

39804 - Mathematics II

Syllabus Information

Academic year: 2023/24

Subject: 39804 - Mathematics II

Faculty / School: 326 - Escuela Universitaria Politécnica de Teruel

Degree: 634 - Joint Programme in Computer Engineering - Business Administration

ECTS: 6.0

Year: 1

Semester: First semester

Subject type: Basic Education

Module:

1. General information

The main objectives of this subject are:

- Identify, differentiate and use the basic knowledge about algebraic structures and linear algebra contained in the subject that will allow them to solve some mathematical problems of Computer Engineering.
- Solve problems with initiative, creativity and critical reasoning using appropriate mathematical language.
- Continuous learning and development of communication, autonomous and group learning skills.

The approaches and objectives of the course are aligned with the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda; specifically, the learning activities foreseen in this subject will contribute to some extent to the achievement of goals 4 (quality education), 5 (gender equality), 8 (decent work and economic growth) and 10 (reduction of inequalities).

2. Learning results

In order to pass this subject, students must:

Know the elementary algebraic structures.

Know and understand the basic concepts of linear algebra: systems of linear equations, vectors, linear dependence and independence, eigenvalues.

Know the approximate solution of linear equations, pivoting strategies, computational cost and various factorizations of matrices.

Know the iterative methods of approximate resolution of linear equations.

Know the approximate calculation of the eigenvalues of a matrix.

3. Syllabus

- Algebraic structures
- Finite bodies
- Matrix algebra
- Vector spaces
- Linear applications
- Eigenvalues and eigenvectors
- Orthogonality: approximate solution of systems of linear equations

4. Academic activities

1. Classroom lecture (Lecture + Problem solving)

The transmission of contents through the lecture, stimulating student participation, constitutes an important factor in the follow-up of this subject. The explanations on the blackboard, demonstrations, examples with the computer, etc., are intended to facilitate the learning process that students must follow to understand the subject.

In addition, the problems interspersed in the exposition of the theoretical concepts facilitate this understanding and provide the student with tools for a better understanding of the basic concepts of the subject and their application.

2. Practical classes

The practice sessions will be carried out with the computer in the computer rooms in small groups. They complement the applied aspects of the concepts in the lectures and are programmed by the center.

3. Problem solving for each program topic

The students, organized in groups, at the end of each topic of the program must solve and submit to the teacher a series of proposed problems.

4. Continued student study

In order to stimulate the student to carry out a continuous study of the subject, class participation will be encouraged and written tests will be given.

5. Tutorials

6. Examinations

The call of the global exam is fixed by the center before the beginning of the term. In addition, the professor of the subject will announce with sufficient advance notice other tests that can be graded in the continuous assessment modality.

5. Assessment system

Partial written test (20%, minimum grade 4.5): theoretical-practical questions, problems and practical exercises.

Academic Work (10%): Assignments with theoretical-practical exercises.

Computer practice (20%): Work developed during the practical sessions and final practical exam.

Final Exam (50%, minimum grade 4.5): Written test (in the 1st call) on the theoretical-practical contents of the subject, with exercises and questions of similar difficulty to those worked on in the term.