29905 - Mathematics II

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

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

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

Classroom sessions, to the whole group, combine participatory lectures and cooperative problem solving. Theoretical and practical material are available for student before the sessions, to increase their effectiveness.

The written exam, at mid-semester, is the first contact of students with the evaluation tests of the subject. It allows them to check their level of knowledge and also to get part of the final grade for the course.

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Tutored activities contribute to facilitate and improve students' learning, individually and in groups. The activities are of the following types: cooperative solving of specific problems, completion of questionnaires and tasks are offered in the Anillo Digital Docente (ADD) and developing of complementary topics. Students receive feedback and mentoring of teachers and peers, in person and through cooperative activities of ADD.

Practical sessions are held in computer room to delve into specific aspects of the subject by solving problems. Mathematical software and numerical methods are used where appropriate. Students have previously scripts of each session to encourage use during sessions.

It is important for students to study and perform continuous work from the first day of the course, as well as the convenience of using tutoring and cooperation sessions during the course.

5.2.Learning tasks

Classroom sessions: to the entire group, for 3 hours a week, to use magister participatory lecture and active methodologies for problem solving. There is no explicit separation between exposure of theoretical contents and problem solving.
Practical sessions: 6 sessions of 2 hours each, in computer laboratory. Mathematical software allows students to work with symbolic, numerical and graphical calculation, to facilitate understanding of the proposed learning results. Students of each academic group are divided into 3 subgroups at the beginning of the course.
Mid-term exam, in November, contains theory and problems of the topics taught so far.
Tutored activities are developed individually (questionnaires/ tasks) and through groups (teamwork/ forums), in face to face sessions and through the ADD. Teachers also perform the supervision and monitoring by these two ways.

5.3.Syllabus

LINEAR ALGEBRA

MATRICES AND LINEAR SYSTEMS : Properties of matrices and linear systems. Elementary matrices . Solving linear systems. VECTOR SPACES : Vector spaces . Vector subspaces. Suma directly.Linear dependence, generating systems and bases. Coordinates. Base changes. LINEAR APPLICATIONS : Applications and linear applications. Coordinate matrix. Kernel and Image. Equivalent matri ces and similar matrices. DIAGONALIZATION: Eigenvalues ​​and eigenvectors. Characteristic polynomial. Algebraic multiplicit y. Proper subspaces. G eometric multiplicity. Diagonalization of endomorphisms and matrices. GEOMETRY Euclidean geometry : Scalar product. Euclidean space. Norm, distance, angle. Orthogonality and orthonormality. Gram -Schmidt method. Orthogonal subspace. Orthogonal projection. Applications . Differential geome try: Curves in the plane and space. Frenet frame.

5.4.Course planning and calendar

The calendar and schedule of classroom sessions and laboratory practices are set by the center.
The calendar and schedule of the mid-term exam and the tutored activities is communicated to students through the ADD at the beginning of the course.

5.5.Bibliography and recommended resources

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