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Checking date: 17/05/2019

Versión en español
(https://aplicaciones.uc3m.es
est=362&anio=2019&plan=43

Course: 2019/2020

Differential Calculus (18254)

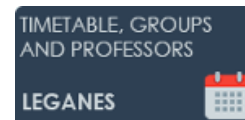**Study:** Bachelor in Applied Mathematics and Computing (362)

Coordinating teacher: ROMERA COLMENAREJO, ELENA

Department assigned to the subject: Department of Mathematics

Type: Basic Core   **ECTS Credits:** 6.0 ECTS

Course: 1º   **Semester:** 1º

Branch of knowledge: Engineering and Architecture

TIMETABLE, GROUPS AND PROFESSORS
LEGANES
(https://aplicaciones.uc3m.es/consultaHorarios/porAsignatura.htm?
ano=2019&centro=2&plan=433&asignatura=18254&idioma=en)

WEEKLY PLANNING
(http://www3.uc3m.es/reina/CRONOGRAMAS/Idioma_2/2019/362.18
time=1571949108784)

DOWNLOAD IN .PDF
(https://aplicaciones.uc3m.es/cpa/cpa/generaFichaPDF?
ano=2019&plan=433&asignatura=18254&idioma=2)

Students are expected to have completed
None

Competences and skills that will be acquired and learning results.   Further information on this link (http://portal.uc3m.es/portal/page/portal/titulaciones_grado/correlacion_materias)
Acquire and manage the mathematical language that allows understanding, formulate and solve problems that arise in computation and engineering. Get familiar with the functions of one real variable, their properties of continuity, derivability and graphic representation with their applications. Understand and be able to manage the formal language of demonstrations of the mathematical results. Manage sequences and series of real numbers and of functions, understanding the different kinds of convergence.

Description of contents: programme
1. Real variable functions 1.1 The real line: sets of numbers, properties, absolute values 1.2 Elementary functions and curves 1.3 Polar coordinates 2. Limits and continuity 2.1 Limits of functions. Properties and fundamental theorems 2.2 Continuity of functions. Fundamental theorems 2.3 Uniform continuity 3. Derivatives and their applications 3.1 Definition, properties, derivatives of elementary functions

3.2 Meaning of the derivative. Extrema

4 Local study of a function
4.1 Graphic representation
4.2 Taylor's polynomial and its applications

5. Sequences and series of real numbers
5.1 Sequences of numbers.
5.3 Series of positive numbers
5.4 Absolute and conditional convergence

6. Sequences and series of functions
6.1 Sequences of functions. Punctual and uniform convergence
6.2 Series of functions. Punctual and uniform convergence
6.3 Taylor series

Learning activities and methodology

1. MASTER CLASSES: Development of the theoretic part of the matter

2. PROBLEMS CLASSES: Resolution of problems and exercises in participatory classes

3. TUTORIES: Personal or group assessment for the students

4. SELFEVALUATIONS: Control of the evolution of the student

Assessment System

- % end-of-term-examination 60
- % of continuous assessment (assigments, laboratory, practicals...) 40

Basic Bibliography

- M. SPIVAK. Calculus. Cambridge University Press. Fourth edition, 2008

Additional Bibliography

- B.P. DEMMIDOVICH. Problemas y ejercicios de Anlálisis Matemático. Paraningo. 1980
- D. PESTANA, J.M. RODRÍGUEZ, E. ROMERA, E. TOURÍS, V. ÁLVAREZ, A. PORTILLA. Curso práctico de Cálculo y Precálculo. Ariel (Planeta). 2018
- G.L. BRADLEY, K.J. SMITH. Calculus . Pearson, 2012.
- S.L. SALAS, E. HILLE, G. ETGEN. Calculus one and several variables. Wyley. 10th edition, 2007
- T.M. APÓSTOL. Mathematical Analysis. Addison-Wesley. 1974

The course syllabus and the academic weekly planning may change due academic events or other reasons.