29600 - Mathematics I

Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	430 - Bachelor's Degree in Electrical Engineering
ECTS	6.0
Year	1
Semester	Half-yearly
Subject Type	Basic Education
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

The learning process is based on the following:

Master classes (theory and problems) (42 hours)
Practical sessions of computer (12 hours)

29600 - Mathematics I

Tutorials and exhibition of works in group (6 hours)
Preparation of works in group (14 hours)
Personal study of the student (73)
Realization of examinations and tests (3 hours)

To achieve that the students know the concepts of the course they will be needed theorical lectures, practical sessions and group works.

The auxiliary material for the course is available in the ADD.

5.2.Learning tasks

Classroom

They will be 3 hours a week into the classroom to complete a total of 42 hours. In these classes will be developed the theoretical contents and illustrative examples.

The contents of the course are divided into two main blocks: differential and integral calculus in one and several variables.

Practices with computer

They will be 6 practice sessions with computer 2 hours each. A mathematical software will be used to resolve them. The chosen software will allow the student work with calculation symbolic, numeric and graphic.

Students will have in advance a manual for each session that will contain the objectives, the theoretical contents and an explanation of the mathematical software commands used to solve the proposed problems.

Works in group

Several works must be made in groups of 3 or 4 people and will be guided with interviews/seminars with Professor.

5.3.Syllabus

29600 - Mathematics I

1. **Differential calculus in one variable:**
    1. Real and complex numbers.
    2. Differentiable functions.
    3. Polynomial approximation.
    4. Numerical methods.
2. **Integral calculus in one variable :**
    1. Techniques of integration.
    2. The definite integral.
    3. Applications of the integral.
    4. Numerical integration.
3. **Differential calculus in several variable :**
    1. Scalar and vector fields.
    2. The gradient vector.
    3. Tangent planes and linear approximation.
    4. Maximum and minimun of two variables functions.
4. **Multiple integrals:**
    1. Double integrals.
    2. Line integrals

5.4.Course planning and calendar

The presentation of works in group will be always before the start of the first semester exams. The dates of the meetings with the Professor will be detailed in class. This information will be available on ADD of the course.

The planning of the practical sessions with computer will be published at beginning of course.

5.5.Bibliography and recommended resources

[BB: Basic bibliography / BC: Complementary bibliography]

- [BB] Chapra, Steven C.. Métodos numéricos para ingenieros / Steven C. Chapra, Raymond P. Canale ; revisión técnica José Job Flores Godoy , Enrique Muñoz Díaz . - 7ª ed. México D. F. : McGraw-Hill/Interamericana, cop. 2015
- [BB] Curso práctico de cálculo y precálculo / Domingo Pestana...[et al.] Barcelona : Ariel, D.L. 2000
- [BB] Larson, Ron. Cálculo 1 / Ron Larson, Robert P. Hostetler, Bruce H. Edwards ; traductores, Sergio Antonio Durán Reyes ... [et al.] ; revisores técnicos, María del Carmen Hano Roa, José Job Flores Godoy, Lorenzo Abellanas Rapún. 8ª ed. México [etc.] : McGraw-Hill, cop. 2006
- [BB] Larson, Ron. Cálculo 2 de varias variables / Ron Larson, Bruce H. Edwards ; revisión técnica, Marlene Aguilar Abalo ... [et al.] ; [traducción: Joel Ibarra Escutia ... (et al.)] . 9ª ed. México [etc.] : McGraw Hill, cop. 2010
- [BB] Neuhauser, Claudia. Matemáticas para ciencias / Claudia Neuhauser; traducción , Ana Torres Suárez . - 2ª ed. Madrid [etc.] : Pearson Prentice Hall, D.L. 2004
- [BB] Rogawski, Jon. Cálculo : varias variables / Jon Rogawski ; versión española traducida por, Gloria García García ; revisado por, Martín Jimeno Jiménez . - 2ª ed. orig. Barcelona : Reverté, D.L. 2012
- [BB] Steiner, Erich. Matemáticas para las ciencias aplicadas / Erich Steiner Barcelona [etc.] : Reverté, D.L. 2005
- [BB] Stewart, James. Cálculo : conceptos y contextos / James Stewart ; [traducción, Joaquín Ramos Santalla] . - 3ª ed. México [etc.] : International Thomson Editores, cop. 2006
- [BB] Zill, Dennis G.. Cálculo con geometría analítica / Dennis G. Zill . México, D.F. : Grupo Editorial Iberoamérica, 1996
- [BC] Kreyszig, Erwin. Matemáticas avanzadas para ingeniería / Erwin Kreyszig . - 3a. ed. México : Limusa, cop. 2000
- [BC] Salas, Saturnino L.. Calculus / Saturnino L. Salas, Einar Hille . - 3a. ed. Barcelona [etc.] : Reverté, D.L. 1994
- [BC] Spivak, Michael. Calculus / Michael Spivak ; [versión española traducida por José María Oller Sala y Luis Serra Camó] . 3ª ed. (4ª ed. original), reimpr. Barcelona : Reverté, 2017
- [BC] Strang, Gilbert. Calculus / Gilbert Strang Wellesley, MA : Wellesley-Cambridge Press, cop.1991

Universidad Zaragoza

29600 - Mathematics I