UNIVERSIDADE DA CORUÑA

Teaching Guide				
Identifying Data				2016/17
Subject (*)	Matemáticas 2		Code	610G01002
Study programme	Grao en Química			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	2nd four-month period	First	FB	6
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Matemáticas			
Coordinador	Otero Verea, Jose Luis	E-mail	luis.verea@udc.es	
Lecturers	Jacome Pumar, Maria Amalia Otero Verea, Jose Luis	E-mail	maria.amalia.jacome@udc.es luis.verea@udc.es	
Web				
General description	Esta asignatura pretende o desenvolvemento de competencias que permitan ó alumnado desenvolver un coñecemento crítico do calculo diferencial e integral de varias variables, ampliar os coñecementos en ecuacións diferenciais, así como una pequena introducción á estatística.			

Study programme competences / results	
Code	Study programme competences / results
A15	Ability to recognise and analyse new problems and develop solution strategies
A16	Ability to source, assess and apply technical bibliographical information and data relating to chemistry
A20	Ability to interpret data resulting from laboratory observation and measurement
A24	Ability to explain chemical processes and phenomena clearly and simply
A25	Ability to recognise and analyse link between chemistry and other disciplines, and presence of chemical processes in everyday life
A27	Ability to teach chemistry and related subjects at different academic levels
B1	Learning to learn
B2	Effective problem solving
B3	Application of logical, critical, creative thinking
B6	Ethical, responsible, civic-minded professionalism
C1	Ability to express oneself accurately in the official languages of Galicia (oral and in written)
C3	Ability to use basic information and communications technology (ICT) tools for professional purposes and learning throughout life
C6	Ability to assess critically the knowledge, technology and information available for problem solving

Learning outcomes			
Learning outcomes	Study programme competences / results		
The study, representation and interpretation of elementary functions of univariate and multivariate functions.	A15 A16 A20 A24 A25 A27	B1 B2 B3 B6	C1 C3 C6

Use skilfully the techniques of calculation of primitive and its applications.	A15 A16 A20 A24 A25 A27	B1 B2 B3 B6	C1 C3 C6
Set out and solve simple models that comport equations and systems of differential equations.	A15 A16 A20 A24 A25 A27	B1 B2 B3 B6	C1 C3 C6
Solve problems of basic statistical methods from the descriptive point of view	A15 A16 A20 A24 A25 A27	B1 B2 B3 B6	C1 C3 C6

Contents	
Topic	**Sub-topic**
? Functions of Several Variables.	o Graphs an Level Curves. o Polar Coordinates. Cylindrical and Spherical Coordinates. o Partial Derivatives. Differentiability and Gradient. o Directional Derivatives. Repeated Partial Derivatives. o The Chain Rule. The Jacobian Matrix. The Hessian. o Critical Points. Maxima and Minima. o Constrained Optimisation. Lagrange Multipliers. o Least Squares Analysis.
? Multiple Integrals.	o Repeated Integrals. Double Integrals. Triple Integrals. o Change of Variable in Multiple Integrals. o Curve Integrals. o Potential Function. o Green's Theorem. o Surface Integrals. o Stokes' Theorem.
? Ordinary Differential Equations.	o First Order Differential Equations. o Separable First Order Differential Equations. o Homogeneous equations. o Exact First Order Differential Equations. o Linear First Order Differential Equations. o Bernoulli Equations. o Applications of First Order Differential Equations. o Linear Differential Equations with Constant Coefficients. o The Method of Undetermined Coefficients. o Variation of Parameters. o Linear Systems with Constant Coefficients.
Descriptive Statistics	Univariate Descriptive Statistics Bivariate Descriptive Statistics Simple Linear Regression Analysis

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A15 A16 A24 A27 B1 B2 B3 B6	32	64	96
Problem solving	A20 A25 B2 B3 C1	8	18	26
Supervised projects	A15 A20 B1 B3 C1 C3 C6	8	16	24
Objective test	B2 B3	3	0	3
Personalized attention		1	0	1
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	Description
Guest lecture / keynote speech	Explanation of the contents and solution of problem from previous academic years.
Problem solving	Question lists and exams from other courses that will be regularly available about different contents and requested to be solved by the students.
Supervised projects	Supervised projects proposed by the teacher. They must include a theoretical abstract along with a list of solved problems on the corresponding issue.
Objective test	Exam guided to assess the knowledge of the theoretical contents explained in the keynote speeches.

