Universida_{de}Vigo

IDENTIFYING DATA
Smart Manufacturing e Smart logistics

Subject	Smart Manufacturing e Smart logistics				
Code	V04M183V01106				
Study programme	Máster Universitario en Industria 4.0				
Descriptors	ECTS Credits		Choose	Year	Quadmester
	3		Mandatory	1st	1st
Teaching language	Spanish Galician English				
Department					
Coordinator	Peláez Lourido, Gustavo Carlos				
Lecturers	Peláez Lourido, Gustavo Carlos Suárez Alonso, Ramón Carlos Tjahjono , Benny Eko				
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General description	This course studies the basic principles of Smart Manufacturing and Smart Logistics, which are based on the exploitation of information accessible through multiple channels, to streamline business models and bring as close as possible the product/process/service customized to the final consumer, understood as the best value-cost perceived by that consumer.				

Skills

Code	
A1	Possess and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context
A2	Students should be able to apply their acquired knowledge and problem-solving skills in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study.
A3	Students are able to integrate knowledge and deal with the complexity of making judgements based on information which, being incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgements.
A4	Students should be able to communicate their findings - and the ultimate knowledge and reasons behind them - to specialist and non-specialist audiences in a clear and unambiguous manner
B1	Organization and planning skills
B6	Knowledge and use of the English language.
B7	Computer skills related to the field of study.
C13	Use the integration of different data sources for the definition of flexible, reliable and efficient supply chain management systems, supported by the Industrial Internet of Things and optimized logistics management software tools
C14	Know the concepts, principles and tools of intelligent manufacturing systems, which facilitate access to information and production data through automated tools for capturing, processing and displaying information
D1	Ability to understand the meaning and application of the gender perspective in different areas of knowledge and in professional practice with the aim of achieving a more just and equal society
D2	Incorporate criteria of sustainability and environmental commitment into professional practice. To acquire skills in the equitable, responsible and efficient use of resources
D3	Multidisciplinary teamwork

Learning outcomes

Expected results from this subject	Training and Learning Results

Get the understanding of the concepts that underlying Smart Manufacturing and Logistics	A1
	B6
	B7
	C14
Understand the different technologies that can potentially be adopted for Smart Manufacturing and Smart Logistics	A1
	A3
	B6
	B7
	C13
	C14
Know how to assess Industrial Internet of Things (IIoT) applications in the context of Manufacturing and Logistics	A2
	A3
	A4
	B1
	B6
	B7
	C13
	C14
	D1
	D2
Recognise the benefits and impacts of Smart Manufacturing on the Supply Chain, including Logistics	A3
	B1
	B6
	C13
	C14
	D1
	D2
	D3
Understand challenges and threats posed by the underlying technologies to Manufacturing and Logistics	A1
	A3
	A4
	B6
	B7
	C13
	C14
	D1
	D2
	D3

Contents

Topic	
The roles of manufacturing within the modern supply chain	
Typology of manufacturing systems	
Supply Chain Operations Reference (SCOR) model	
Manufacturing control systems	
Internet of Things applications in the manufacturing/production control systems	
Utilising cloud computing	
Industry 4.0 and its impact in manufacturing and the supply chain	
Benefits and challenges in the adoption of Industry 4.0	(*)- Equipos y dispositivos como ⬜activos inteligentes⬜ - Herramientas de Análisis de Negocio: Business intelligence. - Optimización de los procesos de Producción. - Sostenibilidad aplicada a la Fábrica Inteligente
Digital Readiness	
Intelligent Factories and Business Intelligence (BI)	- Equipment and devices as "intelligent assets" - Business Analysis Tools: Business intelligence. - Optimization of Production processes. - Sustainability applied to the Intelligent Factory

Planning

	Class hours	Hours outside the classroom	Total hours
Case studies	5	10	15
Practices through ICT	3	11	14
Portfolio/dossier	0.5	9	9.5

Lecturing	12	12	24
Objective questions exam	0.5	2	2.5
Systematic observation	2	0	2
Presentation	2	6	8

