

SUBJECT TEACHING GUIDE

G37 - Mathematics III: Integra Calculus

Degree in Physics

Degree in Physics

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	Degree in Physics Degree in Physics			Type and Year	Core. Year 1 Core. Year 1
Faculty	Faculty of Sciences				
Discipline	Subject Area: Basic Mathematics for Science Basic Module				
Course unit title and code	G37 - Mathematics III: Integra Calculus				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Knowledge Field					
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. MATEMATICAS, ESTADISTICA Y COMPUTACION
Name of lecturer	BEATRIZ PORRAS POMARES
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Other lecturers	

4. OBJECTIVES

Within the context of the programs for bachelor degrees in Physics and in Mathematics, the subject Integral Calculus is an introduction to the main types of integrals used in classic applications of Infinitesimal Calculus. Its aims are: understanding the different types of situations where these integrals are used for modelling; getting a working knowledge of how integrals can be evaluated, as well as their main properties and their relationships among them; getting started in mathematical language and mathematical reasoning; and getting used to intellectual work.

6. SUBJECT PROGRAM	
CONTENTS	
1	1. Riemann integral for one real variable functions. Fundamental Theorem of Calculus. Computation of primitives. Improper integrals.
2	2. Integrals of functions of several real variables: Concept and fundamental properties. Riemann criteria. Iterated integrals. Fubini theorem. Integrals of functions defined over other bounded sets. Change of variables in double integrals. Change of variables in triple integrals. Some applications: mean value, center of gravity, ...
3	3.-Line Integrals: Smooth simple curves in the plane and space. Smooth piecewise simple curves. Closed curves. Curve length. Integral of a scalar field on a path. Integral of a vector field along a path. Green Theorem. Conservative fields. Smooth simple surfaces in parametric form. Oriented surfaces. Area of a surface. Integral of a scalar field over a surface Integral of a vector field across a surface. Stokes's and Gauss's Theorems

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Exam on the content of chapter 1	Written exam	No	Yes	30,00
Exam on the content of chapter 2	Written exam	No	Yes	30,00
Exam on the content of chapter 3	Written exam	No	Yes	30,00
Global problem on the content of the whole subject	Written exam	No	No	10,00
TOTAL				100,00
Observations				
Continuous evaluation (ordinary call): 1st Partial 2nd Partial + first partial recovery 3rd Partial + second partial recovery 4rd Global problem				
Extraordinary call: recovery of each of the partials				
Observations for part-time students				
The same evaluation type applies to part time students				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

M. Spivak, Calculus, Reverté

J.E. Marsden y A.J. Tromba, Cálculo vectorial (edición 3ª o posterior). Addison-Wesley.

Materiales docentes en el Aula Virtual