C1 C2 C3 C5 C6	20	0	20
Supervised projects	A4 A5 A30 B1 B2 B4 B5 B6 B8 B9 B10 B11 B12 C1 C2 C3 C5 C6	0	108	108
Guest lecture / keynote speech	B1 B2 B8 B10 B11 B12 C5	17	0	17
Personalized attention		5	0	5
(*)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	Exercises in the laboratory for the knowledge of the computer tools so that the student can carry out the supervised works autonomously.
Supervised projects	In them the student will demonstrate his ability to solve problems and mastery of the tools and techniques learned through the lecture session and practices. The qualification will be made mostly based on these works.
Guest lecture / keynote speech	Class directed by the teacher where students can participate and be asked.

Personalized attention

Methodologies	Description
Laboratory practice Supervised projects	It will be carried out in the laboratory practices and through the tutorials in the supervised projects.

Assessment			
Methodologies	Competencies	Description	Qualification
Laboratory practice	A4 A5 A10 A30 B1 B2 B4 B6 B8 B9 B10 B11 B12 C1 C2 C3 C5 C6	The laboratory practices are compulsory attendance and 40% of the maximum grade must be obtained to be able to pass the subject.	50
Supervised projects	A4 A5 A30 B1 B2 B4 B5 B6 B8 B9 B10 B11 B12 C1 C2 C3 C5 C6	The works will be done individually. They will be the basis for the qualification of the subject.	50

Assessment comments
In laboratory practices and supervised work, it will be necessary to obtain 40% of the maximum grade in order to pass the subject. Students who take part in the non-compulsory attendance and/or partial enrollment may agree with the teacher the possibility of doing alternative activities to the face-to-face ones. The criteria for passing the subject on the second opportunity are the same as for passing on the first.

Sources of information	
Basic	- Schneider Electric (2020). EcoStruxure Augmented Operator Advisor Builder. Schneider Electric - Schneider Electric (2020). EcoStruxure Augmented Operator Advisor App. Schneider Electric - Schneider Electric (2020). EcoStruxure Augmented Operator Advisor Administrator. Schneider Electric - MathWorks (2021). Introducción a Simulink. https://es.mathworks.com/learn/tutorials/simulink-onramp.html
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Computer Science/770G01002
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.