Teaching Guide					
Identifying Data					2019/20
Subject (*)	Quality engineering and environment			Code	730G05021
Study programme	Grao en Enxeñaría Naval e Oceánica				
Descriptors					
Cycle	Period	Year		Type	Credits
Graduate	1st four-month period	Third		Obligatory	4.5
Language	Spanish				
Teaching method	Face-to-face				
Prerequisites					
Department	Enxeñaría Naval e IndustrialQuímica				
Coordinador	Rodriguez Guerreiro, Maria Jesus		E-mail	maria.guerreiro@udc.es	
Lecturers	Rodriguez Guerreiro, Maria Jesus		E-mail	maria.guerreiro@udc.es	
Web					
General description	Coñecemento do medio mariño e a súa reglamentación (Convenio Marpol), contaminación mariña e impacto ambiental. Xestión da calidade e xestión medioambiental en buques.				

Study programme competences / results	
Code	Study programme competences / results
A17	Knowledge of the systems for evaluation of the quality, and of the norm and means related to the safety and environmental protection.
B2	That the students know how to apply its knowledge to its work or vocation in a professional way and possess the competences that tend to prove itself by the elaboration and defense of arguments and the resolution of problems in its area of study
B3	That the students have the ability to bring together and to interpret relevant data (normally in its area of study) to emit judgments that include a reflection on relevant subjects of social, scientific or ethical kind
B4	That the students can transmit information, ideas, problems and solutions to a public as much specialized as not specialized
B6	Be able to carrying out a critical analysis, evaluation and synthesis of new and complex ideas.
C1	Using the basic tools of the technologies of the information and the communications (TIC) necessary for the exercise of its profession and for the learning throughout its life.
C2	Coming across for the exercise of a, cultivated open citizenship, awkward, democratic and supportive criticism, capable of analyzing the reality, diagnosing problems, formulating and implanting solutions based on the knowledge and orientated to the common good.
C4	Recognizing critically the knowledge, the technology and the available information to solve the problems that they must face.
C5	Assuming the importance of the learning as professional and as citizen throughout the life.
C6	Recognizing the importance that has the research, the innovation and the technological development in the socioeconomic and cultural advance of the society.

Learning outcomes			
Learning outcomes	Study programme competences / results		
Knowledge of the systems for the evaluation of the Quality, as well as of the regulations and the means related to safety and environmental protection	A17	B2 B3 B4 B6	C1 C2 C4 C5 C6
Knowing the marine environment, the importance it has on the sea, its consequences and impact, as well as the quality and environmental management applied to the sector	A17	B2 B3 B4 B6	C1 C2 C4 C5 C6

Contents	
Topic	**Sub-topic**
The following topics develop the established contents of the verification memory card, which are:	I Environment II Marine Regulation III Quality
The marine ecosystems	1. The physical environment 2. The biological environment 3. Marine communities: Red tides and coral reefs 4. Degradation of ecosystems. Eutrophication. Seawater self-cleaning capacity
Marine pollution and environmental impact	1. Routes of entry of pollutants into the aquatic environment 2. Main pollutants 3. Accidental discharges to the sea. Corrective measures. Fight against marine pollution 4. Pollution and fisheries resources
Atmosphere	1. Air pollution 2. Atmospheric pollutants 3. Pollution control 4. Greenhouse effect. Depletion of the stratospheric ozone layer
Marine regulation. MARPOL Convention	1. Oil pollution 2. Contamination by liquid noxious substances transported in bulk 3. Contamination by ship's garbage 4. Air pollution caused by ships
Basic concepts of quality	1. Introduction Definition 2. Quality management. Definition. Fundamentals and strategies 3. The EFQM model
Management and Tools of quality	1. Introduction Definition 2. Quality management. Definition. Fundamentals and strategies 3. The EFQM model
The ISO 9001 standard	1. Concepts: Standardization, Certification and Accreditation 2. Normative ISO 9001: 2008 3. Requirements of the Standard
Basic concepts of the environment	1. Economy and means 2. Company and medium 3. Business strategy and medium
Environmental Management Tools	1. Environmental impact assessment 2. Life cycle analysis 3. Ecodesign 4. Other tools: Ecolabel, Ecological marketing and environmental management systems and environmental audit
The ISO Standards and the EMAS regulation	1. Introduction and objectives 2. The ISO 14001 standard 3. The EMAS regulation
Integration of management systems	1. Characteristics of an integrated system 2. Implementation and certification of ESO 9001 and ESO 14001 standards
Environmental Quality Audit	1. Definition and types of audits 2. The quality auditor and the environment 3. Stages of the audit process