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Case studies	Analysis of a fact, problem or real event with the aim to know it, interpret, resolv, generate hypothesis, contrast data, reflect, complete knowledges, diagnosed and train in alternative procedures of solution.
Practices through ICT	Activities of application of knowledge in a given context and acquisition of basic and procedural skills related to the subject, through ICT.
Portfolio/dossier	Compilation of the work of the/the student with the objective to show his efforts, progresses and attainments in an area. The compilation owes to include contents chosen pole student/it, the criteria of selection and evidences of selfreflection.
Lecturing	Lecture by the professor of the content envelope to subject object of study, theoretical bases and/or guidelines of one work, exercise that the student has to develop

Personalized assistance

Methodologies	Description
Practices through ICT	Monitoring and individual evaluation of activities. Even if the activities are carried out autonomously, the students will have tutorial sessions at all times so that the teachers can monitor the activity.
Portfolio/dossier	Preparation of the materials, activities, etc., on which the students will work. Although the activities will be carried out autonomously, the students will have tutorial sessions at all times so that the teachers can monitor the activity

Tests	Description
Objective questions exam	Individualized attention to students during the tests. Review of tests and evaluation activities.
Presentation	Tracking the evolution of the workjob and help the students in the preparation of the presentation/exhibition.

Assessment

	Description	Qualification	Training and Learning Results			
Portfolio/dossier	Ojectives: Evaluate higher thinking skills. Assess analysis, synthesis and evaluation.	15	A1 A2 A3 A4	B1 B6	C13	D1 D2
Objective questions exam	Tests that evaluate knowledge that include closed questions with different answer alternatives (true/false, multiple choice, matching of elements...). Students select an answer from a limited number of possibilities (preferably four) with a reduction for failure of a value equal to the percentage of success (-0.25 pts. in the case of four possible answers if the value of the question is 1 pt.). The test of objective questions only evaluates knowledge. It does not evaluate skills or attitudes. It evaluates lower thinking. It evaluates knowledge, understanding and application.	20	A1 A3	B7	C14	
Systematic observation	Careful, rational, planned and systematic perception to describe and record the manifestations of student behaviour. It is possible to assess learning and actions and how they are carried out by evaluating order, precision, ability, efficiency... The aim is to evaluate higher thinking.	15	A1 A2 A3 A4	B1 B6	C13	D1 D2 D3
Presentation	Presentation by the students to the teacher and/or a group of students of an aspect on the contents of the subject or the results of a work, exercise, project... It can be carried out individually or in a group. In the presentation, knowledge, skills and attitudes are evaluated. The objectives are to evaluate higher thinking (analysis and synthesis).	50	A1 A2 A3 A4	B1 B6	C13 C14	D1 D2 D3

Other comments on the Evaluation

Students who do not pass the subject in continuous training at the first opportunity of each academic year, in which the distribution of evaluation weights is as stablished above, will have the possibility of having an exam of objective questions, worth 100% of the final mark, in successive calls that are not the first opportunity of each academic year.

Ethical commitment: Students are expected to behave ethically. If unethical behaviour is detected (copying, plagiarism, use of unauthorised electronic devices,...), the student will be considered to be ineligible to pass the subject. Depending on the type of unethical behaviour detected, it could be concluded that the student has not reached the necessary skills to overcome the subject. Students are expected to behave in a respectful and dignified manner and to collaborate with the teaching system, teaching staff, coordination and administrative and services personnel of the Master's degree. Any question due to the lack of ethical and dignified behaviour of the student body may have repercussions on the evaluation of the subject.

Sources of information

Basic Bibliography

Klaus Schwab, **The fourth industrial revolution**, Random House USA Inc, 2017

Alasdair Gilchrist, **Industry 4.0: the industrial internet of things**, 1st, Apress, 2016

Antonio Sartal, Diego Carou and J. Paulo Davim, **Enabling technologies for the successful deployment of industry 4.0**, CRC Press, 2020

Tjahjono, B., Esplugues, C., Ares, E., & Pelaez, G., **What does industry 4.0 mean to supply chain?**, 13, 1175-1182., Procedia Manufacturing, 2017

Gubbi, J., Buyya, R., Marusic, S., & Palaniswami, M., **Internet of Things (IoT): A vision, architectural elements, and future directions.**, Elsevier, 2013

Complementary Bibliography

Slama, D., Puhlmann, F., Morrish, J., & Bhatnagar, R. M., **Enterprise IoT: Strategies and Best practices for connected products and services**, 1st, O'Reilly Media, Inc, 2015

Recommendations