Universidad Zaragoza

Academic Year/course: 2023/24

27101 - Mathematics

Syllabus Information

Academic year: 2023/24
Subject: 27101 - Mathematics
Faculty / School: 100 - Facultad de Ciencias
Degree: 446 - Degree in Biotechnology
ECTS: 9.0
Year: 1
Semester: Annual
Subject type: Basic Education
Module:

1. General information

The subject and its expected results respond to the following approaches and objectives:

This is a basic training subject within the Biotechnology Degree

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (https://www.un.org/sustainabledevelopment/es/), so that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement: Goal 4:Quality Education; Goal 5: Gender equality; Goal 8: Decent Work and Economic Growth; Goal 9:Industry, innovation and infrastructure; Goal 10: Reduction of inequalities; Goal 17: Alliances to achieve the objectives.

2. Learning results

In order to pass this subject, the students shall demonstrate they has acquired the following results:

Basic training in Mathematics at the level required for the study of Biotechnology.

3. Syllabus

1. **Sets of numbers.** Numbers and basic combinatorics.
2. **Differentiation in one variable.** Limits, continuity and derivability. Optimization.
3. **Linear and polynomial approximation.** Tangent line. Interpolation and Taylor polynomials.
4. **Integration in one variable.** Change of variable. Methods of calculating primitives. Definite integrals.
5. **Curves in parametric coordinates.** Notions of differential geometry of curves
6. **Linear algebra.** Matrices and systems of equations. Eigenvalues and eigenvectors.
7. **Ordinary differential equations and linear systems.** Linear equations and linear systems.
8. **Differentiation in several variables.** Directional derivatives. Tangent planes. Extremes.
9. **Integration in several variables.** Some applications of multiple integrals

4. Academic activities

Theory classes in the form of lectures. (5 ECTS)

Participative problem classes. (3 ECTS)

Computer practices in small groups. (1 ECTS)

Training support through documents and links on the subject page in the university's ADD, (Anillo digital docente) moodle.unizar.es (access restricted to registered students with the PIN and password provided by the University)

5. Assessment system

The student must demonstrate achievement of the intended learning results through the following assessment activities:

Completion of at least two theoretical-practical tests throughout the term (80% of the final grade between them).

There will be a midterm exam at the end of the first term, which will be used to eliminate subject matter. In case of not having passed the midterm exam or if students wish to improve their grade, they are entitled to the final exam. In any case, it will be necessary to pass both midterms separately.

Assessment of the student's learning by means of small tests (10% of the final grade).

Assessment of the student's participation in the computer practices (10% of the grade).

In addition to the assessment system indicated in the previous items, the student will have the possibility of being evaluated in a

global test, which will judge the achievement of the learning results indicated above

The syllabus that students should use to prepare for the different tests can be found in the "Syllabus" section of this teaching guide.