UNIVERSIDADE DA CORUÑA

Teaching Guide				
Identifying Data				2023/24
Subject (*)	Analysis and Optimization of the Life Cycle		Code	730496210
Study programme	Mestrado Universitario en Enxeñaría Naval e Oceánica (plan 2018)			
Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	1st four-month period	Second	Obligatory	4.5
Language	SpanishGalicianEnglish			
Teaching method	Face-to-face			
Prerequisites				
Department	Enxeñaría Naval e Industrial			
Coordinador	Castro Santos, Laura	E-mail	laura.castro.santos@udc.es	
Lecturers	Castro Santos, Laura	E-mail	laura.castro.santos@udc.es	
Web				
General description	A materia pretende conseguir un coñecemento da enxeñaría de sistemas aplicada á definición dun buque, artefacto ou plataforma marítima mediante a análise e optimización do seu ciclo de vida			

Study programme competences / results	
Code	Study programme competences / results
A14	A13 - Coñecemento da enxeñaría de sistemas aplicada á definición dun buque, artefacto ou plataforma marítima mediante a análise e optimización do seu ciclo de vida.
B5	CB10 Que os estudantes posúan as habilidades de aprendizaxe que lles permitan continuar estudando dun modo que haberá de ser en boa medida autodirixido ou autónomo.
B6	G01 Capacidade para resolver problemas complexos e para tomar decisións con responsabilidade sobre a base dos coñecementos científicos e tecnolóxicos adquiridos en materias básicas e tecnolóxicas aplicables na enxeñaría naval e oceánica, e en métodos de xestión.
B11	G06 Capacidade para realizar investigación, desenvolvemento e innovación en produtos, procesos e métodos navais e oceánicos.
B12	G07 Capacidade de integración de sistemas marítimos complexos e de tradución en solucións viables.
C2	C1 Capacidade pra desenrolar a actividade profesional nun entorno multilingue
C3	ABET (a) An ability to apply knowledge of mathematics, science, and engineering.
C4	ABET (b) An ability to design and conduct experiments, as well as to analyze and interpret data.
C7	ABET (e) An ability to identify, formulate, and solve engineering problems.
C12	ABET (j) A knowledge of contemporary issues.
C13	ABET (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Learning outcomes			
Learning outcomes	Study programme competences / results		
Knowledge of systems engineering applied to the definition of a ship, artifact or maritime platform through the analysis and optimization of its life cycle.	AJ13	BC5 BJ1 BJ6 BJ7	CC2 CC3 CC4 CC7 CC12 CC13

Contents	
Topic	Sub-topic

The following blocks or themes develop the contents established in the Verification Report, which are:	- General concepts. - Introduction to systems engineering. - Systems utility. - Logistics planning. - Logistics in the life cycle of the system. - Logistics Management. - Life cycle cost analysis.
BLOCK I: GENERAL CONCEPTS	Unit 1: Introduction to sustainability. Unit 2: Introduction to the circular economy. Unit 3: Transition management.
BLOCK II: SYSTEMS ENGINEERING AND LIFE CYCLE LOGISTICS	Unit 4: Introduction to systems engineering. Utility of the systems. Unit 5: Logistics planning. Logistics in the life cycle of the system. Logistics Management.
BLOCK III: LIFE CYCLE ANALYSIS AND LIFE CYCLE COST ANALYSIS	Unit 6: Quantitative and qualitative methods that support life cycle assessment. Unit 7: Life cycle analysis. Normative. Unit 8: Life cycle analysis. stages. Unit 9: Tools for the application of life cycle analysis. Unit 10: Analysis of the life cycle cost.

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A14 B5 B6 B11 B12 C2 C3 C4 C7 C12 C13	20	17.5	37.5
Problem solving	A14 B5 B6 B11 B12 C2 C3 C4 C7 C12 C13	10	15	25
Supervised projects	A14 B5 B6 B11 B12 C2 C3 C4 C7 C12 C13	4	20	24
Case study	A14 B5 B6 B11 B12 C2 C3 C4 C7 C12 C13	10	15	25
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	Oral presentation complemented by the use of audiovisual media and the introduction of some questions addressed to the students, in order to transmit knowledge and facilitate learning. It will be possible to attend a conference in the field of the subject.
Problem solving	Applied learning method in which student is required to use knowledge gained from study to propose a solution to a specific problem, where more than one solution may be possible.
Supervised projects	Supervised learning process aimed at helping students to work independently in a range of contexts (academic and professional). Focused primarily on learning ?how to do things? and on encouraging students to become responsible for their own learning.

Case study	Teaching-learning method in which students are presented with a specific set of real-life circumstances and a problem (?case?) which they must attempt to understand, assess and solve as a group through a process of discussion. Students should be able to analyse a series of facts relating to a particular area of knowledge or activity, and arrive at a rational conclusion via a process of discussion within small work groups.

Personalized attention	
Methodologies	**Description**
Problem solving Supervised projects Case study	Supervised projects, problem solving and case studies will be proposed throughout the course, so students will be guided in their development, requiring personalized attention.

Assessment			
Methodologies	**Competencies / Results**	**Description**	**Qualification**
Supervised projects	A14 B5 B6 B11 B12 C2 C3 C4 C7 C12 C13	It will consist in the accomplishment of one or several deliveries during the course	100

Assessment comments
Students with recognition of part-time dedication and academic exemption from attendance will be evaluated in the same way as general students. The evaluation criteria for the second opportunity are the same as those for the first opportunity. In this context, the approved parts will be saved for the second chance. The evaluation criteria for the extraordinary call are the same as those for the first opportunity. Note: In the creation of works, plagiarism and the use of non-original material, including that obtained through the Internet, without an express indication of its origin and, as the case may be, without the permission of its author, may be considered cause of suspension qualification in the activity. All of that without prejudice to the disciplinary responsibilities that could take place after the corresponding procedure.

Sources of information	
Basic	- Sergio Álvarez Gallego (2017). La huella de carbono y el análisis del ciclo de vida. AENOR - Carlos Ruiz Amador (2012). Análisis del ciclo de vida y huella de carbono. UNED - Alfonso Aranda Usón (2006). El análisis del ciclo de vida como herramienta de gestión empresarial. Confederación Confemetal - ISO (2016). ISO 14040:2006 Environmental management ? Life cycle assessment ? Principles and framework. ISO - H. Scott Matthews; Chris T. Hendrickson; Deanna H. Matthews (2015). Life Cycle Assessment: Quantitative Approaches for Decisions That Matter.
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

(A) To help achieve an immediate sustainable environment and comply with the Green Campus Ferrol action plan:1. The delivery of documentary work carried out in this subject: 1.1. It will be requested in digital format and/or computer support. 1.2. It will be done through Moodle, in digital format without the need to print them.2.
The importance of ethical principles related to the values of sustainability in personal and professional behavior must be taken into account.(B) In relation to the gender perspective:1. As stated in the different university teaching regulations, the gender perspective must be incorporated in this matter (non-sexist language will be used, a bibliography of authors of both sexes will be used, student participation in class will be encouraged...).2. Work will be done to identify and modify prejudices and sexist attitudes and influence the environment to modify them and promote values of respect and equality.3. Situations of discrimination based on gender must be detected and actions and measures to correct them will be proposed.