

## Vector Calculus

Academic Year: ( 2020 / 2021 )

Review date: 05-02-2021

Department assigned to the subject: Mathematics Department

Coordinating teacher: MOLERA MOLERA, JUAN MANUEL

Type: Compulsory ECTS Credits : 6.0

Year : 1 Semester : 2

## REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Linear Algebra, Differential Calculus.

## OBJECTIVES

- Students have shown that they know and understand the mathematical language and abstract-rigorous reasoning as well as to apply them to state and prove precise results in several areas in mathematics.
- Students have shown that they understand the fundamental results from real, complex and functional mathematical analysis.

## DESCRIPTION OF CONTENTS: PROGRAMME

1. The Euclidean Space  $\mathbb{R}^n$ .
2. Functions.
3. Differentiability.
5. Extrema.
6. The implicit function theorem.
7. Curves.
8. Surfaces.

## LEARNING ACTIVITIES AND METHODOLOGY

**THEORY CLASS.** Classroom presentations by the teacher with IT and audiovisual support in which the main concepts of the subject are developed, while providing material and bibliography to complement student learning.

**PRACTICAL CLASS.** Resolution of practical cases and problem, posed by the teacher, and carried out individually or in a group.

**TUTORING SESSIONS.** Individualized attendance (individual tutoring sessions) or in-group (group tutoring sessions) for students with teacher as tutor.

## ASSESSMENT SYSTEM

- Tests (40%)

- Final exam (60%)

**% end-of-term-examination:** 60

**% of continuous assessment (assignments, laboratory, practicals...):** 40

## BASIC BIBLIOGRAPHY

- J. E. Marsden and A. J. Tromba Vector Calculus, 6th. edition, W. H. Freeman, 2012
- Manfredo P. Do Carmo Differential Geometry of Curves and Surfaces, Dover Publications; Updated, Revised (2nd) edition, 2016
- Seán Dineen Multivariate Calculus and Geometry, 3rd Edition, Springer, 2014
- Tom M. Apostol Mathematical Analysis, 2nd ed., Pearson Education, Inc., 1974

#### ADDITIONAL BIBLIOGRAPHY

- J. E. Marsden and M. J. Hoffman Elementary Classical Analysis, 2nd ed., W. H. Freeman and Company, 1974
- J. Stewart Calculus, Cengage, 2008
- M. D. Weir, J. Hass, and G. B. Thomas Thomas' Calculus 12th ed, Addison-Wesley , 2006
- M. J. Strauss, G. L. Bradley, and K. J. Smith Multivariable Calculus, Prentice Hall, 2002
- R. Larson and B. H. Edwards Calculus II, 9th. edition, Cengage, 2009
- S. Salas, E. Hille, and G. Etgen Calculus. One and several variables, Wiley, 2007
- T. M. Apostol Calculus, Wiley, 1975