

27057 - Mathematical Analysis II

Syllabus Information

Academic year: 2024/25

Subject: 27057 - Mathematical Analysis II

Faculty / School: 100 - Facultad de Ciencias

Degree: 647 - Degree in Mathematics

ECTS: 6.0

Year: 1

Semester: Second semester

Subject type: Basic Education

Module:

1. General information

The object of this module is the integral calculus of real functions of one real variable, with attention to both the practical part and the theory: series of real numbers; calculus of primitives, the Riemann integral and improper integrals; and power series.

2. Learning results

- Understand the idea of series of real numbers and know some convergence criteria, as well as some methods of summation.
- Understand the definition of the Riemann integral and the most relevant theorems of the integral calculus (Barrow's rule, fundamental theorem, integration by parts, changes of variable).
- Know some methods of calculus of primitives and some applications of the integral calculus.
- Understand the idea of improper integral and know some convergence criteria.
- Understand and handle the main properties of power series.
- Understand the importance of rigor in mathematics and the role of proofs and understand the epsilon-delta and similar arguments.

3. Syllabus

1. **Series of real numbers.** Series of non-negative terms. Convergence criteria. Series of any kind of terms. Methods to sum series.
2. **Integration.** Riemann's integral. Properties of the integral. Fundamental theorems of integral calculus. Applications of integral calculus. Improper integrals.
3. **Power series.** Convergence of power series. Differentiability and integrability of power series.

4. Academic activities

Master classes: 40 hours.
Problem solving: 16 hours.
Computer classes: 4 hours.
Study: 84 hours.
Assessment tests: 6 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. During the course there will be some 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 marks will have a total weight of 20 percent in the mark of the corresponding term.

The work carried out in computer practices will also be evaluated. 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.

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