Course guides
200002 - AL - Linear Algebra

Unit in charge: School of Mathematics and Statistics
Teaching unit: 749 - MAT - Department of Mathematics.
Degree: BACHELOR’S DEGREE IN MATHEMATICS (Syllabus 2009). (Compulsory subject).
Academic year: 2020  ECTS Credits: 7.5  Languages: Catalan

LECTURER
Coordinating lecturer: MARTA CASANELLAS RIUS
Others:
Primer quadrimestre:
MARTA CASANELLAS RIUS - M-A, M-B
JESUS FERNANDEZ SANCHEZ - M-A
JORDI GUARDIA RUBIES - M-A, M-B
JAUME MARTÍ FARRÉ - M-A, M-B
PAU MIR GARCIA - M-B

Segon quadrimestre:
MARTA CASANELLAS RIUS - REF
JAUME MARTÍ FARRÉ - REF

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. CE-2. Solve problems in Mathematics, through basic calculation skills, taking in 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.

General:
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.
TEACHING METHODOLOGY

(Section not available)

LEARNING OBJECTIVES OF THE SUBJECT

(Section not available)

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Hours small group</td>
<td>30,0</td>
<td>16.00</td>
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<tr>
<td>Hours large group</td>
<td>45,0</td>
<td>24.00</td>
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<tr>
<td>Self study</td>
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<td>56.00</td>
</tr>
<tr>
<td>Guided activities</td>
<td>7,5</td>
<td>4.00</td>
</tr>
</tbody>
</table>

Total learning time: 187.5 h

CONTENTS

Matrices, determinant and linear systems

Description:

Full-or-part-time: 25h
Theory classes: 6h
Practical classes: 4h
Self study: 15h

Vector spaces

Description:

Full-or-part-time: 37h 30m
Theory classes: 9h
Practical classes: 6h
Self study: 22h 30m

Linear maps

Description:

Full-or-part-time: 25h
Theory classes: 6h
Practical classes: 4h
Self study: 15h
### Diagonalization

**Description:**

**Full-or-part-time:** 37h 30m
- Theory classes: 9h
- Practical classes: 6h
- Self study: 22h 30m

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### Orthogonalitat

**Description:**

**Full-or-part-time:** 37h 30m
- Theory classes: 9h
- Practical classes: 6h
- Self study: 22h 30m

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### GRADING 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 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:

\[
\text{Final Mark} = \max\{\text{final exam mark}; 60\% \text{ final exam mark} + 30\% \text{ midterm exam mark} + 10\% \text{ other activities}; 90\% \text{ final exam} + 10\% \text{ other activities}\}
\]

An extra exam will take place on July for students that failed during the regular semester and will substitute the total of the final mark.

### BIBLIOGRAPHY

**Basic:**
- Poole, David. Álgebra lineal: una introducción moderna. 2004.

**Complementary:**
- Lay, David C; Murrieta Murrieta, Jesús Elmer; Alfaro Pastor, Javier. Álgebra lineal y sus aplicaciones [on line]. 3a ed. act. México [etc.]: Pearson Educación, 2007 [Consultation: 23/06/2020]. Available on: