200002 - AL - Linear Algebra

Coordinating unit: 200 - FME - School of Mathematics and Statistics
Teaching unit: 749 - MAT - Department of Mathematics
Academic year: 2018
Degree: BACHELOR'S DEGREE IN MATHEMATICS (Syllabus 2009). (Teaching unit Compulsory)
ECTS credits: 7,5  Teaching languages: Catalan

Teaching staff

Coordinator: MARTA CASANELLAS RIUS

Others:
- Primer quadrimestre:
  - GUILLEM BLANCO FERNÁNDEZ - A, B
  - MARTA CASANELLAS RIUS - A, B
  - JULIO FERNÁNDEZ GONZÁLEZ - B
  - JORDI GUARDIA RUBIES - A
  - JAUME MARTI FARRE - A, B
  - ÓSCAR RIVERO SALGADO - A, B

- Segon quadrimestre:
  - MARTA CASANELLAS RIUS - REF
  - JAUME MARTI FARRE - REF

Degree competences to which the subject contributes

Specific:
1. CE-2. Solve problems in Mathematics, through basic calculation skills, taking into account tools availability and the constraints of time and resources.
2. CE-3. Have the knowledge of specific programming languages and software.
3. CE-4. Have the ability to use computational tools as an aid to mathematical processes.

Generical:
4. CB-1. Demonstrate knowledge and understanding in Mathematics that is founded upon and extends that typically associated with Bachelor's level, and that provides a basis for originality in developing and applying ideas, often within a research context.
5. CB-2. Know how to apply their mathematical knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader or multidisciplinary contexts related to Mathematics.
6. CB-3. Have the ability to integrate knowledge and handle complexity, and formulate judgements with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgements.
7. CG-1. Show knowledge and proficiency in the use of mathematical language.
8. CG-2. Construct rigorous proofs of some classical theorems in a variety of fields of Mathematics.
9. CG-3. Have the ability to define new mathematical objects in terms of others already know and ability to use these objects in different contexts.
10. CG-4. Translate into mathematical terms problems stated in non-mathematical language, and take advantage of this translation to solve them.
12. CG-6 Detect deficiencies in their own knowledge and pass them through critical reflection and choice of the best action to extend this knowledge.

**Transversal:**

11. SELF-DIRECTED LEARNING. Detecting gaps in one’s knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one’s knowledge.

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### Teaching methodology

(Section not available)

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### Learning objectives of the subject

(Section not available)

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### Study load

<table>
<thead>
<tr>
<th>Total learning time: 187h 30m</th>
<th>Hours large group: 45h 24.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h 0.00%</td>
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<td></td>
<td>Hours small group: 30h 16.00%</td>
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<tr>
<td></td>
<td>Guided activities: 7h 30m 4.00%</td>
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<tr>
<td></td>
<td>Self study: 105h 56.00%</td>
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# Content

## Matrices, determinant and linear systems

<table>
<thead>
<tr>
<th>Learning time: 25h</th>
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<tbody>
<tr>
<td>Theory classes: 6h</td>
</tr>
<tr>
<td>Practical classes: 4h</td>
</tr>
<tr>
<td>Self study: 15h</td>
</tr>
</tbody>
</table>

**Description:**

## Vector spaces

<table>
<thead>
<tr>
<th>Learning time: 37h 30m</th>
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<tbody>
<tr>
<td>Theory classes: 9h</td>
</tr>
<tr>
<td>Practical classes: 6h</td>
</tr>
<tr>
<td>Self study: 22h 30m</td>
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</tbody>
</table>

**Description:**

## Linear maps

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Theory classes: 6h</td>
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<td>Practical classes: 4h</td>
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<tr>
<td>Self study: 15h</td>
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**Description:**

## Diagonalization

<table>
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<td>Practical classes: 6h</td>
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<td>Self study: 22h 30m</td>
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**Description:**
200002 - AL - Linear Algebra

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<th>Ortogonalitat</th>
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<td>Theory classes: 9h</td>
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<td></td>
<td>Practical classes: 6h</td>
</tr>
<tr>
<td></td>
<td>Self study: 22h 30m</td>
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</tbody>
</table>

**Description:**

**Qualification system**

The subject is assessed by means of the continuous assessment and a final exam. The continuous assessment mark will be obtained from a not eliminatory midterm exam, similar to the final exam, and from qualifying some other activities carried out during the term.

The final mark of the subject will be worked out according to the formula:

Final Mark=\( \max\{\text{final exam mark}; 70\% \text{ final exam mark} + 25\% \text{ midterm exam mark} + 5\% \text{ other activities}\} \)

An extra exam will take place on July for students that failed during the regular semester.

**Bibliography**

**Basic:**

**Complementary:**

**Others resources:**