

27021 - Lebesgue Integral

Syllabus Information

Academic year: 2023/24

Subject: 27021 - Lebesgue Integral

Faculty / School: 100 - Facultad de Ciencias

Degree: 453 - Degree in Mathematics

ECTS: 6.0

Year: 4

Semester: First semester

Subject type: Compulsory

Module:

1. General information

This subject's main objective is to introduce the student to the basic concepts of measure and integration theory in a general context, paying attention to the strength, beauty and elegance of the approximation results that appear in the theory of the Lebesgue integral, and providing the student with results and tools for solving problems in the field of measurability and integration.

The approaches and objectives of this module are aligned with the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda; the learning activities could contribute to some extent to the achievement of the goals 4 (quality education), 5 (gender equality), 8 (decent work and economic growth), and 10 (reducing inequality).

2. Learning results

- Know the fundamentals and basic techniques of the theory of measures and integration.
- Capture and deepen the intuitive idea of measuring sets.
- Relate the notion of measure with that of integration.
- Know and apply the theorems of monotone convergence, dominated convergence, Fatou's lemma, Fubini's theorem.

3. Syllabus

1. Measures.
2. Measurable functions. Integration with respect to a measure.
3. L^p spaces.
4. Decomposition of measures.
5. Radon-Nikodym and Lebesgue theorems.
6. Product measure. Fubini theorem.

4. Academic activities

Master classes: 45 hours.

Problem solving: 15 hours.

Study: 83 hours.

Assessment tests: 7 hours.

5. Assessment system

20% of the qualification will be obtained through the continuous evaluation of the theoretical subject through oral and/or written tests.

80% will be part of the final exam.

Without prejudice to the right that, according to current regulations, assists the student to present himself and, where appropriate, pass the subject by taking an overall test.