200223 - MF - Financial Mathematics

Coordinating unit: 200 - FME - School of Mathematics and Statistics
Teaching unit: 749 - MAT - Department of Mathematics
Academic year: 2019
Degree: BACHELOR’S DEGREE IN MATHEMATICS (Syllabus 2009). (Teaching unit Optional)
ECTS credits: 6
Teaching languages: Catalan

Teaching staff

Coordinator: JOSEP JOAQUIM MASDEMONT SOLER
Others: Segon quadrimestre:
JOSEP JOAQUIM MASDEMONT SOLER - M-A
FRANCESC D’ASSIS PLANAS VILANOVA - M-A

Degree competences to which the subject contributes

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

5. Ability to solve problems from academic, technical, financial and social fields through mathematical methods.

Generical:
1. CB-4. Have the ability to communicate their conclusions, and the knowledge and rationale underpinning these to specialist and non-specialist audiences clearly and unambiguously.
2. To have developed those learning skills necessary to undertake further interdisciplinary studies with a high degree of autonomy in scientific disciplines in which Mathematics have a significant role.
6. CG-1. Show knowledge and proficiency in the use of mathematical language.

7. CG-2. Construct rigorous proofs of some classical theorems in a variety of fields of Mathematics.

8. 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.
9. CG-4. Translate into mathematical terms problems stated in non-mathematical language, and take advantage of this translation to solve them.
10. 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. EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
12. 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)
The aim of this course is to introduce students to mathematical methods for evaluating modern financial products. The course is composed of three parts: the first one is devoted to describing financial products and their evaluation using arbitrage, the second one provides the mathematical foundations for discrete processes, and finally the third part is devoted to continuous processes and concludes with an introduction to the Black-Scholes model.

There will be a partial exam, that will not carry exemption for the final exam. The final mark will be obtained by means of \( \max(0.4x \text{ (partial exam)} + 0.6 \times \text{ (final exam)}, \text{ final exam}) \).

### Learning objectives of the subject

The aim of this course is to introduce students to mathematical methods for evaluating modern financial products. The course is composed of three parts: the first one is devoted to describing financial products and their evaluation using arbitrage, the second one provides the mathematical foundations for discrete processes, and finally the third part is devoted to continuous processes and concludes with an introduction to the Black-Scholes model.

### Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 30h 20.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h 0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group: 30h 20.00%</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 0h 0.00%</td>
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<tr>
<td></td>
<td>Self study: 90h 60.00%</td>
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### Content

#### Financial Products and arbitrage

**Degree competences to which the content contributes:**

**Description:**


#### Discrete Models

**Degree competences to which the content contributes:**

**Description:**


#### Continuous Models

**Degree competences to which the content contributes:**

**Description:**

Bibliography

**Basic:**


**Complementary:**


