280605 - Fundamentals of Mathematics II

Coordinating unit: 280 - FNB - Barcelona School of Nautical Studies
Teaching unit: 749 - MAT - Department of Mathematics
Academic year: 2018
Degree: BACHELOR'S DEGREE IN NAUTICAL SCIENCE AND MARITIME TRANSPORT (Syllabus 2010).
(Teaching unit Compulsory)
ECTS credits: 6

Teaching staff
Coordinator: MARIA MONTSERRAT VELA DEL OLMO
Others:
Primer quadrimestre:
- JOAN CARLES LARIO LOYO - 1
- MARIA MONTSERRAT VELA DEL OLMO - 1

Segon quadrimestre:
- MARIA MONTSERRAT VELA DEL OLMO - 1

Degree competences to which the subject contributes

Specific:
1. 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.

Teaching methodology

(ENG) 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.
# 280605 - Fundamentals of Mathematics II

## Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 30h</th>
<th>20.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>20.00%</td>
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<tr>
<td></td>
<td>30h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hours small group:</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>0h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Self study:</td>
<td>60.00%</td>
</tr>
<tr>
<td></td>
<td>90h</td>
<td></td>
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</tbody>
</table>
## Content

<table>
<thead>
<tr>
<th>/ ENG) Functions.</th>
<th>Learning time: 20h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 8h</td>
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<tr>
<td></td>
<td>Self study : 12h</td>
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</tbody>
</table>

**Description:**
(ENG) Functional relations, properties and operations. Elementary functions: polynomials, rationals, exponentials, logarithm and trigonometric functions. Inverse functions. Functions in 1 i 2 variables, curves and surfaces.

**Related activities:**
(ENG)

**Specific objectives:**
(ENG)

<table>
<thead>
<tr>
<th>(ENG) Derivation.</th>
<th>Learning time: 35h</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 14h</td>
</tr>
<tr>
<td></td>
<td>Self study : 21h</td>
</tr>
</tbody>
</table>

**Description:**

**Related activities:**
(ENG)

**Specific objectives:**
(ENG)

<table>
<thead>
<tr>
<th>(ENG) Integration.</th>
<th>Learning time: 25h</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 10h</td>
</tr>
<tr>
<td></td>
<td>Self study : 15h</td>
</tr>
</tbody>
</table>

**Description:**

**Related activities:**
(ENG)

**Specific objectives:**
(ENG)
### (ENG) Ordinary Differential equations.

**Learning time:** 15h  
Theory classes: 6h  
Self study: 9h

**Description:**  

**Related activities:**
(ENG)

**Specific objectives:**
(ENG)

### (ENG) Numerical Methods.

**Learning time:** 15h  
Theory classes: 6h  
Self study: 9h

**Description:**  

**Related activities:**
(ENG)

**Specific objectives:**
(ENG)

### (ENG) Statistics.

**Learning time:** 20h  
Theory classes: 8h  
Self study: 12h

**Description:**  

**Related activities:**
(ENG)

**Specific objectives:**
(ENG)
Qualification system

The final grade is the sum of the following partial grades:

\[
N_{\text{final}} = 0.60 \times N_{\text{pf}} + 0.40 \times N_{\text{ac}}
\]

where

- \( N_{\text{final}} \): final grade.
- \( N_{\text{pf}} \): grade of the final test.
- \( N_{\text{ac}} \): continuous grade.

The final test consist of some theoretical questions about concepts realated 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 one or two test (each one hour long), and the supervised activities carried out during the semester.

Regulations for carrying out activities

- If some of the activities of the continuous grade are missed, the continuous grade is 0.
- A student which does not make the final test or the test for the continuous grade is being considered as 'No Presentat'.

Bibliography

Basic:


Complementary: