

**Información del Plan Docente**

Academic Year	2017/18
Faculty / School	100 - Facultad de Ciencias
Degree	453 - Degree in Mathematics
ECTS	6.0
Year	4
Semester	First semester
Subject Type	Optional
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**

Methodology for the course:

- Lectures
- Problem sessions in small groups
- Office hours.
- Students' individual work.

## **5.2.Learning tasks**

At the end of each chapter there will be an exercise to prove the understanding of the contents and guarantee the learning process.

## **5.3.Syllabus**

### **Contents**

Differentiable manifolds.

The topology of a manifold . Partitions of the unity.

Differntiation on a manifold

Submanifolds

Quotient manifolds

Vector fields

Embedding theorems.

Transversality.

## **5.4.Course planning and calendar**

See the academic calendar of the Universidad de Zaragoza.

Dates for exercises will be announced in class and posted on the online platform Moodle.

The same will be done with the date, place and time of the final exam.

## **5.5.Bibliography and recommended resources**

Auslander,L - Mackenzie, R.E. Introduction to Differentiable Manifolds. Mc.Graw-Hill. 1963.

Boothby,W.M. An introduction to Differentiable Manifolds and Riemannian Geometry . Ac. Press. 1975.

Brickell,F.-Clark,R.S. . Differentiable Manifolds . Van Nostrand, 1970.

Burns, K - Gidea ,M . Differentiable Geometry and Topology. Chapman & Hall /CRC. 2005

Conlon,L. Differentiable Manifolds. A First Course. Birkhäuser , 1993

Gamboa J.M. - Ruiz J.M. Iniciación al estudio de las Variedades Diferenciables. Sanz y Torres 2016

Lee , J.M. Introduction to smooth manifolds. Springer-Verlag 2002.

Outerelo, E. - Ruiz, J.M - Rojo J.A. Topología Diferencial. Sanz y Torres 2014.

