30370 - Vector and differential Calculus

Información del Plan Docente

Academic Year	2018/19
Subject	30370 - Vector and differential Calculus
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	581 - Bachelor's Degree in Telecomunications Technology and Services Engineering
ECTS	6.0
Year	1
Semester	Second semester
Subject Type	Basic Education
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 learning process designed for this course is based on the following:

- Continuous work of the student: study of the theory content, review of the documentation made available for the student and lookup of the bibliography, solution of problems, exercises and questions on the subject.

- Lectures where the theoretical contents will be developed. They will be illustrated with examples and counterexamples for helping to understand them.

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- Laboratory sessions: students will solve problems and exercises with the help of a computer.

- Problems sessions where concepts and techniques presented in lectures will be further developed.

4.2.Learning tasks

The course is organized according to:

- Type I: Lectures (42 hours).

- Type II: Laboratory sessions (12 hours).

- Type III: Tutorial sessions of problems (6 hours).

Lectures: the teacher will explain the theoretical contents of the course and solve illustrative applied problems. These problems and exercises can be found in the problem set provided at the beginning of the semester. Lectures run for 3 weekly hours. Although it is not a mandatory activity, regular attendance is highly recommended.

Laboratory sessions: sessions will take place every 2 weeks (6 sessions in total) and last 2 hours each. Students will solve some problems by hand and/or using mathematical software.

Tutorial sessions of problems: Problems will be considered in order to help the understanding of the contents seen in lectures.

4.3.Syllabus

The course will address the following topics:

Theory sessions

1.- Interpolation and numerical integration.

2.- Scalar and vector fields, limits and continuity.

3.- Partial derivatives and differentiability

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4.- Double and triple integrals.

6.- Line integrals. Independence of the path.

7.- Surface integrals. Stokes' and Divergence theorem.

Laboratory sessions

S1.- Interpolation.

S2.- Interpolation with error stimation.

S3.- Simple and composite quadrature formulas.

S4.- Gaussian quadrature.

S5.- Line integrals.

S6.- Surface integrals.

4.4.Course planning and calendar

For further details concerning the timetable, classroom and further information regarding this course, please refer to the Escuela de Ingeniería y Arquitectura de la Universidad de Zaragoza, website, https://eina.unizar.es/ .

4.5.Bibliography and recommended resources