# SUBJECT TEACHING GUIDE

## G448 - MATHEMATICS II

### Degree in Marine Engineering
### First Degree in Marine Engineering

Academic year 2023-2024

| 1. IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| Degree | Degree in Marine Engineering<br>First Degree in Marine Engineering | | Type and Year | Core. Year 1<br>Core. Year 1 |
| Faculty | School of Maritime Engineering | | | |
| Discipline | Subject Area: Mathematics<br>Basic Training Module | | | |
| Course unit title and code | G448 - MATHEMATICS II | | | |
| Number of ECTS credits allocated | 6 | Term | Semester based (2) | |
| Web | | | | |
| Language of instruction | Spanish | English Friendly | No | Mode of delivery | Face-to-face |

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|---|---|
| Department | DPTO. MATEMATICAS, ESTADISTICA Y COMPUTACION |
| Name of lecturer | TOMAS MARTIN HERNANDEZ |
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| Office | E.T.S. de Náutica. Planta: + 2. DESPACHO (234) |
| Other lecturers | |

## 3.1 LEARNING OUTCOMES

- Perform basic calculations with real and complex numbers and know the most important real and complex functions.
  Represent real functions using analytical calculation techniques.
  Simplify geometric-analytical problems using suitable coordinates changes.
  Calculate relative maxima and minima of real functions in one and two variables.
  Master the basic techniques of definite and indefinite integration in one and two variables.
  Apply the above techniques to calculate lengths, areas and volumes.
  Solving equations and systems of differential equations with constant coefficients .
  Use solving differential equations to approach and solve scientific and technical problems of basic level .
  Solve astronomical positioning with one and two stars.
  Acquire sufficient handling with the computer to perform the above skills quickly and effectively with your help and the appropriate mathematical software.
  Binomial distribution, Poison distribution and Normal distribution.

## 4. OBJECTIVES

Know and handle the basic topics of mathematical analysis necessary for the mathematical modeling of basic scientific and technical problems with implications to engineering

## 6. COURSE ORGANIZATION

| CONTENTS | |
|---|---|
| 1 | Real numbers and complex numbers. Absolute and relative error. First properties. |
| 2 | Analysis Calculus: Limits. Continuity. Differential calculus in one and two variables. Integration calculus in one and two variables. Differential equations with constant coefficients . |
| 3 | Astronomical positioning and loxodromic navigation. |
| 4 | Binomial distribution, Poison distribution and Normal distribution. |

## 7. ASSESSMENT METHODS AND CRITERIA

| Description | Type | Final Eval. | Reassessn | % |
|---|---|---|---|---|
| First exam | Written exam | No | Yes | 35,00 |
| Questionnaires and class assignments | Activity evaluation with Virtual Media | No | No | 15,00 |
| Final exam | Written exam | Yes | Yes | 50,00 |
| TOTAL | | | | 100,00 |
| Observations | | | | |
| Observations for part-time students | | | | |
| The part-time student enrolled will have facilities in conducting virtual activities. | | | | |

## 8. BIBLIOGRAPHY AND TEACHING MATERIALS

### BASIC

T. Martín: "Fundamentos Matemáticos". Ediciones TGD. Santander. 2016.

T. Martín: "Fundamentos Matemáticos" (Asignatura incluida dentro del proyecto Open Course Ware de la Universidad de Cantabria).
http://ocw.unican.es/ciencias-experimentales/fundamentos-matematicos