UNIVERSIDADE DA CORUÑA

Teaching Guide				
Identifying Data				2023/24
Subject (*)	Integration with Other Technologies		Code	731550005
Study programme	Máster Universitario en Fabricación Aditiva			
Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	1st four-month period	First	Obligatory	3
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Enxeñaría Industrial			
Coordinador	Casteleiro Roca, José Luis	E-mail	jose.luis.casteleiro@udc.es	
Lecturers	Casteleiro Roca, José Luis	E-mail	jose.luis.casteleiro@udc.es	
Web				
General description	The main objective of this course is for students to learn how to integrate different technologies into manufacturing processes. Special attention will be paid to the integration of manufacturing systems in companies' production, quality and environmental control systems. It is intended that students understand how to introduce various variables into additive manufacturing systems, whether they are necessary in the manufacturing process itself (for example, distance measurements) or independent variables (for example, weather variables).			

Study programme competences / results	
Code	Study programme competences / results
C4	RA25.Combine and integrate different technologies in additive manufacturing processes.
C8	RA29. Integrate the additive manufacturing system into the company's production control management system, taking into account quality, safety and environmental requirements.

Learning outcomes			
Learning outcomes	Study programme competences / results		
Combine and integrate different technologies in additive manufacturing processes.			CJ4
Integrate the additive manufacturing system into the company's production control management system, meeting quality, safety and environmental requirements.			CJ8

Contents	
Topic	Sub-topic
Description of the new emerging technologies and their application in AM.	Description of sensors/gatherers and actuators along with their typical signal conditioning circuits.
Basic aspects and notions about the integration of technologies.	System integration applications; data acquisition and distribution.
Process hardware and software. Interoperability (ability to share information).	Explanation of the different types of 3D printers, the basic topologies and their construction.

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Guest lecture / keynote speech	C4 C8	16	15	31
Laboratory practice	C4	8	8	16
Supervised projects	C8	0	15	15
Objective test	C4 C8	2	10	12

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**
Guest lecture / keynote speech	Keynote speech complemented with the use of audiovisual media and the introduction of some questions to students, in order to transmit knowledge and facilitate learning. The order of the topics covered will not have to be the one described in the teaching guide. In addition, there will be topics that can be seen together on the development of others, and the division between them may not be strict.
Laboratory practice	Performing laboratory practice as far as possible; or, failing that, solving exercises and specific problems in the classroom, from the knowledge explained.
Supervised projects	Performing a bulletin individual character problems, similar to those solved in the classroom exercises. In addition, within the supervised projects can include a small work of specific subjects of the assignment to ensure the correct understanding of the subject.
Objective test	It consists in carrying out an test of approximately 2 hours, in which the acquired knowledge will be evaluated.

Personalized attention	
Methodologies	**Description**
Supervised projects	The student has the relevant meetings of personalized tutorials, to resolve the concerns arising from the matter.

Assessment			
Methodologies	**Competencies / Results**	**Description**	**Qualification**
Supervised projects	C8	Accomplishment of an individual and group work, as well as its exhibition in class	40
Objective test	C4 C8	Exam type objective test	30
Laboratory practice	C4	Some tasks established in the subject, within the framework of this methodology	30

Assessment comments

As part of the "Laboratory practice" may include aspects such as attendance, personal work, attitude, etc., to help to pass the subject. Students with recognition of part-time dedication and academic waiver of attendance exemption, second establishes the "NORMA QUE REGULA O RÉXIME DE DEDICACIÓN AO ESTUDO DOS ESTUDANTES DE GRAO NA UDC (Arts. 2.3; 3.b e 4.5) (29/5/212)", will be evaluated in the same way, allowing one more week of margin in the assignments. For the second opportunity, there will be no second deadline for assignments, and the evaluation will be done in a similar way to the first opportunity. The evaluation criteria of the early December call will be the same as those of the second opportunity of the previous year. The fraudulent completion of tests or assessment activities, once verified, will directly imply that the student will be qualified with "suspension" (numerical grade 0) in the corresponding call for the academic year, whether the offense is committed at the first opportunity as in the second For this, your qualification will be modified in the first opportunity report, if necessary. In case the student commits an infraction in the subject (according to the Student Disciplinary Regulations): the student will be graded with a "fail" (numerical grade 0) in the corresponding exam session, whether the infraction is committed at the first or second opportunity. For this, the student's grade will be modified in the first opportunity report, if necessary.

Sources of information	
Basic	- Tom Wanyama (2016). A Practical Approach To Industrial Systems Integration. McMaster University, Hamilton - Perry Lea (2018). Internet of Things for Architects. Packet - Miguel A. Pérez García (2014). Instrumentación Electrónica. Thomson
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

Recommendations on sustainability and the environmentStudents will be taught the importance of ethical principles related to the values of sustainability so that they can apply them not only in the classroom, but also in their personal and professional behaviour.To help achieve an immediate sustainable environment and meet the objective of action number 5: "Healthy, environmentally and socially sustainable teaching and research" of the "Green Campus Ferrol Action Plan":The delivery of the documentary work carried out in this subject:- It will be requested in digital format and/or in computer support.- It will be done through Moodle, in digital format without the need to print it.- If it is necessary to do them on paper: o No plastics will be used. o Double-sided printing will be used. o Recycled paper should be used. o Drafts should not be printed.Sustainable use of resources and prevention of negative impacts on the natural environment should be made.Recommendations on Gender Equality and respect for diversity- According to the different regulations applicable to university teaching, the gender perspective must be incorporated in this subject (non-sexist language will be used, bibliography of authors of both sexes will be used, the intervention of male and female students in class will be encouraged...).- We will work to identify and modify sexist prejudices and attitudes, and we will influence the environment to modify them and promote values of respect and equality.- Situations of gender discrimination will be detected and actions and measures to correct them will be proposed.- The full integration of students who, for physical, sensory, mental or socio-cultural reasons, experience difficulties in gaining suitable, equal and beneficial access to university life will be facilitated.