

Información del Plan Docente

Academic Year	2018/19
Subject	27006 - Calculus II
Faculty / School	100 - Facultad de Ciencias
Degree	453 - Degree in Mathematics
ECTS	15.0
Year	2
Semester	Annual
Subject Type	Compulsory
Module	---

1.General information**1.1.Aims of the course****1.2.Context and importance of this course in the degree****1.3.Recommendations to take this course****2.Learning goals****2.1.Competences****2.2.Learning goals****2.3.Importance of learning goals****3.Assessment (1st and 2nd call)****3.1.Assessment tasks (description of tasks, marking system and assessment criteria)****4.Methodology, learning tasks, syllabus and resources****4.1.Methodological overview**

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures and problem-solving sessions.

4.2.Learning tasks

This course is organized as follows:

- **Lectures.** Theoretical concepts and fundamental exercises are explained.
- **Problem-solving sessions.** Students practice and strengthen concepts and ideas which they have learnt.

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- o There will also be problem-solving sessions in which computers will be used in order to solve different types of exercises proposed in the course.

4.3.Syllabus

This course will address the following topics:

Functions of several variables

- **Topic 1.** Continuity and differentiability of real-valued and vector-valued functions. Functions of class C^p . Relative extrema.
- **Topic 2.** Implicit and inverse function theorems, change of variables. Manifolds and the Lagrange multipliers rule.
- **Topic 3.** Integration in \mathbb{R}^n (an approach to Lebesgue's method). Iterated integrals and differentiation under integral sign.
- **Topic 4.** Integration of functions and of 1-differential forms on paths. Poincaré's lemma.
- **Topic 5.** Integration of functions and differential forms on surfaces in \mathbb{R}^3 . Riemann-Green, divergence and Stokes theorems.

4.4.Course planning and calendar

There are six hours per week in first semester and four hour per week in the second one, following the official timetable given by the Faculty of Science in the University of Zaragoza.

In these hours there are included two hours per week in the first semester and one hour and a half in the second semester dedicated to solve exercises in the classroom.

Computer lessons take place in the second semester in fixed timetable.

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class or please refer to the Faculty of Sciences website and Moodle.

4.5.Bibliography and recommended resources

- Apostol, Tom M.. Análisis matemático / Tom M. Apostol . - 2a ed., [reimp.] Barcelona, [etc.] : Reverté, cop.1988
- Browder, Andrew. Mathematical analysis : an introduction / Andrew Browder New York [etc.] : Springer, cop. 1996
- Bombal Gordon, Fernando. Problemas de análisis matemático. Vol. 1, Espacios métricos y normados. El espacio \mathbb{R}^n / Bombal, Rodríguez, Vera . - [2a. ed. reimp.] Madrid : AC, D.L.1993
- Bombal Gordon, Fernando. Problemas de análisis matemático. Vol. 2, Cálculo diferencial / Bombal, R. Marín, Vera . - [1a. ed., reimp.] Madrid : AC, D.L. 1995
- Bombal Gordon, Fernando. Problemas de análisis matemático. Vol. 3, Cálculo integral / Bombal, R. Marín, Vera . - 1a ed., 2a reimp. Madrid : AC, 1994
- Demidovich, B.P.. 5000 problemas de análisis matemático / B. P. Demidóvich ; traducido del ruso por Emiliano Aparicio Bernardo . - 5ª ed. Madrid : Paraninfo, 1993
- Pastor, Eduardo. Teoría y problemas de cálculo integral / Eduardo Pastor, Victor Varela . - [1a. ed.] Madrid : Crisser, D.L. 1974
- Fleming, Wendell H.. Functions of several variables / Wendell Fleming . - 2nd. ed. New York, [etc.] : Springer-Verlag, 1977