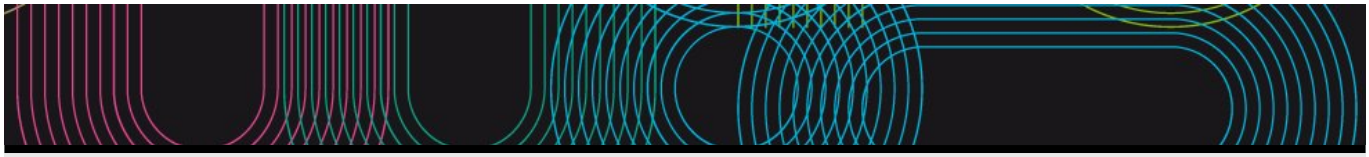
Universidade Vigo

Subject Guide 2023 / 2024



IDENTIFYING DATA				
Mathematics: Mathematics II				
Subject	Mathematics: Mathematics II			
Code	V10G061V01109			
Study programme	Grado en Ciencias del Mar			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	2nd
Teaching language	#EnglishFriendly Spanish Galician			
Department				
Coordinator	Hervés Estévez, Javier			
Lecturers	Hervés Estévez, Javier			
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Web	http://faitic.uvigo.es			
General description	Basic course of line and surface integrals and differential equations. English Friendly subject: International students may request from the teachers: a) resources and bibliographic references in English, b) tutoring sessions in English, c) exams and assessments in English.			

Training and Learning Results	
Code	
A5	Students have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy
C1	know at a general level the fundamental principles of sciences: Mathematics, Physics, Chemistry, Biology and Geology.
C2	Acquire basic knowledge of mathematics (differential and integral calculation) and statistics.
D2	Acquire the ability to learn autonomously, continuously and collaboratively, organizing and planning tasks over time.

Expected results from this subject	Training and Learning Results		
□ Understand the concepts of curl and divergence of a vector field. Understand the importance of line and surface integrals and how to use them in the study of the potential energy and other physical questions.	A5	C1 C2	D2
□ Formulate and solve first and second order differential equations.	A5	C1	D2
□ Use a computer program to solve problems related to integral calculus and differential equations.	A5	C1 C2	D2

Contents	
Topic	
Line integrals. Conservative fields.	Regular curves. Integral along a curve. Work done by a field. Conservative fields. Curl. Divergence.
Double integration. Surfaces.	Integration in rectangles. Integration in general areas. Change of variable. Polar coordinates. Green's Theorem. Parametric and regular surfaces. Orientation of a surface.
Surface integrals. Triple integration.	Flow rate. Stoke's theorem. Triple integrals. Spherical and cylindrical coordinates. Gauss' Theorem.
First order differential equations.	Solution of a differential equation. Separable equations. Exact equations. Linear equations.
Higher order linear differential equations.	N-order linear equations. Solutions.Second-Order Equations with Constant Coefficients. General solution to a homogeneous equation. Particular solution to a complete equation.

Laboratory topics	Integration and differential equations problem solving using computer software.

Planning			
	Class hours	Hours outside the classroom	Total hours
Lecturing	26	26	52
Seminars	18	18	36
Practices through ICT	4	2	6
Autonomous problem solving	0	10	10
Collaborative Learning	4	0	4
Essay questions exam	4	14	18
Problem and/or exercise solving	2	6	8
Problem and/or exercise solving	2	6	8
Problem and/or exercise solving	2	6	8

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

Methodologies	
	Description
Lecturing	Explanation of the theoretical basis and resolution of exercises and basic examples.
Seminars	Activities focused to individual work or in group to solve problems in order to expand and deepen the contents. They are used as a complement to the theoretical lectures.
Practices through ICT	Learning a computer program for calculation and graphic representation.
Autonomous problem solving	Students must solve problems using the methodology and information available and be able to interpret the results.
Collaborative Learning	Specific teamwork activities..

Personalized assistance	
Methodologies	**Description**
Seminars	Students will ask the professor about clarifications for a better understanding of the subject and successfully carry out the proposed tasks.
Practices through ICT	Students will ask the professor about clarifications for a better understanding of the subject and successfully carry out the proposed tasks.
Collaborative Learning	Students may attend office hours to ask for extra help or seek clarification of the material presented in class. It is necessary to contact the teacher in advance by e-mail to schedule an appointment.

Assessment					
	Description	Qualification	Training and Learning Results		
Practices through ICT	Students are required to solve some exercises with the software used in the laboratory sessions.	15	A5	C2	D2
Essay questions exam	At the end of the course there will be a final test with multiple choice questions, short answer questions and/or problems.	40	A5	C1 C2	D2
Problem and/or exercise solving	Oral presentation or written assignment in which the student must solve a series of problems under the conditions and time set by the teacher.	15	A5	C1 C2	D2
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Problem and/or exercise solving	Oral presentation or written assignment in which the student must solve a series of problems under the conditions and time set by the teacher.	15	A5	C1 C2	D2

Other comments on the Evaluation

The date, time and location of the final test will be published on the official website of the Faculty of Marine Sciences: http://mar.uvigo.es/alumnado/examenes/

The assessment system will select the best grade between the following:
a) the one obtained from the five previous items with their respective weights.
b) the one obtained in the final exam with a weight of 100%.
For this reason, the students of this subject will not have to choose between continuous or global assessment since the system selects the most convenient for them.

Students who do not pass the subject in the ordinary call, and intend to do so in the extraordinary call, will maintain the grades obtained during the course.
The students of the extraordinary "fin de carrera" call will be evaluated with an exam that will count 100% of the grade.
Students are required to take this course responsible and honest behavior. Any form of fraud (copying or plagiarism) aimed at falsifying the level of knowledge and skills achieved in all types of evidence, reports or work is considered inadmissible. Fraudulent conduct may mean failing the subject for a full course.

Sources of information

Basic Bibliography

Besada, M.; García Cutrín, J.; Mirás Calvo, M.A.; Quinteiro, C.; Vázquez, C., **Un mar de matemáticas**, Servizo de publicacións da Universidade de Vigo, 2016

Besada, M.; García Cutrín, J.; Mirás, M.; Quinteiro, C.; Vázquez, C., **Matlab: todo un mundo**, Servizo de publicacións da Universidade de Vigo, 2007

Larson, R.; Edwars, B., **Cálculo. Vol 1 e 2.**, 9º, McGraw-Hill, 2010

Adams, R., **Cálculo**, 6ª, Pearson, 2009

Complementary Bibliography

Besada, M.; García Cutrín, J.; Mirás Calvo, M.A.; Quinteiro, C.; Vázquez, C., **Matemáticas á Boloñesa**, Servizo de publicacións da Universidade de Vigo, 2014

Thomas, George B. Jr., **Cálculo, varias variables**, 12ª, Pearson, 2010

Campbel, S.; Haberman, R., **Introducción a las ecuaciones diferenciales**, McGraw-Hill, 1998

Bradley, G.; Smith, K., **Cálculo de varias variables (Volume 2)**, Prentice Hall, 1998

Recommendations

Subjects that it is recommended to have taken before

Mathematics: Mathematics I/V10G061V01104

Other comments

It recommends to had studied the subject of Mathematical II of the second course of high school.