29905 - Mathematics II

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	435 - Bachelor's Degree in Chemical Engineering
ECTS	6.0
Course	1
Period	Half-yearly
Subject Type	Basic Education
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

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.

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 activities

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.Program

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.Planning and scheduling

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 recomended resources

BB	Arvesú Carballo, Jorge. Problemas resueltos de álgebra lineal / Jorge Arvesú Carballo, Francisco Marcellán Español, Jorge Sánchez Ruiz . - 1ª ed., 2ª reimp. Madrid : Thomson-Paraninfo, imp. 2006
BB	Hernández Rodríguez, Eugenio. Álgebra lineal y geometría / Eugenio Hernández Rodríguez, María Jesús Vázquez Gallo, María Ángeles Zurro Moro . - 3ª ed. Madrid : Pearson, D.L. 2012
BB	Merino González, Luis M. : Álgebra lineal :

29905 - Mathematics II

BB	con métodos elementales / Luis M. Merino González, Evangelina Santos Aláez . - 1ª ed., 4ª reimp. Madrid : Paraninfo, 2010 Rojo, Jesús. Algebra lineal / Jesús Rojo . - 2ª ed. Madrid [etc.] : McGraw-Hill Interamericana, D. L. 2007
BB	Rojo, Jesús. Ejercicios y problemas de algebra lineal / Jesús Rojo, Isabel Martín . - 2ª ed. Madrid [etc.] : McGraw-Hill, D.L. 2004
BB	Strang, Gilbert. Algebra lineal y sus aplicaciones / Gilbert Strang ; revisión técnica, Edmundo Palacios Pastrana . - 4ª ed. México D. F. : International Thomson, cop. 2007
BB	Villa, Agustín de la. Problemas de álgebra / Agustín de la Villa . - [4ª ed.] Madrid : CLAGSA, D.L. 2010