Teaching Guide				
Identifying Data				2020/21
Subject (*)	Mathematics I [In extinction]		Code	670G01001
Study programme	Grao en Arquitectura Técnica			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	First	Basic training	6
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Matemáticas			
Coordinador	Benitez Garcia, Marta	E-mail	marta.benitez@udc.es	
Lecturers	Benitez Garcia, Marta	E-mail	marta.benitez@udc.es	
Web				
General description	Esta materia impártese no primeiro cuadrimestre do primeiro curso da titulación e forma parte dos 60 créditos básicos do título de Grao. É por iso unha materia de tipo xeral, na que se trata de proporcionar ao alumnado uns coñecementos básicos de matemáticas e da súa aplicación en carreiras técnicas. É validable en calquera outra carreira da rama científico-técnica.			
Contingency plan	1. Modifications to the contents 2. Methodologies *Teaching methodologies that are maintained *Teaching methodologies that are modified 3. Mechanisms for personalized attention to students 4. Modifications in the evaluation *Evaluation observations: 5. Modifications to the bibliography or webgraphy			

Study programme competences / results	
Code	Study programme competences / results
A1	Adquirir os coñecementos fundamentais sobre matemáticas, estatística, física, química e acústica como soporte para o desenvolvemento das habilidades e destrezas propias da titulación.
A2	Adquirir os coñecementos fundamentais sobre os sistemas e aplicacións informáticas específicos e xerais utilizados no ámbito da edificación.
A8	Deseñar, calcular e executar estruturas de edificación.
A9	Deseñar, calcular e executar instalacións de edificación.
A19	Aplicar as técnicas, interpretar resultados e tomar decisións para o control da calidade da obra.
B1	Capacidade de análise e síntese.
B2	Capacidade de organización e planificación.
B3	Capacidade para a procura, análise, selección, utilización e xestión da información.
B4	Coñecementos de informática relativos ao ámbito de estudo.
B5	Capacidade para a resolución de problemas.
B6	Capacidade para a toma de decisións.

B7	Capacidade de traballo en equipo.
B12	Razoamento crítico.
B14	Aprendizaxe autónomo.
B16	Capacidade de aplicar os coñecementos na práctica.
B25	Hábito de estudo e método de traballo.
B26	Capacidade de razoamento, discusión e exposición de ideas propias.
B27	Capacidade de comunicación a través da palabra e da imaxe.
B28	Capacidade de improvisación e adaptación para enfrontarse a novas situacións.
C1	Adequate oral and written expression in the official languages.
C3	Using ICT in working contexts and lifelong learning.
C4	Acting as a respectful citizen according to democratic cultures and human rights and with a gender perspective.
C5	Understanding the importance of entrepreneurial culture and the useful means for enterprising people.
C6	Acquiring skills for healthy lifestyles, and healthy habits and routines.
C7	Developing the ability to work in interdisciplinary or transdisciplinary teams in order to offer proposals that can contribute to a sustainable environmental, economic, political and social development.
C8	Valuing the importance of research, innovation and technological development for the socioeconomic and cultural progress of society.

Learning outcomes			
Learning outcomes	Study programme competences / results		
To consolidate student?s knowledge of calculus and cover gaps in relation to some basic contents, by encouraging the relationship between theory and practice.	A1	B1 B3 B5 B7 B16	C3 C6 C7 C8
To know and to connect the basic concepts and fundamental tools of calculus, and to be fluent in mathematical language appearing in the subject.	A1	B1 B5 B7 B12 B14	C3 C6 C7 C8
To get ability of thinking in an abstract way from the concrete, and to apply abstract results to concrete situations.	A1 A8 A9	B1 B3 B5 B27	C1 C3 C6 C7 C8
To know some mathematical models required for the formulation and solving of problems in construction sector.	A1 A8 A9 A19	B1 B3 B5 B6 B7	C3 C4 C6 C7 C8
To become aware that knowledge, skills and abilities achieved through the study of this subject are fundamental for academic career and future	A1 A8 A9	B1 B2 B3 B4 B5 B6 B7 B25 B26	C3 C4 C5 C6 C7 C8

To consolidate knowledge of statistics and probability.	A1 A8 A9	B1 B3 B4 B5 B6 B7	C1 C3 C4 C7 C8
To acquire fundamental knowledge of specific and general computer applications used in construction sector.	A2	B28	

