

Información del Plan Docente

Academic Year	2017/18
Faculty / School	175 - Escuela Universitaria Politécnica de La Almunia
Degree	424 - Bachelor's Degree in Mechatronic Engineering
ECTS	6.0
Year	1
Semester	Second semester
Subject Type	Basic Education
Module	---

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**

The learning process designed for this subject is based on the following:

Strong interaction between the teacher/student. This interaction is brought into being through a division of work and responsibilities between the students and the teacher. Nevertheless, it must be taken into account that, to a certain degree, students can set their learning pace based on their own needs and availability, following the guidelines set by the teacher.

Matemáticas II is conceived as a stand-alone combination of contents, yet organized into two fundamental and complementary forms, which are: the theoretical concepts of each teaching unit and the solving of problems or resolution of questions, at the same time supported by other activities.

5.2.Learning tasks

The programme offered to the student to help them achieve their target results is made up of the following activities...

Involves the active participation of the student, in a way that the results achieved in the learning process are developed, not taking away from those already set out, the activities are the following:

- **Face-to-face generic activities :**
 - o **Theory Classes** : The theoretical concepts of the subject are explained and illustrative examples are developed as support to the theory when necessary.
 - o **Practical Classes** : Problems and practical cases are carried out, complementary to the theoretical concepts studied.
 - o **Individual Tutorials** : Those carried out giving individual, personalized attention with a teacher from the department. Said tutorials may be in person or online.
- **Generic non-class activities:**
 - o Study and understanding of the theory taught in the lectures.
 - o Understanding and assimilation of the problems and practical cases solved in the practical classes.
 - o Preparation of seminars, solutions to proposed problems, etc.
 - o Preparation of summaries and reports.
 - o Preparation of the written tests for continuous assessment and final exams.

The subject has 6 ECTS credits, which represents 150 hours of student work in the subject during the semester, in other words, 10 hours (Lectures: 4 h.; Other Activities: 6 h.) per week for 15 weeks of class.

The overall distribution is:

- 52 hours of lectures, with 50% theoretical demonstration and 50% solving type problems.
- 8 hours of written assessment tests.
- 90 hours of personal study, divided up over the 15 weeks of the semester.

There is a tutorial calendar timetable set by the teacher that can be requested by the students who want a tutorial.

5.3.Syllabus

- 1.- Introduction to Octave.
- 2.- Systems of Linear Equations.
- 3.- Determinants.
- 4.- Numerical linear algebra.
- 5.- Vector Spaces.
- 6.- Orthogonality and Least Squares
- 7.- The Geometry of Vector Spaces.
- 8.- Diagonalization.
- 9.- Singular value decomposition.
- 10.- Multiple integrals: double integrals.
- 11.- Multiple integrals: change of variables; triple integrals.
- 12.- Plane and space curves: curvature and torsion.
- 13.- Line Integrals: the fundamental theorem for line integrals; Green's theorem.
- 14.- Surfaces: normal vector.
- 15.- Surface Integrals: Stokes' theorem, Gauss' theorem.

5.4.Course planning and calendar

A detailed schedule will be published in the Moodle page of the subject.

The dates of the final exams will be those that are officially published on the School website .

5.5.Bibliography and recommended resources

The updated bibliography at <http://psfunizar7.unizar.es/br13/eBuscar.php?tipo=a>

- Burgos Roman, Juan de. Algebra lineal y geometría cartesiana / Juan de Burgos Román . - 2ª ed. Madrid : McGrawHill, D.L. 1999
- Apostol, Tom M.. Calculus. Vol.1, Cálculo con funciones de una variable, con una introducción al álgebra lineal / Tom M. Apostol. - 2ª ed. reimp. Barcelona [etc.] : Reverté, cop. 2002
- Apostol, Tom M.. Calculus. Vol.2, Cálculo con funciones de varias variables y álgebra lineal, con aplicaciones a las ecuaciones diferenciales y a las probabilidades / Tom M. Apostol. - 2ª ed., 7ª reimp. Barcelona, [etc.] : Reverté, D.L. 2002
- Rojo, Jesús. Algebra lineal / Jesús Rojo . - 2ª ed. Madrid [etc.] : McGraw-Hill Interamericana, D. L. 2007
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- Allaire, Grégoire. Numerical Linear Algebra / Grégoire Allaire, Sidi Mahmoud Kaber. - 1ª edición New York: Springer-Verlag, 2008
- Quarteroni, Alfio. Cálculo científico con MATLAB y Octave / A. Quarteroni, F. Saleri Milano : Springer, cop. 2006
- Bradley, Gerald L.. Cálculo de varias variables / Gerald L. Bradley, Karl J. Smith ; traducción, José Luis Vicente Córdoba ; revisión técnica, Pedro Paúl Escolano Madrid [etc.] : Prentice Hall, D.L. 1998
- Matemáticas avanzadas para ingeniería / Glyn James ... [et al.] ; traducción, Elena de Oteyza de Oteyza, Carlos Hernández Garcíadiago ; revisión técnica, Juan Carlos del Valle, Juan Aguilar Pascual . - 2a ed. México [etc.] : Pearson Educación, 2002