801901 - MATI - Mathematics I

Coordinating unit: 801 - EUNCET - Euncet University Business School
Teaching unit: 801 - EUNCET - Euncet University Business School
Academic year: 2014
ECTS credits: 6
Teaching languages: Catalan

Degree competences to which the subject contributes

Specific:
2. Using on an habitual basis the Information and Communication Technologies (ICT) in all its professional performance.
3. Applying to the analysis of problems, professional criteria based on the application of advanced techniques and tools.

Generical:
1. ANALYTICAL THINKING_N1. Being able to break down a topic or a problem and analyze the premises that form them, investigating in the relations between them and identifying their implications and consequences with the aim of judging their reliability.

Teaching methodology
Guided learning activities consist of, on the one hand, giving lectures in which professors make a brief explanation to introduce the general learning objectives related to the basic concepts of the course. Subsequently, by means of practical exercises and with the support of a mathematical software try to motivate and get the student involved for their active participation in the learning process.

Learning objectives of the subject
1. Understanding of fundamental concepts related to linear algebra, differential calculus and integral calculus.
2. Expressing statement problems by means of Venn diagrams and solve them with basic techniques of linear algebra.
3. Set and solve linear equation systems.
4. To draw a diagonal of a square matrix of Rank 3.
5. Calculate sequence limits and function limits.
6. Study the convergence of a numerical series and calculate the sum of some of them.
7. Interpret the graphic of a real function of real variable and sketch graphics of functions of a variable, manually and also with the help of computer programs.
8. Understanding the concept of derivative of a function in a point and being able to calculate derivatives of functions.
9. Applying the derivative to the study of local properties of functions.
10. Setting out and solving problems of optimization of functions.
## Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 0h 0.00%</th>
<th>Hours medium group: 56h 37.33%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours small group: 0h 0.00%</td>
<td>Guided activities: 0h 0.00%</td>
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<tr>
<td></td>
<td>Self study: 94h 62.67%</td>
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</tbody>
</table>
### Content

<table>
<thead>
<tr>
<th>Content title 1: Sets' theory</th>
<th>Learning time: 12h 30m</th>
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<tbody>
<tr>
<td></td>
<td>Practical classes: 4h</td>
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<tr>
<td></td>
<td>Guided activities: 3h</td>
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<tr>
<td></td>
<td>Self study : 5h 30m</td>
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**Description:**
1. Initial vocabulary.
2. Operations with sets of a universe.
3. The cardinals of finite sets.
4. The Euler function.
5. Examples of application of the sets' theory.

<table>
<thead>
<tr>
<th>Content title 2: Matrixes and linear equation systems</th>
<th>Learning time: 25h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Practical classes: 8h</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 6h</td>
</tr>
<tr>
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<td>Self study : 11h</td>
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**Description:**
1. Basic notions about matrixes.
2. Operations with matrixes.
3. The determinant of a square matrix.
4. The invert matrix of a square matrix.
5. Linear equation systems.

<table>
<thead>
<tr>
<th>Content title 3: Linear transformations and diagonalization</th>
<th>Learning time: 25h</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Practical classes: 8h</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 6h</td>
</tr>
<tr>
<td></td>
<td>Self study : 11h</td>
</tr>
</tbody>
</table>

**Description:**
1. Vectors.
2. Linear transformations
3. Diagonalization of matrixes.
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### Chapter 4: Sequences and series of real numbers

**Learning time:** 12h 30m  
- Practical classes: 4h  
- Guided activities: 3h  
- Self study: 5h 30m

**Description:**  
1. Solve problems in arithmetic progressions.  
2. Solve problems of geometric progressions.  
3. Calculate limits of sequences.

**Related activities:**  
The related activities are detailed in the "schedule of activities" published in the Athena platform for students to consult.

### (ENG) Mòdul 6. Combinatòria

**Learning time:** 25h  
- Practical classes: 8h  
- Guided activities: 6h  
- Self study: 11h

### (ENG) Mòdul 7. Matrius i sistemes d'equacions

**Learning time:** 25h  
- Practical classes: 8h  
- Guided activities: 6h  
- Self study: 11h

### Qualification system

Final exam (60%)  
Continuous assessment (40%)

The final grade for the course (FQ) is calculated from the following formula:

\[
FQ = 0.60 \times \text{Final Exam} + 0.40 \times \text{Continuous assessment mark}
\]

Minimum mark Final Exam 40 points out of 100

The course is passed with a FQ equal or above 50 out of 100

Generic skills are evaluated from the activities undertaken throughout the course and are considered passed if the student gets a score equal to or higher than 3 on the assessment rubric.
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**Regulations for carrying out activities**

A minimum mark of 40 out of 100 is required in the final exam to be able to average with the coursework mark, otherwise the final course mark will be a fail.

**Bibliography**

**Basic:**