

27021 - Lebesgue Integral

Syllabus Information

Academic Year: 2022/23

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

1.1. Aims of the course

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (<https://www.un.org/sustainabledevelopment/es/>), in such a way that the acquisition of the learning outcomes of the module provides training and competence to contribute to some extent to their achievement: (4) Quality education, (5) Gender equality, (8) Decent work and economic growth, (9) Industry, innovation and infrastructure, (10) Reducing inequality, (17) Partnerships for the goals.

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, problem-solving sessions and tutorials.

4.2. Learning tasks

This course is organized as follows:

- **Lectures.** Theory contents will be explained. Learning material will be available in Moodle.
- **Problem-solving sessions.** These sessions serve to understand and apply the theoretical results. Blackboard will be used.
- **Tutorials.** Individual tutorial hours can take place at teachers' office hours.
- **Autonomous work and study.** Problem assignments for individual work.

More information and material is available in <http://anamat.unizar.es/docencia.html> and <https://moodle.unizar.es/>.

The teaching activities and assessment tasks will take place in a face-to-face mode, except in the case that, due to the health situation, the dispositions emitted by the competent authorities and by the University of Zaragoza compel to take them to a greater or lesser extent in a telematic form.

4.3. Syllabus

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

4.4. Course planning and calendar

Four weekly hours correspond to this course.

Further information concerning the timetable (<http://ciencias.unizar.es/web/horarios.do>), classroom, office hours, assessment dates and other details regarding this course (<http://anamat.unizar.es/docencia.html>) will be provided on the first day of class or please refer to the Faculty of Sciences website and Moodle (<https://moodle.unizar.es/>).

4.5. Bibliography and recommended resources

- Bartle, Robert G.: A modern theory of integration. GSM-32, Amer. Math. Soc. 2001.
- Bressoud, David, M.: A radical approach to Lebesgue's theory of integration. Cambridge 2008.
- Chae, Soo Bong: Lebesgue integration. Springer-Verlag 1995.
- Letac, Gérard: Integration and probability. Exercises and solutions. Springer-Verlag 1995.
- Tao, Terence: An introduction to measure theory. GSM-126, Amer. Math. Soc. 2011.

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=27021>