Course guide
280636 - 280636 - Fundamentals of Mathematics II

Unit in charge: Barcelona School of Nautical Studies
Teaching unit: 749 - MAT - Department of Mathematics.

Degree: BACHELOR’S DEGREE IN MARINE TECHNOLOGIES (Syllabus 2010). (Compulsory subject).
BACHELOR’S DEGREE IN NAVAL SYSTEMS AND TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).

Academic year: 2023  ECTS Credits: 6.0  Languages: Catalan

LECTURER

Coordinating lecturer: MARIA ÂNGELA GRAU GOTÉS
Primer quadrimestre: MARIA ÂNGELA GRAU GOTÉS - Grup: GESTN, Grup: GTM

Others: Primer quadrimestre: MARIA ÂNGELA GRAU GOTÉS - GESTN, GTM
Segon quadrimestre: FRANCESC TIÑENA SALVAÑÀ - GESTN, GTM

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUOTES

Specific:
GTM.CE0. Ability to solve math problems that may arise in engineering. Ability to apply knowledge about: linear algebra, geometry, differential geometry to, differential and integral calculus, differential equations and partial differential, numerical methods, algorithmic numerical and statistical optimization.
GESTN.CE1. Ability to solve math problems that may arise in the field of naval engineering technology. Ability to apply knowledge of: linear algebra, geometry, differential geometry, differential and integral calculus, differential equations and partial, numerical methods, numerical algorithms, statistical and optimization.

TEACHING METHODOLOGY

- Receive, understand and summarize knowledge.
- Posing and solving problems.
- Developing arguments from a critical point of view and defending them.
- Doing work in group and individually.

LEARNING OBJECTIVES OF THE SUBJECT

- To be able to apply the knowledge on basic functions, differential and integral calculus, numerical methods and statistics.
- To solve the mathematical problems that arise in engineering.
- To develop the capacity of abstraction while solving problems.
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>30.0</td>
<td>20.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90.0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>30.0</td>
<td>20.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

1. Functions
Description:
Functional relations, properties and operations. Elementary functions: polinomials, rational functions, potencial, exponential and trigonometric functions. Inverse functions. Functions in 1 and 2 variables, curves and surfaces.

Full-or-part-time: 17h 30m
Theory classes: 7h
Self study: 10h 30m

2. Differentiation
Description:

Full-or-part-time: 35h
Theory classes: 14h
Self study: 21h

3. Integration
Description:

Full-or-part-time: 25h
Theory classes: 10h
Self study: 15h

4. Series of functions
Description:

Full-or-part-time: 17h 30m
Theory classes: 7h
Self study: 10h 30m
5. Ordinary differential equations

**Description:**

**Full-or-part-time:** 27h 30m
Theory classes: 11h
Self study: 16h 30m

6. Numerical methods

**Description:**

**Full-or-part-time:** 12h 30m
Theory classes: 5h
Self study: 7h 30m

7. Statistics

**Description:**

**Full-or-part-time:** 15h
Theory classes: 6h
Self study: 9h

**GRADING SYSTEM**

The final grade, \( N_{final} \), is highest of \( N_{mig} \) and \( N_{pf} \)
\[
N_{final} = \max(N_{mig}, N_{pf})
\]
where: \( N_{mig} = 0.40 \times N_{ac} + 0.60 \times N_{pf} \)

\( N_{pf} \): grade of final test,
\( N_{ac} \): continuous grade.

The final test consist of same theoretical questions about concepts related to the course' learning aims, and a set of problems that require the application of the methods studied. Its duration is 3 hours.
The continuous grade consist of two or tree test (each one hour long), and the supervised activities carried out during the semester.

Reevaluation: If you have obtained a grade between 3 and 4.9, you can choose to reassessment will consist of a final test similar to the one described above.

**EXAMINATION RULES.**

- If some of activities of the continuous grade are missed, the continuous grade is 0.
- Those who do not appear in the final test and do not carry out any of the activities of the continuous assessment are considered "Not Presented"
BIBLIOGRAPHY

Basic:

Complementary: