



Teaching Guide				
Identifying Data				2014/15
Subject (*)	Matemáticas 1	Code	610G01001	
Study programme	Grao en Química			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	First	FB	6
Language	Spanish			
Prerequisites				
Department	Matemáticas			
Coordinador	Otero Vereá, Jose Luis	E-mail	luis.verea@udc.es	
Lecturers	Ferreiro Ferreiro, Ana María Otero Vereá, Jose Luis	E-mail	ana.fferreiro@udc.es luis.verea@udc.es	
Web				
General description	esta asignatura pretende el desarrollo de competencias que permitan al alumnado desarrollar un conocimiento crítico del cálculo diferencial e integral así como una pequeña introducción al álgebra lineal y a las ecuaciones diferenciales			

Study programme competences	
Code	Study programme competences
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			
Subject competencies (Learning outcomes)	Study programme competences		
	O estudo, representación e interpretación de funcións elementais de unha e varias variables.	A15 A16 A20 A24 A25 A27	B1 B2 B3 B6
Utilizar con destreza as técnicas de cálculo de primitivas e as súas aplicacións.	A20 A24 A25 A27	B1 B2 B3 B6	C1 C3 C6
Resolver sistemas de ecuacións lineais e operar con cálculo matricial	A20 A24 A25 A27	B1 B2 B3 B6	C1 C3 C6



Plantexar e resolver modelos sinxelos que conleven ecuacións e sistemas de ecuacións diferenciais.	A20	B1	C1
	A24	B2	C3
	A25	B3	C6
	A27	B6	

Contents	
Topic	Sub-topic
? Differentiation	<ul style="list-style-type: none"> <li>o Basic Rules of Differentiation.</li> <li>o The Chain Rule.</li> <li>o Techniques Differentiation.</li> <li>o L'Hôpital's Rule. Taylor's Theorem.</li> <li>o Applications of Differentiation.</li> <li>o Maxima and Minima.</li> <li>o Optimisation Problems.</li> <li>o The Newton-Raphson Method.</li> </ul>
? Integration	<ul style="list-style-type: none"> <li>o Integration as Summation.</li> <li>o Fundamental Theorem of Calculus.</li> <li>o Some Basic Integrals.</li> <li>o Integration by Substitution.</li> <li>o Integration by Parts.</li> <li>o Integration of Rational Functions.</li> <li>o Geometrical Applications of Integration.</li> <li>o Numerical Integration. Simpson's Rule.</li> <li>o Improper Integrals.</li> </ul> <p>Integración numérica: método de Simpson. Integrales impropias.</p>
? Linear Algebra	<ul style="list-style-type: none"> <li>o Systems of Linear Equations</li> <li>o Elementary operations.</li> <li>o The Algebra of Matrices.</li> <li>o Determinants. Basic properties.</li> <li>o The determinant rank.</li> <li>o Eigenvalues and Eigenvectors.</li> <li>o Normal forms for matrices.</li> <li>o Cayley-Halmiton theorem.</li> </ul>
? Ordinary Differential Equations.	<ul style="list-style-type: none"> <li>o First Order Differential Equations.</li> <li>o Separable First Order Differential Equations.</li> <li>o Linear First Order Differential Equations.</li> <li>o Applications of First Order Differential Equations.</li> <li>o Second Order Linear Differential Equations with Constant Coefficients.</li> <li>o Homogeneous Linear Systems with Constant Coefficients.</li> </ul>

Planning			
Methodologies / tests	Ordinary class hours	Student's personal work hours	Total hours
Guest lecture / keynote speech	32	64	96
Problem solving	8	18	26
Supervised projects	8	16	24



Multiple-choice questions	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	desarrollo dos conceptos e resolución de problemas
Problem solving	Cuestionarios, boletins e exámenes de outros cursos que periódicamente ponderanse a disposición dos alumnos sobre distintos contidos e que o alumno terá que resolver.
Supervised projects	Traballo sobre temas propostos por o profesor, presentarase un resumo teórico xunto con un boletín de problemas resoltos acerca do tema correspondente
Multiple-choice questions	proba orientada a evaluación dos contidos teóricos que se traballan nas sesións maxistrais

Personalized attention	
Methodologies	Description
Guest lecture / keynote speech Supervised projects Problem solving	A atención personalizada que se describe en relación a estas metodoloxías concíbense como momentos de traballo presencial para o alumnado co profesor, po lo que implican unha participación obligatoria para o alumando.  A forma e o momento en que se desenvolverá indicárase en relación a cada actividade ao longo do curso según o plan de traballo da asignatura

Assessment		
Methodologies	Description	Qualification
Guest lecture / keynote speech	Questions to the students.	10
Multiple-choice questions	Test with 20 questions about Mathematics and 10 about Statistics, with 4 options, and for each 3 failed answers one correct answer will be eliminated. Competence C6 will be assessed.	70
Supervised projects	Development of specific aspects with examples and solved problems. Competence B3 will be assessed.	10
Problem solving	Delivery of exercises and solved exams. Competences A15, B2 and C3 will be assessed.	10

Assessment comments
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To pass the subject it is compulsory to obtain a final mark, after adding all the activities marks, at least 50% of the total qualification.

To get a NO SHOW mark, the student will not be able to attend the final multiple-choice questions exam.

The

guideline to pass the subject in July is the previous one, or to get a mark in the final multiple-choice exam not lower than 50%.

Regarding

following academic years, the teaching guides management, including the assessment, refers only to the ongoing academic year. Therefore, all the activities and assessment methodologies scheduled and planned for the following year will start from zero.

Supervised projects and problem solving of part-time students will be assessed in a personalized way.

## Sources of information

<b>Basic</b>	- LARSON (2006). CALCULO. McGrawHill
<b>Complementary</b>	- Bradley (). Cálculo. Prentice Hall - Finney (). Cálculo. Addison-Wesley - Alfonsa García (). Cálculo I. CLGSA - Salas / Hille / Etgen (). Cálculus. Reverté - NEUHAUSER (2004 ). MATEMÁTICAS PARA CIENCIAS . Pearson

## Recommendations

Subjects that it is recommended to have taken before

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

## Other comments

&nbsp; É conveniente ter coñecementos de matemáticas de 2 bacharelato,

si non os ten&nbsp; recomendase facer o curso de nivelación.&nbsp;

(\*)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.