Universidad Zaragoza

Academic Year/course: 2023/24

28900 - Mathematics I

Syllabus Information

Academic year: 2023/24
Subject: 28900 - Mathematics I
Faculty / School: 201 - Escuela Politécnica Superior
Degree: 583 - Degree in Rural and Agri-Food Engineering
ECTS: 6.0
Year: 1
Semester: First semester
Subject type: Basic Education
Module:

1. General information

The aim of this subject is to provide mathematical tools that serve as a basis for building and/or studying certain mathematical models related to agri-food and rural concepts.

These approaches and objectives are aligned with the Sustainable Development Goals, SDGs, of the 2030 agenda (https://www.un.org/sustainabledevelopment/es/) and certain specific goals, contributing to some extent to their achievement.

Specifically:

- Goal 4: Quality Education.
- Target 4.4 By 2030, significantly increase the number of youth and adults who have the necessary skills, particularly technical and vocational, to access employment, decent work and entrepreneurship.

2. Learning results

The student, by passing this subject, achieves the acquisition of the basic knowledge of Calculus, Linear Algebra and Numerical Methods.

Interpret quantitatively and qualitatively the results obtained in the satisfactory resolution of certain problems related to agri-food and rural concepts.

These learning outcomes are aligned with Sustainable Development Goal 4, target 4.4, indicated in the objectives of the subject. With the achievement of these, students will have acquired the theoretical and practical knowledge necessary to be able to solve certain problems related to agri-food and ruralconcepts that require the use of mathematical techniques.

3. Syllabus

TOPIC 1. FUNCTIONS

TOPIC 2. DIFFERENTIAL CALCULUS

TOPIC 3. APPLICATIONS OF DERIVATIVES

TOPIC 4. MATRIX AND VECTOR SPACE THEORY

TOPIC 5. SYSTEMS OF LINEAR EQUATIONS. NUMERICAL APPLICATIONS

TOPIC 6. LEAST SQUARES AND INTERPOLATION

TOPIC 7. EIGENVALUES AND EIGENVECTORS. APPLICATIONS

4. Academic activities

Lectures: 30 hours

The topics of the program will be presented in class with the support of varied examples to facilitate the understanding of the subject.

Problem solving in the classroom: 30 hours

Application problems will be proposed based on the theoretical presentations. Some of them will be solved in the classroom leaving the rest for the student's non-classroom work.

Works: 27 hours

Several application problems related to the totality of the subject studied will be worked on. Such problems will be similar to those that will later be required in the written exams.

Study: 60 hours

Assessment: 3 hours

5. Assessment system

Students may use the continuous assessment method to pass the subject.

Students who opt for continuous assessment will have two types of tests. On the one hand, students must take two mandatory mid-term exams, from which a grade of 90% of the final grade will be obtained. On the other hand, will be used for exam-type problems that will account for a maximum of 10% of the final grade.

With the two midterms, a grade will be calculated as follows:

- 90% of the average grade of the midterm exams if a minimum of 3 out of 10 points has been obtained in each of them.

- The minimum between 90% of the average grade of the midterm and 3.9 if one of the following cases occurs:

a) A minimum of 3 points out of 10 has not been obtained in any of them.

b) 90% of the average grade of the mid-term exams does not reach 4.

Those students who have not passed the continuous assessment or who, having passed the subject, would like to raise their grade, will be able to take an exam of the whole subject on the official calls, on the date that the EPSH imposes for this purpose.

-In the last three years the success rates have been 80%, 77.42% and 58.14%