Personalized attention	
Methodologies	Description
Supervised projects Guest lecture / keynote speech Problem solving	Personalized attention is designed as work of the student face to face with the teacher, so the student involvement is assumed. The way and moment of these meetings will be designated during the course according to the subject work plan.

Assessment			
Methodologies	Competencies / Results	Description	**Qualification**
Supervised projects	A15 A20 B1 B3 C1 C3 C6	Development of specific aspects with examples and solved problems. Competences A24, A27, B3 and C1 will be assessed.	10
Objective test	B2 B3	Development of questions and problems. Competencie C6 will be assessed.	70
Guest lecture / keynote speech	A15 A16 A24 A27 B1 B2 B3 B6	Questions to the students.	10
Problem solving	A20 A25 B2 B3 C1	Delivery of exercises and solved exams from previous courses. Competences A15, A16, A20, A25, B1, B2, B6 and C3 will be assessed.	10
Others			

Assessment comments

To surpass the asignatura will be necessary to obtain, added the qualifications of all the activities, a minimum note of 50% of the total. To obtain the qualification of no presented, sera sufficient that the student do not participate in the objective proof and have not been evaluated in the Works tutelados in but of 50%. In the proof of second opportunity the criterion to surpass the asignatura will be the previous or obtain a no inferior note to 50% in the objective proof. By what refers to successive academic courses, the process of education-learning, included the evaluation, refers to an academic course, and therefore volveria to begin with a new course, included all the activities and procedures of evaluation that went programmed for said course; nevertheless it allows request keep the qualification of practices of a previous course.
The students enrolled in regimen of partial time can be evaluated of personalised way regarding the methodologies of Session maxistral, Solution of problems and Works tutelados. The students enrolled in regimen of partial time is compulsory to present to the objective proof, asi as to the partial proofs along the course. For the first and second opportunity the criteria of evaluation for this alumnado, is the same that for the others and the percentage of dispenses of assistance will be of 80%.
The objective Proof is equal for all the students.
They have priority in the granting of matrícula of honour the students at the earliest opportunity.

Sources of information	
Basic	?Cálculo ?. Larson . Mcgraw-Hill?Cálculo varias variables ?. Jon Rogawski. Editotial Reverté ?Ecuaciones diferenciales con aplicaciones de modelado?. Zill. Thomson-Learning. CAO ABAD, R. y otros (2001). Introducción a la estadística y sus aplicaciones. Ed. Pirámide. MILLER, J.C. Y MILLER, J.N. (2002). Estadística para Química Analítica. Addison-Wesley Iberoamericana.TOMEO PERUCHA V. y UÑA JUÁREZ I. (2003). Lecciones de Estadística Descriptiva. Paraninfo.
Complementary	- (). . ?Cálculo I?. Alfonsa García. CLGSA ?Cálculo II?. Alfonsa García. CLGSA ?Problemas de funciones de varias variables ?. Alegre. PPU ?Ecuaciones diferenciales?. Rainville. Prentice Hall. ?Ecuaciones diferenciales?. Ayres. Mcgraw-Hill ?Cálculo ?. Bradley. Prentice Hall ?Cálculo ?. Finney. Addison-Wesley ?Cálculus ?. Salas / Hille / Etgen. Reverté GARCÍA ÁLVAREZ-COQUE, C. Y RAMIS RAMOS, G. (2001). Quimiometría. Editorial SíntesisGONICK, L. Y SMITH, W. (2001). A estatística ¡en caricaturas! SGAPEIO

Recommendations
Subjects that it is recommended to have taken before
Matemáticas 1/610G01001
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Other comments
It would be advisable to have knowledge of Matemáticas 1. As far as the block of Statistics is concerned, it is highly recommended the active involvement in the practicals and seminars.

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.