

27008 - General Topology

Syllabus Information

Academic Year: 2020/21

Subject: 27008 - General Topology

Faculty / School: 100 - Facultad de Ciencias

Degree: 453 - Degree in Mathematics

ECTS: 9.0

Year: 2

Semester: Annual

Subject Type: Compulsory

Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

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 autonomous work and study.

4.2.Learning tasks

This course is organized as follows:

- **Lectures**
- **Problem-solving sessions.** Participatory problem-solving sessions.
- **Autonomous work and study.**

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 in a telematic form.

4.3.Syllabus

This course will address the following topics:

- **Topic 1. Metric Spaces (I).**
 - Normed linear spaces.
 - Metric spaces.
 - Limit point, Derived and Closure set.
 - Open sets.
- **Topic 2. Topological Spaces.**
 - Topological spaces.
 - Bases and subbases.
 - Interior, derived set, closure and frontier.
- **Topic 3. Continuous Functions.**
 - Relative topology and subspaces.
 - Open and closed maps, homeomorphisms.
 - Product spaces.
 - Quotient spaces.
- **Topic 4. Separation and Countability.**
 - Hausdorff spaces.
 - Regular spaces.
 - Normal spaces.
 - Countability properties and related concepts.
- **Topic 5. Compactness.**
 - Compact spaces.
 - Locally compact spaces.
 - Alexandroff compactification.
 - Countably and sequentially compact spaces.
- **Topic 6. Metric Spaces (II).**
 - Compactness in metric spaces.
 - Complete metric spaces.
 - Completion of a metric space.
- **Topic 7. Connectedness.**
 - Connected spaces.
 - Locally connected spaces.
 - Pathwise connected spaces.
 - The homotopy relation.
- **Topic 8. Homogeneous Spaces.**
 - Topological groups.
 - Topological transformations groups.
 - Topology of linear groups.

4.4. Course planning and calendar

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

4.5. Bibliography and recommended resources

- Dugundji, James. Topology / James Dugundji Boston : Allyn and Bacon, 1966
- Higgins, P. J.. Introduction to topological groups / P. J. Higgins Cambridge : University Press, 1974
- Munkres, James R. Topología / James R. Munkres; traducción, Ángel Ferrández Izquierdo ... [et al.] . - 2ª ed. Madrid : Prentice Hall, D.L. 2001
- Willard, Stephen. General topology / Stephen Willard . - [1st. ed.] Reading, Massachusetts [etc.] : Addison-Wesley, cop. 1970

http://biblos.unizar.es/br/br_citas.php?codigo=27008&year=2020