Planning

Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Problem solving	B2 C2	6	6	12
Supervised projects	B3 C4 C5 C6	3	30	33
Laboratory practice	B4 C1	12	12	24
Mixed objective/subjective test	A17 B2 B3 B4 B6	3	0	3
Field trip	A17 B2 B3 B4 B6	5	0	5
Guest lecture / keynote speech	A17	17	17	34
Personalized attention		1.5	0	1.5
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	Description
Problem solving	1. WASTE TREATMENT EQUIPMENT IN THE NAVAL SECTOR (SEPARATOR OF SENTINES) 2. WASTE TREATMENT EQUIPMENT IN THE NAVAL SECTOR (RESIDUAL WATER TREATMENT PLANT) 3. WASTE TREATMENT EQUIPMENT IN THE NAVAL SECTOR (HEAT TREATMENT PLANT) 4. WASTE TREATMENT EQUIPMENT IN THE NAVAL SECTOR (ORGANIC WASTE TREATMENT EQUIPMENT)
Supervised projects	1. Operation and maintenance of a water purification plant (water treatment). Application to the ship 2. Alternative energies. Application on ships 3. Ballast water. Environmental Issues. Treatments 4. Environmental management tools. Unit IX 5. Integration of management systems. Teaching unit XI 6. Audit of quality and environment. Teaching unit XII 7. Control of air pollution 8. Fight against hydrocarbon contamination
Laboratory practice	1. Determination of pH, temperature and conductivity of different types of water 2. Determination of chlorides in waters 3. Determination of wool hardness in waters 4. Determination of phosphates in waters 5. Determination of dissolved oxygen in waters 6. Determination of suspended solids in waters
Mixed objective/subjective test	Exam of the agenda of the lectures, of the information received in the seminars and in the technical visits and of the works presented by the students
Field trip	1. TECHNICAL VISIT TO THE ENVIRONMENT CLASSROOM ANTONIO DE ESCAÑO (ARSENAL DE FERROL) 2. TECHNICAL VISIT TO A VESSEL (FRAGATA F-100) (ARSENAL DE FERROL) 3. TECHNICAL VISIT SASEMAR (MARITIME SAFETY AND SECURITY COMPANY (FERROL) 4. TECHNICAL VISIT DON INDA VESSEL (CEE- A CORUÑA)
Guest lecture / keynote speech	Presentation in Power Point of the Didactic Units.

Personalized attention	
Methodologies	Description
Supervised projects Problem solving	Students will have personalized attention from the teacher: face-to-face tutorials and / or email and follow-up of works and exposure of doubts through the Moodle platform.

Assessment			
Methodologies	Competencies / Results	Description	**Qualification**

Supervised projects	B3 C4 C5 C6	Preparation of a supervised work and oral presentation of the same	25
Problem solving	B2 C2	Collaborative learning, Directed discussion	5
Laboratory practice	B4 C1	Active participation in the development of the practices. It will be mandatory to provide a report of each of the practices	5
Mixed objective/subjective test	A17 B2 B3 B4 B6	Final exam of the subject taught in the lectures, information obtained in seminars and laboratory practices, as well as the exhibition of student work	60
Field trip	A17 B2 B3 B4 B6	Technical visits applied to the theory of the subject	5

Assessment comments
Attendance at Seminars is mandatory to obtain a score of 0.5 points. Attendance at Technical Visits is mandatory to obtain a score of 0.5 points. Attendance at laboratory practices is mandatory. The subject will not be approved without attending the laboratory practices. Students who obtain a proof for not attending laboratory practices, must perform an examination of them / them at the end of the first semester, to obtain the approved of said / as / as. It will be compulsory to pass the course to submit a paper (Word format) and to make its presentation (Power point format) on the days established by the teacher with the corresponding publication in Moodle. To pass the subject it will be necessary to obtain a minimum of 2.5 points in the exam on 6 to assess the other activities. Waiver of this subject: students with part-time enrollment will have to perform all the following compulsory activities: attendance to laboratory practices (12 hours) and presentation of the supervised work (2h), being exempt from 70% of the attendance of the subject . In this way students with dispensation will not enjoy the attendance score for seminars and technical visits (1 point). Except for the previous point, the evaluation is the same for all students. For students who take the second chance exam they will have to meet the same criteria specified for the first opportunity

Sources of information	
Basic	- 2. J. M. PERÉS (1980). La polución de las aguas marinas. BARCELONA: OMEGA - 3. MARIANO SEOANE CALVO (2000). Manual de contaminación marina y restauración del litoral. MADRID: EDICIONES MUNDIPRENSA - 4. JOSE MARÍA SILOS RODRÍGUEZ (2008). Manual de lucha contra la contaminación.. CÁDIZ: UNIVERSIDAD DE CÁDIZ - 5. ORGANIZACIÓN MARITIMA INTERNACIONAL (2013). MARPOL. lONDRES: ORGANIZACIÓN MARITIMA INTERNACIONAL - 6. ENRIQUE CLAVER, JOSÉ FRANCISCO MOLINA Y JUAN JOSÉ TARÍ (2011). Gestión de la calidad y gestión medioambiental. MADRID: PIRÁMIDE - PABLO ALCALDE SAN MIGUEL (2010). CALIDAD. MADRID: PARANINFO S.A.
Complementary	- 12. JAIRO ALBERTO ROMERO (1999). Potabilización del agua. MÉJICO: ALFAOMEGA

Recommendations
Subjects that it is recommended to have taken before

CHEMISTRY/730G01104
Subjects that are recommended to be taken simultaneously
SHIPBUILDING TECHNOLOGY I/730G01124
Subjects that continue the syllabus
Other comments
The importance of ethical principles related to the values of sustainability in personal and professional behavior must be taken into account. "To help achieve a sustained immediate environment and meet the objective of action number 5:" Healthy and sustainable environmental and social teaching and research "of the" Green Campus Ferrol Action Plan ": The delivery of the documentary works that are made in this matter: ? Will be requested in virtual format and / or computer support ? It will be done through Moodle, in digital format without the need to print them ? If it is necessary to make them on paper: - Plastics will not be used - Double-sided prints will be made. - Recycled paper will be used. - Printing of drafts will be avoided.

(*)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.