Teaching Guide				
Identifying Data				2021/22
Subject (*)	Structures II		Code	670G01025
Study programme	Grao en Arquitectura Técnica			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	Third	Obligatory	6
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Construcións e Estruturas Arquitectónicas, Civís e AeronáuticasEnxeñaría Civil			
Coordinador	Dominguez Diez, Eloy Rafael	E-mail	eloy.dominguez@udc.es	
Lecturers	Dominguez Diez, Eloy Rafael	E-mail	eloy.dominguez@udc.es	
Web	moodle.udc.es			
General description	Introducción a las estructuras de edificación. Acciones en la edificación Seguridad estructural. Estructuras de acero. Estructuras de madera. Estructuras de fábrica.			
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	
Code	Study programme competences
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.
A29	Elaborar estudos, certificados, ditames, documentos e informes técnicos.
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.
B8	Capacidade para traballar nun equipo de carácter interdisciplinario.
B16	Capacidade de aplicar os coñecementos na práctica.

B29	Actitude vital positiva fronte ás innovacións sociais e tecnolóxicas.
C1	Adequate oral and written expression in the official languages.
C3	Using ICT in working contexts and lifelong learning.
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		
Conocer y aplicar las acciones en el análisis de las estructuras de edificación.	A8 A29	B16	C3
To know and to understand the basic concepts and fundamentals of the structural security.	A2 A8 A29	B4 B5 B6 B8 B16 B29	C1 C3 C5 C6 C7 C8
Capacidad para realizar el análisis y comprobación de estructuras de edificación ejecutadas con acero.	A2 A8 A29	B1 B2 B3 B4 B5 B6 B8 B16 B29	C1 C3 C5 C6 C7 C8
Capacity to analyse and verify different timber structures in buildings. Solid timber, glulam timber.	A2 A8 A29	B4 B5 B6 B8 B16 B29	C1 C3 C5 C6 C7 C8
Capacity to analyse and verify masonry structures in buildings.	A2 A8 A29	B1 B2 B3 B4 B5 B6 B16	C1 C3 C5 C6 C8

Contents	
Topic	Sub-topic
INTRODUCTION TO STRUCTURES	Actions Structural safety Types of structures Structural representation

STEEL STRUCTURES	Calculus basis Modelling and classification Resistant verification of sections Measuring of structural elements
TIMBER STRUCTURES	Typologies Wood as a structural material Calculus criteria. Resistance Calculus criteria. Deflection
MASONRY STRUCTURES	Typologies Calculus basis Resistant verification in non reinforced masonry

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A8 B1 B4 B5 C1 C2 C3 C5 C6 C7 C8	30	30	60
Problem solving	A8 B2 B3 B8 B16 B29 C3 C6 C7	22	33	55
Supervised projects	A2 A8 A29 B3 B4 B6 B16 C1 C3 C5 C6 C7 C8	4	20	24
Mixed objective/subjective test	A8 B1 B2 B5 B6 B16 C1 C6	4	6	10
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	An important part of the in-person class will be developed basically through an expositive method. Nevertheless the student will be involved in the class during the development stage of the topic exposed, as far as it is possible. With this method the student will be given the chance to ask questions and to express his ideas, conducting the pupil to the learning process. Audio-visual and technological media will support the explanation.
Problem solving	Practical tests to verify the student knowledge are a significantly important part in this subject. Even though on their own practical tests do not conduct to the knowledge of the topics, they allow the consolidation and clarification of the concepts acquired in the previous master classes. The professor, by the students or in an intermediate way, could hold its resolution. For the students enrolled in the ?International Semester? this part of the subject will be evaluated through the guided work developed in the workshop based on a project methodology.
Supervised projects	The student will develop a variety of works during the course with the assistance of the professor. The students will have do and hand over the works in correspondence with the particular rules that will be established for each one of the proposed topics. For the students enrolled in the ?International Semester? this part of the subject will be evaluated through the guided work developed in the workshop based on a project methodology.
Mixed objective/subjective test	There will be written tests with the aim of evaluating the knowledge level and competences acquired by the student. For that purpose the tests will evaluate the theoretical contents comprehension and the practical skills acquired.

