Teaching Guide				
Identifying Data				2021/22
Subject (*)	Auxiliary and Security Equipment		Code	670G01026
Study programme	Grao en Arquitectura Técnica			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	2nd four-month period	Third	Obligatory	6
Language	SpanishGalicianEnglishItalian			
Teaching method	Face-to-face			
Prerequisites				
Department	Construcións e Estruturas Arquitectónicas, Civís e Aeronáuticas			
Coordinador	Fernandez Prado, Ruben	E-mail	ruben.fprado@udc.es	
Lecturers	Fernandez Prado, Ruben Porta Rodriguez, Manuel	E-mail	ruben.fprado@udc.es m.porta@udc.es	
Web				
General description	The objective of this subject is the knowledge of all those elements necessary to carry out the constructive process and, however, are not part of it. It highlights the work equipment, machinery, auxiliary and security. Their types and characteristics, use, mode of application or use and performance are studied, complementing the knowledge acquired in other subjects to make possible the executions in an optimal way. The official teaching guide is Spanish.			

Contingency plan	Contingency plan Two contingency plans have been designed. SCENARIO 1 A first scenario is proposed in which, due to the capacity of the classrooms or other types of reasons, it is not feasible to do face-to-face teaching in expository classes (master sessions), while interactive and workshop teaching, as they are smaller groups of students can continue to be taught in person. In this situation, the only change foreseen affects the teaching methodology used in the master sessions that will be held in online format with the help of the Teams platform included in Office365. There are no changes in the contents of the subject, nor in the mechanisms of personalized attention to the student, nor in the evaluation criteria. SCENARIO 2 A second scenario is proposed in which, in the event of possible confinement, any type of classroom teaching is not feasible. In such case, the planned changes are as follows: 1. Changes in content No changes are made 2. Methodologies * Teaching methodologies that are maintained None * Teaching methodologies that are modified Master session, problem solving, workshop, diagrams, mixed test. The impossibility of continuing to use both methodologies in face-to-face format requires the adoption of alternative strategies that facilitate learning regardless of possible contingencies related to the equipment and connection of the student body. Therefore, it is chosen to provide the necessary documentation through the Moodle platform to continue advancing in the training program, and the rest of the tasks are carried out with the help of the Teams platform included in Office365. 3. Mechanisms for personalized attention to students Moodle, virtual forum. The forum remains open throughout the school period, with teachers responding to possible queries both during virtual sessions and during official tutoring hours. Teams, virtual meetings and channels. Communication channels (general and by groups) are kept open so that the student can make inquiries. 4. Modifications in the evaluation To be developed online using Moodle or some other institutional tool that facilitates the electronic contribution of answers, images or other types of documents that allow assessing the level of competence acquired by the student in the subject. The student who passes the test via Moodle will take an oral test.

Study programme competences / results	
Code	Study programme competences / results
A3	Coñecer os materiais, tecnoloxías, equipos, sistemas e procesos construtivos propios da edificación en xeral e en particular aqueles específicos de Galicia.
A4	Coñecer as técnicas e procesos de restauración, rehabilitación, acondicionamento, patoloxía, mantemento e conservación dos edificios en xeral e en particular aqueles específicos do patrimonio cultural constituído pola arquitectura popular e histórica galega.

A5	Coñecer a evolución histórica dos materiais, tecnoloxías, procedementos, métodos, sistemas e elementos construtivos.
A16	Coñecer e aplicar as técnicas de avaliación e prevención de riscos, deseño de estudos e planes, así como dos procesos de coordinación da seguridade e saúde laboral na edificación.
A23	Implementar os planes de seguridade e o seu control en obra.
A25	Deseñar e redactar estudos e planes de evacuación e seguridade dos edificios.
B2	Capacidade de organización e planificación.
B6	Capacidade para a toma de decisións.
B7	Capacidade de traballo en equipo.
B13	Compromiso ético.
B16	Capacidade de aplicar os coñecementos na práctica.
B22	Sensibilidade cara a temas de seguridade laboral, accesibilidade, sustentabilidade e medioambiente.
B26	Capacidade de razoamento, discusión e exposición de ideas propias.
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		
Know the materials, technologies, equipment, systems and construction processes typical of the building in general and in particular those specific to Galicia.	A3 A4 A5		C4
Ability to apply knowledge in practice	A3 A16	B2 B6 B7 B16 B26	C1 C4 C7
Sensitivity to issues of work safety, accessibility, sustainability and the environment.	A16 A23 A25	B22	
Organization and planning capacity		B2 B6	C4 C6
Critically assess the knowledge, technology and information available to solve the problems they must face.		B22	C5 C8
capacity to solve problems		B2 B6 B13 B16	C3 C4 C7

