

30706 - Mathematics 2

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	470 - Bachelor's Degree in Architecture Studies
ECTS	6.0
Course	1
Period	Second semester
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

Most of central ideas and topics are given by lectures to the whole group of students. They break up into small groups of 15 to 20 students for problem classes and computer classes. The problem classes allow students to work out hand-outs under the close assistance and guideline of the teacher. In addition, there are computer sessions every two weeks which allow to emphasize numerical aspects of the subject.

5.2.Learning activities

Lectures, computer classes, problem classes, group work

5.3.Program

Linear Algebra

1. Bilinear forms. Matrix representation, change of basis. Symmetric forms and their link with quadratics forms. Diagonalization of quadratics forms. Law of inertia, classification by rank and signature.
2. Inner products spaces, orthonormal sets. Gram-Schmidt orthogonalisation. QR factorization of rectangular matrices.

Differential and Integral Calculus in \mathbf{R}^n

1. Limits and continuity of real-valued functions defined on subsets of \mathbf{R}^n .
2. Partial and directional derivatives. Differentiability. The gradient. Higher-order derivatives. Local extrema. Vector-valued functions defined on subsets of \mathbf{R}^n . Differentiation, the Jacobian matrix. The chain rule.
3. Double and triple integrals. Change of variables.

Differential Geometry

1. Curves and smooth surfaces in \mathbf{R}^3 . Parameterised curves, arc length, curvature and torsion. Frenet-Serret frame. Parameterised surfaces in \mathbf{R}^3 . Area.
2. Line integrals. Surface integrals. Integration theorems.

5.4.Planning and scheduling

Schedules and classrooms for lectures, problem classes and computer classes may be found at <http://eina.unizar.es>

Scheduling of examinations is agreed by the School Board and are available at <http://eina.unizar.es>

Deadlines for intermediate examination and submission of group work will be announced in advance.

5.5.Bibliography and recommended resources

- Lay, David C.: Álgebra lineal y sus aplicaciones. México : Pearson Educación, 2007
- Salas, Saturnino L.: Calculus : una y varias variables / Salas, Hille, Etgen . 4ª ed. española, reimp. / actualización de la 4ª ed. española correspondiente a la 8ª ed. en inglés y revisión de la obra, Carles Casacuberta Vergés Barcelona : Reverté, D.L. 2005-2007
- Carmo, Manfredo P. do: Geometría diferencial de curvas y superficies. Madrid : Alianza Editorial, 1990
- Marsden, Jerrold E.: Cálculo vectorial . Jerrold E. Marsden, Anthony J. Tromba ; traducción Patricio Cifuentes Muñiz ... [et al.] ; revisión técnica Eugenio Hernández Rodríguez . 5ª ed., reimp. Madrid [etc.] : Addison-Wesley, 2005

