



Teaching Guide

Teaching Guide				
Identifying Data				2015/16
Subject (*)	Matemáticas		Code	610G02003
Study programme	Grao en Bioloxía			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	First	FB	6
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Matemáticas			
Coordinador	Otero Verea, Jose LuisFerreiro Ferreiro, Ana María	E-mail	luis.verea@udc.esana.fferreiro@udc.es	
Lecturers	Calvo Garrido, María Del Carmen Ferreiro Ferreiro, Ana María García Rodríguez, José Antonio Otero Verea, Jose Luis Prieto Aneiros, Andrés	E-mail	carmen.calvo.garrido@udc.es ana.fferreiro@udc.es jose.garcia.rodriguez@udc.es luis.verea@udc.es andres.prieto@udc.es	
Web				
General description	esta asignatura pretende o desarrollo de competencias que permitan ao alumnado desenvolver un coñecemento crítico do cálculo diferencial e integral asi como unha pequena introducción ao alxebra lineal e as ecuacios diferenciais.			

Study programme competences

Code	Study programme competences
A21	Deseñar modelos de procesos biolóxicos.
B1	Aprender a aprender.
B2	Resolver problemas de forma efectiva.
B3	Aplicar un pensamento crítico, lóxico e creativo.
B4	Traballar de forma autónoma con iniciativa.
B5	Traballar en colaboración.
B6	Organizar e planificar o traballo.
B7	Comunicarse de maneira efectiva nunha contorna de traballo.
B8	Sintetizar a información.
B9	Formarse unha opinión propia.
B10	Exercer a crítica científica.
B12	Adaptarse a novas situacións.
B13	Comportarse con ética e responsabilidade social como cidadán e como profesional.

Learning outcomes

Learning outcomes	Study programme competences
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derivación e aplicacións da derivada	A21	B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B12 B13	
integración e aplicacións da integral	A21	B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B12 B13	
álgebra lineal e aplicacións	A21	B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B12 B13	
ecuacións diferenciais e aplicacións	A21	B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B12 B13	



Topic	Sub-topic
? Differentiation	- o Basic Rules of Differentiation. - o The Chain Rule. - o Techniques Differentiation. - o L'Hôpital's Rule. Taylor's Theorem. - o Applications of Differentiation. - o Maxima and Minima. - o Optimisation Problems. - o The Newton-Raphson Method.
? Integration	- o Integration as Summation. - o Fundamental Theorem of Calculus. - o Some Basic Integrals. - o Integration by Substitution. - o Integration by Parts. - o Integration of Rational Functions. - o Geometrical Applications of Integration. - o Numerical Integration. Simpson's Rule. - o Improper Integrals.
? Linear Algebra	- o Systems of Linear Equations - o Elementary operations. - o The Algebra of Matrices. - o Determinants. Basic properties. - o The determinant rank. - o Eigenvalues and Eigenvectors. - o Normal forms for matrices. - o Cayley-Hamilton theorem.
? Ordinary Differential Equations.	- o First Order Differential Equations. - o Separable First Order Differential Equations. - o Linear First Order Differential Equations. - o Applications of First Order Differential Equations. - o Second Order Linear Differential Equations with Constant Coefficients. - o Homogeneous Linear Systems with Constant Coefficients.

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student's personal work hours	Total hours
Guest lecture / keynote speech	A21 B2 B3 B6 B13	32	64	96
Problem solving	A21 B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B12	8	18	26
Supervised projects	A21 B1 B2 B3 B8 B9 B10 B12 B13	8	16	24
Multiple-choice questions	B1 B2 B3 B4 B8 B9 B10 B13	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	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.
Supervised projects	
Problem solving	
	A forma e o momento en que se desenvolverá indicarse en relación a cada actividade ao longo do curso según o plan de traballo da asignatura

Assessment			
Methodologies	Competencies	Description	Qualification
Guest lecture / keynote speech	A21 B2 B3 B6 B13	Questions to the students.	10
Multiple-choice questions	B1 B2 B3 B4 B8 B9 B10 B13	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. Competencie C6 will be assessed.	70
Supervised projects	A21 B1 B2 B3 B8 B9 B10 B12 B13	Development of specific aspects with examples and solved problems. Competence B3 will be assessed.	10
Problem solving	A21 B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B12	Delivery of exercises and solved exams. Competences A15, B2 and C3 will be assessed.	10

Assessment comments
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	
Basic	- LARSON (2006). CALCULO. McGrawHill
Complementary	- Alfonsa García (). Cálculo I. CLGSA - NEUHAUSER (2004). MATEMÁTICAS PARA CIENCIAS . Pearson - Bradley (). Cálculo. Prentice Hall - Salas / Hille / Etgen (). Cálculus. Reverté - Finney (). Cálculo. Addison-Wesley - Rogawski (2014). Cálculo, una variable. Editorial Reverté

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
É conveniente ter coñecementos de matemáticas de 2 bacharelato, si non os ten recomendase facer o curso de nivelación.

(*)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.