SUBJECT TEACHING GUIDE

G451 - Chemistry

First Degree in Nautical Engineering and Maritime Transport

Academic year 2026-2027

1. IDENTIFYING DATA					
Degree	First Degree in Nautical Engineering and Maritime Transport			Type and Year	Core. Year 1
Faculty	School of Maritime Engineering				
Discipline	Subject Area: Chemistry Basic Training Module				
Course unit title and code	G451 - Chemistry				
Number of ECTS credits allocated	6	Term		Semester based (1)	
Knowledge Field	Industrial engineering, mechanical engineering, automation engineering, industrial organization engineering and navigation engineering				
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. DE QUIMICA E INGENIERIA DE PROCESOS Y RECURSOS.
Name of lecturer	GEMA RUIZ GUTIERREZ
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Other lecturers	ALBERTO COZ FERNANDEZ CARLOS ARCE GUTIERREZ

4. OBJECTIVES

Basic chemistry for Maritime Engineering, Marine Engineering and Nautical Engineering.
- Chemical behaviour, chemical reactions in water and calculus.
- Physico-chemical behaviour of gases, liquids and their properties. Physico-chemical operations.
- Inorganic formulation and general information about organic compounds.
- Fuels and lubricants. Chemistry in fire behaviour

6. SUBJECT PROGRAM

CONTENTS	
1	Topic 1 THEORY: INTRODUCTION TO CHEMISTRY IN ENGINEERING Elements, Compounds, Periodic Table, Chemical Bonding, Stoichiometry. PROBLEM SOLVING/QUESTIONS PRACTICE 1. Safety in chemistry laboratories. ASSIGNMENT PART 1. General rules and groups
2	Topic 2 THEORY: PHYSICAL AND CHEMICAL PROPERTIES APPLIED IN ENGINEERING States of matter, Properties of gases, liquids, and solids, Changes of state, Mixtures and solutions, Physical and chemical separation processes. PROBLEM SOLVING/QUESTIONS PRACTICE 2: Water analysis PART 2 WORK. Group work development
3	Topic 3 THEORY: CHEMICAL TRANSFORMATIONS IN ENGINEERING Reaction rate, Chemical equilibrium, Proton transfer equilibrium, Electron transfer reactions, base, precipitation, and redox reactions. PROBLEM SOLVING/QUESTIONS PRACTICE 3 Study of the acid and base properties of solutions. PART 3 WORK. Continuation of the group work.
4	Tema 4 TEORÍA: LA QUÍMICA DE LOS COMBUSTIBLES Y LUBRICANTES Definición, Formulación y Propiedades de combustibles y lubricantes, Calor en las reacciones químicas, Química en fuegos tipo A, B, C, D y F. Contaminación marina: cuestiones generales, efectos de contaminación por hidrocarburos y productos químicos. RESOLUCIÓN DE PROBLEMAS/CUESTIONES PRÁCTICA 5 Propiedades físico-químicas de los hidrocarburos: Viscosidad, densidad, inflamabilidad. TRABAJO PARTE 4. Exposición de los trabajos Final exams.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Homeworks	Work	No	No	10,00
Laboratory work	Laboratory evaluation	No	No	30,00
evaluation exams	Written exam	No	Yes	60,00
TOTAL				100,00

Observations

To pass by continuous assessment, the four parts will be taken into account: the submission of exercises and problems collected during the classes, the laboratory and work practices and evaluation exams 1 and 2. The final grades of the ordinary and extraordinary calls will be determined considering the following percentages: 10% the submission of exercises and/or problems, 30% the laboratory and work practices, 30% evaluation exam 1 and 30% evaluation exam 2.

Observations for part-time students

For part-time students, the exam in the ordinary and extraordinary sessions can count for 100% of the grade, unless they have also submitted the work and done the laboratory practices, in which case the corresponding percentage will be applied.

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
Baber, J. A.; Ibarz, J. Química general moderna. Ed. Marín, S.A.
Brown, T.; LeMay, Jr.; Bursten, B. Química La ciencia central. Editorial Prentice Hall Hispanoamericana SA.
Chang, R. Química. Editorial Mc Graw Hill. México.
García, J. A.; González, M.A. Química. Ed. Tebar Flores.
Ibarz, J. Problemas de Química General Ed. Marín S.A.
López, J.A. Problemas de química: cuestiones y ejercicios. Ed. Prentice Hall.
Morcillo, J. Temas básicos de química. Ed. Alhambra.
Orozco, C.; González, Mª N.; Pérez, A. Problemas resueltos de química aplicada. Ed. Paraninfo
Peterson, W. R. Nomenclatura de química inorgánica (IUPAC). Ed. Eunibar.
Petrucci, B.; Harwood, C.; Herring, R.H. Química General. Ed. Prentice Hall.
Whitten, K.W.; Gailey, K.D.; Davis, R.E. Química genera. Ed. McGraw-Hill.
Yen, T.F. Chemistry for engineers. Ed. Imperial College Press, cop.
Atkins, P.; Jones, L. Química. Moléculas. Materia. Cambio. Ed. Omega S.A.