Universida_de_Vigo

IDENTIFYING DATA
Mathematics: Mathematics 2

Subject	Mathematics: Mathematics 2			
Code	V11G201V01108			
Study programme	(*)Grao en Química			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	Mirás Calvo, Miguel Ángel			
Lecturers	Mirás Calvo, Miguel Ángel Quinteiro Sandomingo, María del Carmen			
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General description	The subject is a basic introduction to the vector calculus, differential equations and statistics. It will be oriented to apply the mathematical models studied to concrete problems of the scientific field.			

Competencies

Code	
A2	Students can apply their knowledge and understanding in a manner that indicates a professional approach to their work or vocation, and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study
B4	Ability for analysis and synthesis
C21	Know mathematical concepts based on previous ones and be able to use them in the different contexts of Chemistry
D1	Ability to solve problems

Learning outcomes

Expected results from this subject	Training and Learning Results			
To use vector calculus to compute lengths of curves, areas of surfaces and the curl of a vector field.	A2	B4	C21	D1
To build and solve differential equation models of simple systems from physics or chemistry.	A2	B4	C21	D1
To compute probabilities associated to discreet and continuous random variables that follow well known probability distributions.	A2	B4	C21	D1
To use computer programs of calculation and graphic representation.		B4		D1

Contents

Topic	
Line and surface integrals	Curves and parametrizations Line integrals Parametric surfaces Surface integrals and flux integrals
Ordinary differential equations	Mathematical models and methods for solving first-order differential equations Linear models of higher order
Basic probability theory	Probability spaces Random variables

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	20	35	55

Practices through ICT	6	6	12
Problem solving	26	52	78
Essay questions exam	2	3	5

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

Methodologies

	Description
Lecturing	The teachers will present the theoretical foundations of the different topics; showing possible applications; formulating problems, questions and exercises; and proposing tasks and activities with orientations on the methods and techniques to employ to carry them out.
Practices through ICT	Activities oriented to learn how to handle computer programs for the calculation and graphic representation of functions and data.
Problem solving	The students, individually or in group, will have to solve the proposed problems and exercises. They will have to formulate the mathematical model more adapted to each situation and apply the corresponding technique to solve each case. They will also have to interpret and present the results.

Personalized assistance

Methodologies	Description
Lecturing	The doubts concerning the theoretical concepts presented in the classes will be attended in tutoring hours.
Problem solving	Each student can ask the teachers for extra explanations and to guidance concerning both the theoretical contents or the proposed tasks and exercises. These queries will be attended during the tutoring hours.
Practices through ICT	The doubts relative to the laboratory classes will be attended in the scheduled tutoring hours.

Assessment

	Description	Qualification	Training and Learning Results	
Problem solving	Tasks (that conform the so called continuous evaluation) in which each student will have to solve, individually or in group, applied problems or exercises. These assignments can be of distinct type: a written document, problem solving at chalkboard , oral presentation, puzzle, computer programs, partial examinations,...	20	A2	D1
Essay questions exam	Final examination. Individual exam that will take place right after the class period and that will include theoretical questions and exercises.	80	B4	C21

Other comments on the Evaluation

The final qualification of the subject (NF) will be compute by the formula:

NF=A+(10-A)E/10

where A is the continuous evaluation score (up to 2 points) and E is the final examination score (up to 10 points).

To pass the matter the final score has to be bigger or equal than 5 points (NF>=5). The students who fail to pass the matter at the earliest opportunity and want to do it in July, will have to repeat the final examination. The continuous evaluation score will be the same for the July evaluation..

The qualification NOT PRESENTED could not be given to a student who attended at least one of the final exams.

Sources of information

Basic Bibliography

Besada, M.; García, J.; Mirás, M.; Quinteiro, C.; Vázquez, C., **Un mar de Matemáticas. Matemáticas para os graos de Ciencias**, 1, Servicio de Publicacións Universidade de Vigo, 2016

Mirás Calvo, Miguel Ángel; Sánchez Rodríguez, María Estela **Técnicas estadísticas con hoja de cálculo y R: azar y variabilidad en las ciencias naturales**, 1, Servicio de Publicacións Universidade de Vigo, 2018

Adams, Robert A., **Cálculo**, 6, Addison Wesley, 2009

Simmons, George F., **Ecuaciones diferenciales: con aplicaciones y notas históricas**, 2, McGraw-Hill, 2002

Complementary Bibliography

Recommendations

Subjects that are recommended to be taken simultaneously

Physics: Physics 2/V11G201V01107
Geology: Geology/V11G201V01106
Chemistry: Chemistry Lab II/V11G201V01110
Chemistry: Chemistry 2/V11G201V01109

Subjects that it is recommended to have taken before

Biology: Biology/V11G201V01101
Physics: Physics I/V11G201V01102
Mathematics: Mathematics 1/V11G201V01103
Chemistry: Chemistry Lab I/V11G201V01105
Chemistry: Chemistry 1/V11G201V01104

Contingency plan

Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained
As many as possible according to the situation.

* Teaching methodologies modified
Those that, due to the situation, cannot be maintained as described in the teaching guide. In this case, to replace any type of presentation made in the classroom, both by the teacher and the students, virtual classrooms will be used as a complement to the resources offered by the faitic platform.

* Non-attendance mechanisms for student attention (tutoring)
The tutoring sessions may be carried out online under the modality of prior agreement.

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
The tests already carried out, related to "Problem solving and/or exercises", maintain their weight.

* Pending tests that are maintained
The "Problem solving and/or exercises" would take place online.
The ⬜Exam of development questions⬜, if the situation requires it, would be carried out electronically.

Depending on the moment in which the change in teaching took place, the pending "Problem solving and/or exercises" tests could increase its weight up to a maximum of 60% of the final grade. This increase would be detrimental to the weighting of the ⬜Examination of development questions⬜.