



Guía Docente

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Datos Identificativos				2023/24
Asignatura (*)	Simulación e Optimización de Procesos de Fabricación do Buque		Código	730542024
Titulación	Master Universitario Erasmus Mundus en Sostibilidade e Industria 4.0 aplicada ao Sector Marítimo			
Descritores				
Ciclo	Período	Curso	Tipo	Créditos
Mestrado Oficial	1º cuatrimestre	Segundo	Optativa	6
Idioma	Inglés			
Modalidade docente	Presencial			
Prerrequisitos				
Departamento	Empresa			
Coordinación	Pernas Álvarez, Javier	Correo electrónico	javier.pernas2@udc.es	
Profesorado	Lamas Rodríguez, Adolfo	Correo electrónico	adolfo.lamasr@udc.es	
	Pernas Álvarez, Javier		javier.pernas2@udc.es	
Web				
Descrición xeral	The goal of this subject is to provide a basic theoretical and practical understanding of modelling and simulation technologies (M&S) applied to shipbuilding. M&S is considered one of the Industry 4.0 technologies that allows shipyards to optimize manufacturing processes and logistics. The simulation software Flexsim will be used to solve practical cases based on real problems solved in shipyards.			

Competencias do título

Código	Competencias do título
B7	CG1 ? To display the adequate intercultural competence to successfully navigating within multicultural learning environments and to implement basic management principles suitable for a multicultural working environment.
B8	CG2 ? To express an attitude of intellectual inquisitiveness and open-mindedness.
B11	CG5 ? To have the capability to identify, formulate and solve engineering problems within realistic constraints.
B13	CG7 ? To have the capability to critically analyse, synthesise, interpret and summarise complex scientific processes.
C2	CT2 - Mastering oral and written expression in a foreign language.
C3	CT3 - Using ICT in working contexts and lifelong learning.
C4	CT4 - Acting as a respectful citizen according to democratic cultures and human rights and with a gender perspective.
C6	CT6 - Acquiring skills for healthy lifestyles, and healthy habits and routines.
C7	CT7 -Developing the ability to work in interdisciplinary or transdisciplinary teams in order to offer proposals that can contribute to a sustainable environmental, economic, political and social development.

Resultados da aprendizaxe

Resultados de aprendizaxe	Competencias do título		
To have basic knowledge about the modelling and simulation methodology.	BM6	CM2	
	BM7	CM3	
	BM10	CM4	
	BM12	CM6	
		CM7	
To solve realistic problems about process optimization and planning in shipyards using simulation.	BM6	CM2	
	BM7	CM3	
	BM10	CM4	
	BM12	CM6	
		CM7	

Contidos



Temas	Subtemas
Modelling and Simulation	The M&S methodology. M&S technologies. Simulation projects.
Model development in Flexsim	Flexsim basics. Fixed resource library. Task executors. Networks and conveyors. Introduction to process flows.
Shipbuilding processes	Cutting-welding. Block assembly. Outfitting. Painting. Blocks erection.
Shipyard simulation.	Material receipts. Assembly workstations. Blocks erection. Cranes. Planning.
Optimization	Input data analysis. Simulation experiments. Optimization concepts. Linear models. Heuristics. Evolutionary algorithms.

Planificación				
Metodoloxías / probas	Competencias	Horas presenciais	Horas non presenciais / traballo autónomo	Horas totais
Prácticas a través de TIC	A2 A3 B7 B8 B11 B13 C2 C3 C4 C6 C7	15	15	30
Estudo de casos	B7 B8 B11 B13 C2 C3 C4 C6 C7	4.5	22.5	27
Traballos tutelados	A2 A3 B7 B8 B11 B13 C2 C3 C4 C6 C7	1.5	40.5	42
Proba mixta	B7 B8 B11 B13 C2 C3 C4 C6 C7	2	2	4
Sesión maxistral	A2 A3 B8 B11 B13	21	21	42
Atención personalizada		5	0	5
*Os datos que aparecen na táboa de planificación son de carácter orientativo, considerando a heteroxeneidade do alumnado				

Metodoloxías	
Metodoloxías	Descrición
Prácticas a través de TIC	Solving practical problems and case studies using Flexsim.
Estudo de casos	Solving practical cases proposed by the teachers
Traballos tutelados	Simulation project proposed by the teachers
Proba mixta	Final exam about the contents of this subject.
Sesión maxistral	Lectures on the subject contents

Atención personalizada	
Metodoloxías	Descrición
Prácticas a través de TIC Proba mixta Sesión maxistral Estudo de casos Traballos tutelados	During tutorial time, students can meet the teachers to clarify the doubts of the subject, as well as the ones concerning the supervised projects

Avaliación			
Metodoloxías	Competencias	Descrición	Cualificación
Proba mixta	B7 B8 B11 B13 C2 C3 C4 C6 C7	Assessment of the final exam	20
Estudo de casos	B7 B8 B11 B13 C2 C3 C4 C6 C7	Assessment of the practical cases assigned to the students.	20

Trabajos tutelados	A2 A3 B7 B8 B11 B13 C2 C3 C4 C6 C7	Assessment of the supervised project assigned to the students.	60
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Observacións avaliación

Criterios de evaluación

Segunda oportunidade

Os criterios de avaliación son iguais tanto na primeira como na segunda oportunidade..

Cualificación 'Non Presentado'

Os alumnos que non fagan entrega do traballo tutelado terán cualificación de "Non presentado"

Información Adicional

De acordo co artigo 11, apartado 4 b) do Regulamento disciplinar do estudantado da UDC, o comportamento fraudulento en calquera dos apartados sometidos a avaliación suporá a cualificación de "Suspenso (0)" na avaliación final tanto na primeira como na segunda oportunidade e independentemente da oportunidade na que se cometese a falta.

General EMJMD Sustainable Ship and Shipping SEAS 4.0 evaluation rules:

- Students will have only two opportunities to pass a course. If failing to do so, they may be forced to leave the degree.
- No part time or lecture attendance exemption are allowed in this degree.

Fontes de información

Bibliografía básica	- Robinson, Stewart (2004). Simulation : The Practice of Model Development and Use. John Wiley & Sons - Flexsim (2022). Flexsim Tutorials. - Banks, Jerry Carson, Jhon S. Nelson, Barry L. Nicol, David M. (2010). Discrete-Event System Simulation. Prentice Hall
Bibliografía complementaria	

Recomendacións

Materias que se recomienda ter cursado previamente

Materias que se recomienda cursar simultaneamente

Materias que continúan o temario

Observaciones

To help in achieving a sustainable environment and to get the objective of number 5 action of the "Ferrol Green Campus Action Plan" (Healthy and environmentally and socially sustainable research and teaching): The assignments to be done in this course: - Will be required in digital format. - Will be delivered using Moodle, with no need to print them. In case it is necessary to print them: - Plastics won't be used. - Two side printing will be used. - Recycled paper will be used. - Printing drafts will be avoided. A sustainable use of the resources should be done, together with the prevention of negative impacts on the environment.In this course, an effort will be pursued towards the incorporation of gender inclusion aspects: no sexist language will be allowed, bibliography from authors of both genders will be used, and the participation of students of both gender in class will be promoted.The situations of gender discrimination will be detected, and actions will be implemented to correct them.The full integration of students who for physical, sensorial, psychic, or socio-cultural reasons may have difficulties in their academic life will be promoted.

(*)A Guía docente é o documento onde se visualiza a proposta académica da UDC. Este documento é público e non se pode modificar, salvo casos excepcionais baixo a revisión do órgano competente dacordo coa normativa vixente que establece o proceso de elaboración de guías