

## 27041 - Differentiable Manifolds

### Información del Plan Docente

<b>Academic Year</b>	2016/17
<b>Academic center</b>	100 - Facultad de Ciencias
<b>Degree</b>	453 - Degree in Mathematics
<b>ECTS</b>	6.0
<b>Course</b>	4
<b>Period</b>	First semester
<b>Subject Type</b>	Optional
<b>Module</b>	---

### **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**

Methodology for the course:

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

#### **5.2.Learning activities**

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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.Program

#### Contents

Differentiable manifolds.

The topology of a manifold . Partitions of the unity.

Differentiation on a manifold

Submanifolds

Quotient manifolds

Vector fields

Embedding theorems.

Transversality.

### 5.4.Planning and scheduling

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.