Contents	
Topic	Sub-topic

BLOCK 1. SCAFFOLDING, SHORING AND DEMOLITIONS	SUBJECT 1.1. SCAFFOLDINGS SUBJECT 1.2. SHORINGS SUBJECT 1.3. MACHINERY AND HALF AUXILIARIES IN DEMOLISH And DEMOLITIONS SUBJECT 1.4. OCCUPATION OF PUBLIC ROAD SUBJECT 1.5. ROAD SIGNALING
BLOCK 2. ELEVATION	SUBJECT 2.1. PRINCIPLES OF ELEVATION. DEVICES. SUBJECT 2.2. MACHINERY OF ELEVATION SUBJECT 2.3. CRANE TOWER
BLOCK 3. EARTHWORKS	SUBJECT 3.1. THE TRACTOR SUBJECT 3.2. THE BULLDOZER SUBJECT 3.3. SCRAPER SUBJECT 3.4. GRADER SUBJECT 3.5. STANDARD STOCKPILES SUBJECT 3.6. EXCAVATORS, BACKHOES SUBJECT 3.7. Backhoe/Excavator Loaders SUBJECT 3.8. BIVALVE EXCAVATORS SUBJECT 3.9. COMPACTION AND CONSOLIDATION SUBJECT 3.10. PERFORMANCE EQUIPMENT EARTHWORKS . THE LAND. SUBJECT 3.11. POWER MACHINERY EARTHWORKS.
BLOCK 4. GENERAL INSTALLATIONS	SUBJECT 4.1. GENERAL INSTALLATIONS OF WORK. IMPLANTATION. SUBJECT 4.2. SECURITY IN THE MACHINES AND MAINTENANCE ITEM 4.3. THE BIM MODEL. PLANNING AND DEVELOPMENT OF ASSEMBLY OF EQUIPMENT.
BLOCK 5. MACHINERY AND HALF AUXILIARIES FOR STRUCTURES OF CONCRETE	SUBJECT 5.1. MACHINERY AND AUXILIARY MEDIA IN SPECIAL FOUNDATIONS SUBJECT 5.2. AUXILIARY MACHINERY AND MEANS FOR FOUNDATIONS AND CONCRETE STRUCTURES FEAR 5.3. SMALL MACHINERY AND AUXILIARIES

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A3 A4 A5 A16 B13 B22 C4 C5 C6	23	46	69
Objective test	A3 A4 A5 A16 A23	5	20	25
Supervised projects	A4 A16 A23 A25 B2 B6 B7 B13 B16 B22 B26 C1 C3 C6 C7 C8	23	23	46
Events academic / information	A3	2	6	8
Personalized attention		2	0	2
(*)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	Oral and graphic exhibition on blackboard and support of audiovisual media with specific insertion of invitation to the students to comments and debate to appreciate points of view and facilitate learning.
Objective test	Individual written test that integrates open questions of both theory and problem solving. In addition, with regard to objective questions, you can combine multiple-choice, ordering, short answer, discrimination, completion and / or association questions. The resolution of practical exercises may also be proposed.

Supervised projects	Practices will be carried out during the interactive sessions, complemented with the use of computer resources so that the student can solve in person the problems proposed by the teacher. There will be 4 types of projects: scaffolding project (plan), demolition project (application + traditional), shoring project and tower crane implementation project, as a team, which will begin in the interactive classes and will be completed at home, also as a team. The projects proposed by the professor will be presented publicly in the interactive sessions.
Events academic / information	There will be one or several outings to work or there will be an attendance to a conference that will be graded according to the attendance, the active participation of the student or the presentation of a work related to it.

Personalized attention	
Methodologies	**Description**
Events academic / information Objective test Guest lecture / keynote speech Supervised projects	In-office tutorials during the academic period of the course, at the request of the student or teacher. The personalized attention will not substitute in any case to the expository sessions or the interactive sessions exposed during the course, but it will serve as complement and support to the student in those matters in which, in spite of having made reasonable attempts to solve it, it does not reach assimilate the concept. The student must request a prior appointment for tutorials by mail.

Assessment			
Methodologies	**Competencies / Results**	**Description**	**Qualification**
Events academic / information	A3	The attendance will be essential, the active involvement of the student in the activity will be valued, and in his case, the teacher will be able to request a work about the subject matter for its qualification.	1
Objective test	A3 A4 A5 A16 A23	Individual written test that integrates open questions of both theory and problem solving. In addition, with regard to objective questions, you can combine multiple-choice, ordering, short answer, discrimination, completion and / or association questions. The resolution of practical exercises may also be proposed.	70
Guest lecture / keynote speech	A3 A4 A5 A16 B13 B22 C4 C5 C6	Oral and graphic exhibition on blackboard and support of audiovisual media with specific insertion of invitation to the students to comments and debate to appreciate points of view and facilitate learning. The minimum compulsory attendance will be 80% of the expository classes to qualify for the qualification.	2
Supervised projects	A4 A16 A23 A25 B2 B6 B7 B13 B16 B22 B26 C1 C3 C6 C7 C8	The 4 projects presented will be evaluated, both in their development part and the oral presentation of them in the interactive sessions.	27
Others			

Assessment comments

To pass the subject it is mandatory to obtain a grade of 5 out of 10 in the objective test, which will compute 70% of the final grade.

