Course guides
200006 - CI - Integral Calculus

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, Spanish

LECTURER
Coordinating lecturer: ANDRES MARCOS ENCINAS BACHILLER

Others: Primer quadrimestre:
ANGELES CARMONA MEJIAS - CFIS, M-A, M-B
ANDRES MARCOS ENCINAS BACHILLER - CFIS, M-A, M-B
ÓSCAR RIVERO SALGADO - M-B

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>Self study</td>
<td>112.5</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>45.0</td>
<td>24.00</td>
</tr>
</tbody>
</table>

Total learning time: 187.5 h

CONTENTS

1. Improper Integrals and Numerical Series

Description:

Full-or-part-time: 37h
Theory classes: 6h
Practical classes: 6h
Self study : 25h

2. Multiple Integrals

Description:

Full-or-part-time: 60h 30m
Theory classes: 12h
Practical classes: 8h
Self study : 40h 30m

3. Line and Surface Integrals

Description:

Full-or-part-time: 24h
Theory classes: 5h
Practical classes: 3h
Self study : 16h
4. Integral Theorems

**Description:**
Gradient, Divergence and Curl. Green’s Theorem, Stokes’ Theorem and Gauss’ Theorem. Applications: conservative and solenoidal vector fields.

**Full-or-part-time:** 37h 30m
Theory classes: 7h 30m
Practical classes: 5h
Guided activities: 25h

5. Differential Forms

**Description:**

**Full-or-part-time:** 28h 30m
Theory classes: 6h 30m
Practical classes: 3h
Self study: 19h

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**GRADING SYSTEM**

A midterm exam (P) and a final exam (F).

The final course result will be calculated as follows:
Max {0.3 * P + 0.7 * F; F}

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

**BIBLIOGRAPHY**

**Basic:**

**Complementary:**