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Versión en español
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est=251&anio=2019&plan=42

Course: 2019/2020

Calculus II (15324)

Study: Bachelor in Aerospace Engineering (251)

Coordinating teacher: MOLINA MEYER, MARCELA

Department assigned to the subject: Department of Mathematics

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

Course: 1º **Semester:** 2º

Branch of knowledge: Engineering and Architecture

TIMETABLE, GROUPS AND PROFESSORS LEGANES
(https://aplicaciones.uc3m.es/consultaHorarios/porAsignatura.htm?ano=2019&centro=2&plan=421&asignatura=15324&idioma=en)

WEEKLY PLANNING
(http://www3.uc3m.es/reina/CRONOGRAMAS/Idioma_2/2019/251.15
time=1571949540260)

DOWNLOAD IN .PDF
(https://aplicaciones.uc3m.es/cpa/cpa/generaFichaPDF?ano=2019&plan=421&asignatura=15324&idioma=2)

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)

The aim of this course is to provide students the basic tools of differential and integral calculus of several variables. To achieve this goal students must acquire a range of expertise and capabilities.
SPECIFIC LEARNING OBJECTIVES (PO a):
- To understand the n-dimensional Euclidean space and in more depth n = 2 and 3.
- To know the properties of scalar and vector functions of several variables.
- To understand the concepts of continuity, differentiability and integrability.
- To be able to handle optimization problems using optimization techniques.
- To understand how to calculate double, triple, line and surface integrals.
- To know and apply the main theorems of vector calculus: Green, Gauss, Stokes.
- To understand how to apply the integral to calculate surface areas, volumes and solve some basic problems of Mathematical-Physics.
- To know what are linear ordinary differential equations and learn techniques for solving equations of first and second order.

SPECIFIC ABILITIES (PO a, k):
- To be able to work with functions of several variables given in terms of a graphical, numerical or analytical description.
- To understand the concept of differentiable function and ability to solve problems involving the concept.
- To understand the concept of multiple integral, line and surface integral and its practical applications.
- To understand what is an ordinary differential equation and know how to apply techniques of solving differential equations in different contexts.

GENERAL ABILITIES (PO a, g, k):
- To understand the necessity of abstract thinking and formal mathematical proofs.
- To acquire communicative skills in mathematics.
- To acquire the ability to model real-world situations mathematically, with the aim of solving practical problems.
- To improve problem-solving skills.
- To be able to use mathematical software in specific situations.

Description of contents: programme

1 .- The n-dimensional Euclidean space. Cartesian, polar, cylindrical and spherical coordinates.
2 .- Scalar and vector functions of several variables. Limits, continuity and differentiability.
3 .- Taylor's theorem. Optimization problems with and without constraints.
4 .- Double, triple, line and surface integral.
5 .- Theorems of Green, Gauss, Stokes and its applications .

Learning activities and methodology

Theory (3.0 credits. PO a).
Problem sessions working individually and in groups (3.0 credits. PO a).

Assessment System

We follow a continuous-assessment system plus a final exam:

- The continuous-assessment part consists in a written examination contributing with weight 40% to the final mark. The mid-term examination will take place, approximately, at two thirds of the semester and it will be held in regular class hours, according to the current regulations.

- The final exam (contributing with weight 60% to the final mark) will be held at the end of the semester. (PO: a.)

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

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