The grade obtained in the resolution of the proposed projects, delivered and defended in oral presentation during the interactive classes will constitute 27% of the final grade.

Active participation in the lectures will compute 2% of the final grade and conference attendance (or field trip) will compute 1% according to their use.

All students can attend the objective test (both on the first and second occasions), but only 30% obtained during the course will be maintained for students who have passed at least 80% of the problems proposed in interactive classes with an average rating higher than 5.
If the objective test has not been approved, the final grade of the subject will be that obtained in the same computation at 100%.

No objective evidence will be corrected that is not signed or all personal data are covered.

The student who does not attend the practical classes or does not perform the objective test will be qualified with "No Presented".

It is the teacher's authority to carry out substitutive partial tests of the objective test, under the conditions that he establishes.

Sources of information	
Basic	Eduardo Lagarde Abrisqueta (1988). EQUIPOS DE OBRAS Y MEDIOS AUXILIARES. Getafe (Madrid). Fundación Escuela de la Edificación Manuel Díaz del Río y Jáudenes (2007). MANUAL DE MAQUINARIA DE CONSTRUCCIÓN. Madrid. McGraw Hill Frank Harris (1992). MAQUINARIA Y MÉTODOS MODERNOS DE CONSTRUCCIÓN. Madrid. Bellisco e Hijos F. Ballester y J. Capote (1992). MÁQUINAS DE MOVIMIENTO DE TIERRAS. Madrid. PEDECA Andrés Abasolo (2005). CONSTRUCCIÓN Y MÁQUINAS EN EDIFICACIÓN. Madrid. Munilla-Leira, S.L. Félix Hernández Castellá y Luis Fernández Montes (1986). INTRODUCCIÓN A LA COMPACTACIÓN VIBRATORIA. Zaragoza. LEBRERO (varias firmas comerciales) (2004). OPERADOR DE GRÚA TORRE. Segovia. ATRIUM Luis Jiménez López (2002). OPERADOR DE GRÚAS TORRE. Barcelona. Grupo CEAC Miguel Ángel Menéndez González (2004). MANUAL PARA LA FORMACIÓN DE OPERADOR DE GRÚA TORRE. Valladolid. Fundación Laboral de la Construcción del Principado de Asturias y Lex Nova, S.A. SOCIEDAD FRANCO-ESPAÑOLA DE ALAMBRES, CABLES Y TRANSPORTES AÉREOS, S.A. (1965). CATÁLOGO DE LA SOCIEDAD FRANCO-ESPAÑOLA DE ALAMBRES, CABLES Y TRANSPORTES AÉREOS, S.A.. Bilbao E. Carnicer Royo (1981). EQUIPOS Y HERRAMIENTAS NEUMÁTICAS. Barcelona. Gustavo Gili Pierre Cormon (1979). FABRICACIÓN DEL HORMIGÓN. Barcelona. E.T.A. Juan Tiktin (1995). MOVIMIENTO DE TIERRAS. Madrid. Colegio de Ingenieros de Caminos, Canales y Puertos Campo Yagüe, José María del (2017). BULLDOZER: MAQUINARIA DE CONSTRUCCIÓN. Madrid: Ibergarceta Campo Yagüe, José María del (2017). CARGADORAS: MAQUINARIA DE CONSTRUCCIÓN. Madrid: garceta Campo Yagüe, José María del (2017). MAQUINARIA DE CONSTRUCCIÓN: MOTONIVELADORAS. Madrid: Garceta
Complementary	(revista especializada) ((edición mensual)). POTENCIA. (revista especializada) ((edición mensual)). CONSTRUCTION & EQUIPMENT.

Recommendations
Subjects that it is recommended to have taken before

Mathematics I [In extinction]/670G01001
Applied Fhysics I [In extinction]/670G01002
Materials I [In extinction]/670G01003
Mathematics II [In extinction]/670G01006
Applied Physics II [In extinction]/670G01007
Construction I [In extinction]/670G01009
Construction II [In extinction]/670G01011
Materials II [In extinction]/670G01012
Facilities I [In extinction]/670G01014
Construction III [In extinction]/670G01017
Geometry of Illustrations [In extinction]/670G01018
Structures I [In extinction]/670G01019
Topography [In extinction]/670G01020
Facilities II/670G01024
Structures II/670G01025
Structures III/670G01034
Subjects that are recommended to be taken simultaneously
Organisation, Programming and Control/670G01021
Construction IV/670G01022
Materials III [In extinction]/670G01016
Administration, Leadership and Management of Construction/670G01028
Structures III/670G01034
Facilities III/670G01035
Subjects that continue the syllabus
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.