



IDENTIFYING DATA

Mathematics: Calculus II

Subject	Mathematics: Calculus II			
Code	V09G290V01204			
Study programme	(*)Grao en Enxeñaría da Enerxía			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	2nd
Teaching language	Spanish			
Department				
Coordinator	Álvarez Vázquez, Lino José			
Lecturers	Álvarez Vázquez, Lino José Martínez Varela, Áurea María			

3. Integral calculation of functions of several variables.	Double and triple integrals in elementary regions. Change of the order of integration. Change of variable. Polar coordinates. Cylindrical and spherical coordinates.
4. Ordinary differential equations.	Generalities on ordinary differential equations. Concept of solution. First order equations. Existence and uniqueness of solution. Autonomous equations. Equations in separate variables. Homogeneous equations. Exact equations. Linear equations. Families of curves: orthogonal trajectories.
5. Ordinary differential equations of upper order.	Differential equations of second order and upper order. Linear equations homogeneous and non-homogeneous. Linear equations with constant coefficients. Method of indeterminate coefficients. Method of variation of parameters. Equation of Cauchy-Euler.
6. Numerical methods for ordinary differential equations.	Methods for problems of initial value: methods of one step, methods multi-step, methods predictor-corrector. Methods for boundary problems: Methods of shot, methods of finite differences.
7. Introduction to the partial derivative equations.	Classification: elliptic, hyperbolic and parabolic equations. Problems with boundary values and problems of initial value. Examples: equation of Laplace, heat equation and wave equation.

Planning

	Class hours	Hours outside the classroom	Total hours
Master Session	30	60	90
Troubleshooting and / or exercises	10	20	30
Laboratory practises	5	8.75	13.75
Troubleshooting and / or exercises	5	8.75	13.75
Long answer tests and development	2.5	0	2.5

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

Troubleshooting and or exercises	The evaluation will be preferably continuous. The student, in the first weeks of kind, will deliver to the teaching staff of the subject a form to enrol in this type of evaluation. Once expressed his I wish to by writing of not taking part, no longer will be able to gave of high of the continuous evaluation. The continuous evaluation features of the proofs that detail the continuation and in the that the student will resolve, along the 10 practices of laboratory, problems and exercises of the are afraid indicate in the following points: * Four sessions of problems of an hour: First session: Subject 1 (practical of the week 2) Second session: Subject 3 (practical of the week 5) Third session: Subject 4 (practical of the week 7) Fourth session: Subject 5 (practical of the week 9) * Two sessions of laboratory of half hour: First session: Subject 2 (practical of the week 3) Second session: Subject 6 (practical of the week 10) These six proofs sum a 30% of the note having each a weight of a 5%. Learning outcomes: Comprise the basic bases of the theory of the integration of functions of an and several variables, and handle the elementary techniques of integration of ordinary differential equations.	30	C1 C7 C9	D4
Long answer tests and development	This proof is the final examination of the continuous evaluation, that will be done once finished the classes, with one weigh of 70% of the note, in the dates fixed by the School (what can be consulted in the page web of the Centre). Learning outcomes: Comprise the basic bases of the theory of the integration of functions of an and several variables, and handle the elementary techniques of integration of ordinary differential equations.	70	C1 C7 C9	D1 D4 D5 D10

Other comments on the Evaluation

Sources of information

J. Stewart, **Cálculo: Conceptos y contextos**, Thomson,
E. Marsden - A.J. Tromba, **Cálculo vectorial**, Pearson-Addison,
D.G. Zill - M.R. Cullen, **Matemáticas avanzadas para ingeniería: Ecuaciones diferenciales**, McGraw-Hill,