340366 - FOMA-I1043 - Fundamentals of Mathematics

Coordinating unit: 340 - EPSEVG - Vilanova i la Geltrú School of Engineering
Teaching unit: 743 - MA IV - Department of Applied Mathematics IV
Academic year: 2015
Degree: BACHELOR’S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2010). (Teaching unit Compulsory)
ECTS credits: 7.5

Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: M.Luisa Zaragozá
Joan Gómez i Urgellés
Others: Joan Gómez

Opening hours

Timetable:

Prior skills

Requirements

Degree competences to which the subject contributes

Specific:
I_CEFC6. CEFC6. Basic knowledge and application of algorithmic processes, informatic techniques to design solutions of problems, analyzing if proposed algorithms are apt and complex.

Transversal:
05 TEQ N1. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.
04 COE N1. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1. Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.
2. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.
05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
07 AAT N2. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.

Teaching methodology

Learning objectives of the subject
### Study load

<table>
<thead>
<tr>
<th>Study load</th>
<th>Hours large group:</th>
<th>Hours medium group:</th>
<th>Hours small group:</th>
<th>Guided activities:</th>
<th>Self study:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total learning time:</strong> 187h 30m</td>
<td>75h</td>
<td>0h</td>
<td>0h</td>
<td>0h</td>
<td>112h 30m</td>
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<tr>
<td></td>
<td>40.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
### Content

<table>
<thead>
<tr>
<th>Learning time: 8h 40m</th>
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</thead>
<tbody>
<tr>
<td>Theory classes: 5h 20m</td>
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<tr>
<td>Self study: 3h 20m</td>
</tr>
</tbody>
</table>

**Description:**

**Related activities:**

**Specific objectives:**

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<table>
<thead>
<tr>
<th>Learning time: 10h 50m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes: 5h</td>
</tr>
<tr>
<td>Self study: 5h 50m</td>
</tr>
</tbody>
</table>

**Description:**

**Related activities:**

**Specific objectives:**

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<table>
<thead>
<tr>
<th>Learning time: 8h 40m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes: 3h 20m</td>
</tr>
<tr>
<td>Practical classes: 0h</td>
</tr>
<tr>
<td>Self study: 5h 20m</td>
</tr>
</tbody>
</table>

**Description:**

**Related activities:**

**Specific objectives:**
# 340366 - FOMA-I1043 - Fundamentals of Mathematics

## 2. Vector spaces

**Description:**
How to determine the dependence / independence of vectors and calculate dimensions and bases of a subspace.

3. Linear independence of vectors.
4. Dimension and basis of a vector space.

**Specific objectives:**

<table>
<thead>
<tr>
<th>Learning time</th>
<th>Theory classes</th>
<th>Practical classes</th>
<th>Self study</th>
</tr>
</thead>
<tbody>
<tr>
<td>32h</td>
<td>12h</td>
<td>0h</td>
<td>20h</td>
</tr>
<tr>
<td>Description:</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Related activities:</td>
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</table>

## 3. Linear maps

**Description:**

<table>
<thead>
<tr>
<th>Learning time</th>
<th>Theory classes</th>
<th>Practical classes</th>
<th>Self study</th>
</tr>
</thead>
<tbody>
<tr>
<td>36h</td>
<td>14h</td>
<td>0h</td>
<td>22h</td>
</tr>
</tbody>
</table>

**Specific objectives:**

| Description:  |                |                   |            |
| Related activities: |            |                   |            |

## 6. Differential calculus

**Description:**

<table>
<thead>
<tr>
<th>Learning time</th>
<th>Theory classes</th>
<th>Practical classes</th>
<th>Self study</th>
</tr>
</thead>
<tbody>
<tr>
<td>50h</td>
<td>20h</td>
<td>0h</td>
<td>30h</td>
</tr>
</tbody>
</table>

**Specific objectives:**

| Description:  |                |                   |            |
| Related activities: |            |                   |            |
7. Integral Calculus

**Learning time:** 42h
- Theory classes: 16h
- Practical classes: 0h
- Self study: 26h

**Description:**
Calculate change of variable primitives and parts. Calculation of integrals of rational functions. Rule Barrow.

1. Revision immediate calculation primitives. Change of variable and integration by parts.
2. Primitives rational functions.
3. Global defined as area. Barrow's rule.
4. Applications to the calculation of areas and volumes.

**Related activities:**

**Specific objectives:**

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**Qualification system**

**Regulations for carrying out activities**
Bibliography

Basic:


Complementary:


Gómez, Joan. Matemáticas, espías y piratas informáticos. RBA,

Others resources:

- http://www.geogebra.org
- http://www.calculusapplets.com/
- http://archives.math.utk.edu/visual.calculus/

Computer material

Geogebra

Resource