200607 - MAT - Mathematics

Coordinating unit: 200 - FME - School of Mathematics and Statistics
Teaching unit: 749 - MAT - Department of Mathematics
Academic year: 2017
Degree: MASTER'S DEGREE IN STATISTICS AND OPERATIONS RESEARCH (Syllabus 2013). (Teaching unit Optional)
ECTS credits: 5  Teaching languages: Spanish, English

Teaching staff

Coordinator: MERCÈ MORA GINÉ
Others: Primer quadrimestre:
       MERCÈ MORA GINÉ - A
       VERA SACRISTAN ADINOLFI - A

Prior skills

The Mathematics course is a leveling course for students in Path 2 (students whose degree is neither mathematics nor statistics).
Students in Path 1 can not choose the Mathematics course.

Prior knowledge is not necessary.

Nevertheless, we encourage you to read the following sections of the book "Discrete Mathematics and Its Applications" (see the bibliography):
1.1 Propositional Logic
1.2 Applications of Propositional Logic
1.3 Propositional Equivalences
1.4 Predicates and Quantifiers
1.5 Nested Quantifiers
1.6 Rules of Inference
1.7 Introduction to Proofs
1.8 Proof Methods and Strategy
2.1 Sets
2.2 Set Operations
2.3 Functions
9.1 Relations and Their Properties
9.5 Equivalence Relations
9.6 Partial Orderings
(numbering refers to the 7th edition)

Language of instruction will be adapted to students.

Degree competences to which the subject contributes

Specific:
2. CE-2. Ability to master the proper terminology in a field that is necessary to apply statistical or operations research models and methods to solve real problems.

Transversal:
1. TEAMWORK: Being able to work in an interdisciplinary team, whether as a member or as a leader, with the aim of
To achieve, within a Statistics and Operations Research setting, a basic knowledge of the fundamental mathematical concepts that will qualify the student to reason in mathematical terms and comprehend the materials relevant to the specialty with an analytic capacity.

**Abilities to be acquired:**

The capacity to reason in mathematical terms, the capacity to analyze and comprehend the materials relevant to the specialty.

### Teaching methodology

It is adapted year to year to the background of mathematic knowledge and skills of those who enrol.

As general principles:
- Mathematical conceptual issues are collectively worked in class.
- Individual work of students includes at least solving problems, searching and analyzing additional documentation, reading and understanding mathematical texts.
- All individual work is subject to feedback from the professor.

### Learning objectives of the subject

To achieve, within a Statistics and Operations Research setting, a basic knowledge of the fundamental mathematical concepts that will qualify the student to reason in mathematical terms and comprehend the materials relevant to the specialty with an analytic capacity.

Abilities to be acquired:

The capacity to reason in mathematical terms, the capacity to analyze and comprehend the materials relevant to the specialty.

### Study load

<table>
<thead>
<tr>
<th>Total learning time: 125h</th>
<th>Hours large group: 30h</th>
<th>24.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group: 15h</td>
<td>12.00%</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Self study: 80h</td>
<td>64.00%</td>
</tr>
</tbody>
</table>

It is adapted year to year to the background of mathematic knowledge and skills of those who enrol.

As general principles:
- Mathematical conceptual issues are collectively worked in class.
- Individual work of students includes at least solving problems, searching and analyzing additional documentation, reading and understanding mathematical texts.
- All individual work is subject to feedback from the professor.

### Teaching methodology

It is adapted year to year to the background of mathematic knowledge and skills of those who enrol.

As general principles:
- Mathematical conceptual issues are collectively worked in class.
- Individual work of students includes at least solving problems, searching and analyzing additional documentation, reading and understanding mathematical texts.
- All individual work is subject to feedback from the professor.

### Learning objectives of the subject

To achieve, within a Statistics and Operations Research setting, a basic knowledge of the fundamental mathematical concepts that will qualify the student to reason in mathematical terms and comprehend the materials relevant to the specialty with an analytic capacity.

Abilities to be acquired:

The capacity to reason in mathematical terms, the capacity to analyze and comprehend the materials relevant to the specialty.

### Study load

<table>
<thead>
<tr>
<th>Total learning time: 125h</th>
<th>Hours large group: 30h</th>
<th>24.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group: 15h</td>
<td>12.00%</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Self study: 80h</td>
<td>64.00%</td>
</tr>
</tbody>
</table>
### Content

<table>
<thead>
<tr>
<th>Topic</th>
<th>Degree competences to which the content contributes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combinatorics</td>
<td></td>
</tr>
<tr>
<td>Linear Algebra</td>
<td></td>
</tr>
<tr>
<td>Metric Notions</td>
<td></td>
</tr>
<tr>
<td>The Concept of Function</td>
<td></td>
</tr>
<tr>
<td>The Concept of Limit</td>
<td></td>
</tr>
<tr>
<td>Infinite Sums</td>
<td></td>
</tr>
</tbody>
</table>

### Qualification system

Two elements will be taken into account:
- The comprehension of the basic concepts discussed in class (evaluated through a final exam).
- The individual work performed by each student (evaluating the results obtained through homework, presentations, participation, etc.)
Bibliography

Basic:


Others resources:

Hyperlink

http://www-ma2.upc.es/vera/teaching/courses/matematiques-mesio/
Web page for the course