Universidad Zaragoza

Academic Year/course: 2024/25

27060 - Mathematical Analysis IV

Syllabus Information

Academic year: 2024/25
Subject: 27060 - Mathematical Analysis IV
Faculty / School: 100 - Facultad de Ciencias
Degree: 647 - Degree in Mathematics
ECTS: 7.5
Year: 2
Semester: Second semester
Subject type: Compulsory
Module:

1. General information

The object of this module is the integral calculus of functions of several variables, with attention to both the practical part and the theory. In particular: integration in R^n, change of variable and Fubini's theorem; integration of functions and 1-differential forms on paths; integration of functions and 2-differential forms on surfaces.

2. Learning results

- State and compute multiple integrals, line integrals and surface integrals.
- Know the applications to other fields the notions of partial derivatives and multiple, line, and surface integrals.
- Handle software to solve problems and give geometric interpretations to the notions involved in the course.

3. Syllabus

1. Integration in R^n. Differentiation under integral sign, change of variable and Fubini's theorem.
2. Integration of functions and 1-differential forms on paths. Poincaré's lemma.
3. Integration of functions and 2-differential forms on surfaces in R^3. Riemann-Green, Gauss-Ostrogradski and Stokes theorems.

4. Academic activities

Master classes: 51 hours.
Problem solving: 20 hours.
Computer classes: 4 hours.
Study: 105 hours.
Assessment tests: 7.5 hours.

5. Assessment system

There will be a global exam in each of the exam periods (may/june and june/july), on the day agreed by the Faculty of Sciences. In these exams there will be a theoretical part, which will provide a mark T_1 from 0 to 2 points. There will also be a practical part, which will provide a mark P from 0 to 8 points.

During the course there will be several short examinations. The dates and the contents covered in each short examination will be announced in advance. It is estimated that there will be two short examinations, although this number might change if the circumstances so require. The short examinations will provide a mark T_2 from 0 to 2 points.

The work carried out in the (mandatory) computer practices will also be evaluated. Alternatively, there will be a computer practical exam with a computer for those who did not pass this part in the practical computer sessions during the course.

The final grade will be C=max(T_1,T_2)+P.

In no case the students' right, according to present regulation, to pass the course by taking one final global exam will be violated.

6. Sustainable Development Goals

4 - Quality Education
5 - Gender Equality
8 - Decent Work and Economic Growth