Contents	
Topic	**Sub-topic**
SUBJECT 1.- FUNCTIONS OF ONE VARIABLE	1.1.- Definition and basic concepts. 1.2.- Limit of a function at a point. Properties. Operations. Infinite limits and limits at infinity. 1.3.- Continuity. Discontinuities. Properties of continuous functions. 1.4.- Derivative. Properties. Geometrical meaning. Chain rule. Taylor polynomial. 1.5.- Interpolation.
SUBJECT 5.- STATISTICS AND PROBABILITY	5-1 STATISTICS: 5-1.1 Statistics descriptive for one variable. 5-1.2 Previous concepts. Frequency tables. 5-1.3 Graphic representation. Characteristic measurement, position, dispersion 5-1.4 Statistics descriptive for several variables. 5-1.5 Bidimensional variable. Frecuency distribution. Graphic representation. Regression and correlation 5-2 PROBABILITY: 5-2.1 Probability. Random experiment. Sample space. Events. Probability definition. 5-2.2 Conditional probability. Independent events. Product and total probabilities rules. Bayes? theorem. 5-2.3 Probability distribution. Aleatory variable discrete and continuous. Expectation and variance. 5-2.4 Binomial distribution. Normal distribution 5-2.5 Introduction to statistical inference
SUBJECT 3.- INTEGRATION OF FUNCTIONS	3.1.- Concept of primitive. Properties. 3.2.- Methods of integration. Primitive calculus. 3.3.- Improper integrals. 34.- Geometrical applications. Areas, volumes, lengths. 3.5.- Numerical integration.
SUBJECT 4.- DIFFERENTIAL EQUATIONS. NUMERICAL METHODS.	4.1.- Definition and basic concepts. 4.2.- First order differential equations: separated variables, homogeneous, linear. 4.3.- Numerical methods: Euler, Runge-Kutta.
SUBJECT 2.- FUNCTIONS OF SEVERAL REAL VARIABLES	2.1.- Definitions and basic concepts. 2.2.- Limit. Properties. Operations. 2.3.- Continuity. 2.4.- Differentiation. Partial derivatives. Properties. 2.5.- Tangent plane and normal straight. 2.6.- Relative extremes with and without constrains. Lagrange multipliers method.
Attached: Computer programm MAXIMA	Problems may be solved assisted by the computer programm Maxima

Planning

Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Objective test	A1 A2 A8 A9 A19 B28 B27 B26 B25 B16 B14 B12 B7 B6 B5 B4 B3 B2 B1 C1 C3 C4 C5 C6 C7 C8	3	142	145
Personalized attention		5	0	5
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	Description
Objective test	Exame final que incluirá cuestións teórico-prácticas e exercicios prácticos.

Personalized attention	
Methodologies	Description
Objective test	A atención personalizada que se describe en relación con esta metodoloxía, concíbese como momentos de traballo presencial para o alumnado co profesor. En concreto, as máis relevanes, son as titorías individualizadas.

Assessment			
Methodologies	Competencies / Results	Description	**Qualification**
Objective test	A1 A2 A8 A9 A19 B28 B27 B26 B25 B16 B14 B12 B7 B6 B5 B4 B3 B2 B1 C1 C3 C4 C5 C6 C7 C8	Consistirá nunha proba escrita que incluirá cuestións teórico-prácticas e exercicios prácticos.	100

Assessment comments

Sources of information	
Basic	- Alfonsa García y otros (2007). CÁLCULO I . CLAGSA - Alfonsa García y otros (2002). Cálculo II. CLAGSA - Larson - Hostetler (1999). CÁLCULO Y GEOMETRÍA ANALÍTICA. Mc Graw Hill - Frank Ayres, Jr (2010). Cálculo (5ª edición). Mc-Graw-Hill - Burgos, Juan de (2008). Fundamentos matemáticos de la Ingeniería (Álgebra y Cálculo). Madrid: García-Maroto - García Merayo, Félix (1997). MÉTODOS NUMERICOS EN FORMA DE EJERCICIOS. Universidad Pontificia de Comillas

Complementary	- Burden, Richard L. (2011). Análisis Numérico. México: Cengage Learning - Simmons, George F. (1996). ECUACIONES DIFERENCIALES CON APLICACIONES Y NOTAS HISTÓRICAS. Madrid: McGraw-Hill - Adams, Robert A. (2009). CÁLCULO. Madrid:Prentice Hall - Bartoll Arnau, S. y otros (2009). FUNDAMENTOS MATEMÁTICOS EN ARQUITECTURA. Valencia: Editorial de la UPV - Ramos del Olmo-Rey Cabeza J.M. (2017). Matemáticas básicas para el acceso a la universidad. Ed. Pirámide - Miller, Irwin (2004). Probabilidad y estadística para Ingenieros. Barcelona: Reverté

Recommendations
Subjects that it is recommended to have taken before
Subjects that are recommended to be taken simultaneously
Mathematics II [In extinction]/670G01006
Subjects that continue the syllabus
Other comments
To study this subject, it is important that students have mathematical knowledge corresponding to the science area. To understand and pass other subjects in the career, it is positive to master this subject.