Personalized attention	
Methodologies	**Description**
Problem solving Guest lecture / keynote speech Mixed objective/subjective test Supervised projects	.

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Problem solving	A8 B2 B3 B8 B16 B29 C3 C6 C7	.	0
Mixed objective/subjective test	A8 B1 B2 B5 B6 B16 C1 C6	.	80
Supervised projects	A2 A8 A29 B3 B4 B6 B16 C1 C3 C5 C6 C7 C8	.	20

Assessment comments
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Sources of information	
Basic	- FIOL FEMENIA, FRANCISCO (2008). Acciones en la edificación : exposición y ejemplos de acuerdo con los documentos básicos SE y SE-AE. Burgos. - ARGUELLES ÁLVAREZ, RAMÓN (2005). Estructuras de acero. Madrid. Bellisco, 2ª ed. ampl. y act. - HURTADO MINGO, CONSTANTINO (2008). Estructuras de acero en la edificación. Madrid. APTA. - CUDÓS SAMBLANCAT, VICENTE (1988). Estructuras metálicas. Madrid. Escuela de la edificación - ENSIDESA (1977-1982). Prontuario ENSIDESA manual para cálculo de estructuras metálicas. Oviedo. Ensidesa - ARGÜELLES ÁLVAREZ, RAMÓN (2000). Estructuras de madera : diseño y cálculo. Madrid. AITIM - ADELL ARGILES, J.M. et alt (1992). El muro de ladrillo. Madrid. Hyspalit - CTE (2010). Código tecnico de la edificación. Ministerio de Fomento. codigotecnico.org - RODRÍGUEZ NEVADO, M.A. (1999). Diseño estructural en madera una aproximación en imágenes al estado del arte europeo a finales del siglo XX. Madrid. AITIM - FONBELLA GUILLÉN, R. (1994). Estructuras de ladrillo. Madrid: Fundación escuela de la edificación - MARTIN, L.H. et PURKISS, J.A. (2008). Structural design of steelwork to EN 1993 and EN 1994. Elsevier - GARDNER, l et NETHERCOT, D. A. (2011). Designers' guide to Eurocode 3: design of steel buildings: EN 1993-1-1, -1-3 and -1-8. Thomas Telford - PORTEOUS, J. et KERMANI, A. (2007). Structural timber design to Eurocode 5. Blackwell Pub. Co - LARSEN, H. and ENJILY, V. (2009). Practical design of timber structures to Eurocode 5. Thomas Telford - EUROCODES (1, 3, 5 AND 6) (). .

Complementary	- GORDON, J.E. (1999). Estructuras o por qué las cosas no se caen.. Madrid. Celeste - TORROJA, E. (1991). Razón y ser de los tipos estructurales. Madrid. Consejo Superior de Investigaciones Científicas I.E.T.C.C. - ITEA (2000). Programa Europeo de formación en cálculo y diseño de la construcción en acero. Guipuzcoa. ITEA - GÓMEZ SÁNCHEZ, I. (2006). Las estructuras de madera en los tratados de arquitectura (1500-1810). Madrid. AITIM - PEREZA SÁNCHEZ, J.E. (1994). Viviendas de madera. Madrid. AITIM - HERZOG, T.; NATTERER, J. (2005). Construire en bois. Laussane: Presses polytechniques et univeritaires normandes - NATTERER, J. et alli (1998). CONSTRUIRE EN BOIS (1) (2). Laussane: Presses polytechniques et univeritaires normandes - ESTÉVEZ, J.; MUÑIZ, S. (2007). Estructura de fábrica. A Coruña: Reprografía del Noroeste - DIESTE, E. (1987). La estructura cerámica. Bogotá: Escala - EAE (2011). Instrucción de acero estructural. Ministerio de la Presidencia

Recommendations
Subjects that it is recommended to have taken before
Mathematics I [In extinction]/670G01001 Applied Fhysics I [In extinction]/670G01002 Mathematics II [In extinction]/670G01006 Construction II [In extinction]/670G01011 Structures I [In extinction]/670G01019
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Structures III/670G01034
Other comments

(*)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.