



Teaching Guide

Teaching Guide				
Identifying Data				2022/23
Subject (*)	Auxiliary Equipment in Building		Code	670G01127
Study programme	Grao en Arquitectura Técnica			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	2nd four-month period	Third	Obligatory	6
Language	Spanish			
Teaching method	Non-attendance			
Prerequisites				
Department	Construcións e Estruturas Arquitectónicas, Cívís e Aeronáuticas			
Coordinador	Fernandez Prado, Ruben	E-mail	ruben.fprado@udc.es	
Lecturers	Fernandez Prado, Ruben Martínez García, Carolina Porta Rodriguez, Manuel	E-mail	ruben.fprado@udc.es carolina.martinezg@udc.es m.porta@udc.es	
Web				
General description	Conocimiento de aquellos elementos necesarios para llevar a cabo el proceso constructivo, de uso temporal pero que sin embargo no forman parte del edificio terminado. Maquinaria y equipos de obra para los distintos oficios y sistemas constructivos. Andamios, apuntalamientos y apeos. Sistemas de encofrados. Sistemas de elevación de cargas y personas. Maquinaria de movimiento de tierras. Organización de equipos, maquinaria e instalaciones generales de obra. A guía docente oficial é a de Español.			

Study programme competences

Code	Study programme competences
A56	A3.1 Ability to apply building rules and standards, and draw up technical specifications in relation to building methods and procedures.
A62	A4.1 Ability to plan and organise construction processes, equipment, and human and technical resources to carry out construction and maintenance work.
B31	B1 Students will demonstrate knowledge and understanding of subjects that build upon the foundation of a general secondary education using advanced textbooks and ideas and analyses from the cutting edge of their field.
B32	B2 Students will be able to use their knowledge professionally and will possess the skills required to formulate and defend arguments and solve problems within their area of study.
B33	B3 Students will have the ability to gather and interpret relevant data (especially within their field of study) in order to make decisions and reflect on social, scientific and ethical matters.
B34	B4 Students will be able to communicate information, ideas, problems and solutions to specialist and non-specialist audiences alike.
B35	B5 Students will develop the learning skills and autonomy they need to continue their studies at postgraduate level.
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.
C9	Ability to manage times and resources: developing plans, prioritizing activities, identifying critical points, establishing goals and accomplishing them.

Learning outcomes

Learning outcomes	Study programme competences
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Al finalizar con éxito esta asignatura, los estudiantes serán capaces de organizar, seleccionar, controlar e inspeccionar, conocer partes y características, proyectar, calcular, planificar y diseñar la implantación en obra, de los equipos, maquinaria y medios auxiliares necesarios para la ejecución de edificaciones. Realizar proyectos de implantación de grúa torre, de apeos y apuntalamientos, de demolición y planes de instalación de andamios.	A56	B31	C1
	A62	B32	C3
		B33	C4
		B34	C5
		B35	C6
			C7
			C8
			C9

Contents	
Topic	Sub-topic
BLOQUE 1. ANDAMIOS, APUNTALAMIENTOS Y DERRIBOS	TEMA 1.1. ANDAMIOS TEMA 1.2. APUNTALAMIENTOS TEMA 1.3. MAQUINARIA Y MEDIOS AUXILIARES EN DERRIBO Y DEMOLICIONES TEMA 1.4. OCUPACIÓN DA VÍA PÚBLICA TEMA 1.5. SEÑALIZACIÓN VIARIA
BLOQUE 2. ELEVACIÓN	TEMA 2.1. PRINCIPIOS DE ELEVACIÓN. APARATOS. TEMA 2.2. MAQUINARIA DE ELEVACIÓN TEMA 2.3. GRÚA TORRE
BLOQUE 3. MOVIMIENTO DE TIERRAS	TEMA 3.1. EL TRACTOR TEMA 3.2. EL BULLDOZER TEMA 3.3. MOTOTRAILLA TEMA 3.4. MOTONIVELADORA TEMA 3.5. CARGADORAS TEMA 3.6. EXCAVADORAS, RETROEXCAVADORAS TEMA 3.7. PALA MIXTA TEMA 3.8. EXCAVADORA DE MANDÍBULAS TEMA 3.9. COMPACTACIÓN Y CONSOLIDACIÓN TEMA 3.10. RENDIMIENTO DE MAQUINARIA DE MOVIMIENTO DE TIERRAS. EL TERRENO. TEMA 3.11. POTENCIA EN LA MAQUINARIA DE MOVIMIENTO DE TIERRAS.
BLOQUE 4. INSTALACIONES GENERALES	TEMA 4.1. INSTALACIONES GENERALES DE OBRA. IMPLANTACIÓN. TEMA 4.2. SEGURIDAD EN LAS MÁQUINAS Y MANTENIMIENTO TEMA 4.3. EL MODELO BIM. PLANIFICACIÓN Y DESARROLLO DE MONTAJE DE EQUIPOS.
BLOQUE 5. MAQUINARIA Y MEDIOS AUXILIARES PARA ESTRUCTURAS DE HORMIGÓN	TEMA 5.1. MAQUINARIA Y MEDIOS AUXILIARES EN CIMENTACIONES ESPECIALES TEMA 5.2. MAQUINARIA E MEDIOS AUXILIARES PARA CIMENTACIONES Y ESTRUCTURAS DE HORMIGÓN TEMA 5.3. PEQUEÑA MAQUINARIA Y AUXILIARES

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A56 A62 B31 B32 B33 B34 B35 C1 C3 C4 C5 C6 C7 C8 C9	23	46	69



Supervised projects	A56 A62 B31 B32 B33 B34 B35 C1 C3 C4 C5 C6 C7 C8 C9	23	23	46
Events academic / information	A56 A62 B31 B32 B33 B34 B35 C1 C3 C4 C5 C6 C7 C8 C9	2	6	8
Objective test	A56 A62 B31 B32 B33 B34 B35 C1 C3 C4 C5 C6 C7 C8 C9	5	20	25
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.
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.
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.

Personalized attention	
Methodologies	Description
Objective test Guest lecture / keynote speech Supervised projects Events academic / information	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	Description	Qualification
Objective test	A56 A62 B31 B32 B33 B34 B35 C1 C3 C4 C5 C6 C7 C8 C9	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	A56 A62 B31 B32 B33 B34 B35 C1 C3 C4 C5 C6 C7 C8 C9	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	A56 A62 B31 B32 B33 B34 B35 C1 C3 C4 C5 C6 C7 C8 C9	The 4 projects presented will be evaluated, both in their development part and the oral presentation of them in the interactive sessions.	27
Events academic / information	A56 A62 B31 B32 B33 B34 B35 C1 C3 C4 C5 C6 C7 C8 C9	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
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 Tikin (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	

Recommendations

Subjects that it is recommended to have taken before

Facilities III/670G01035
Building Facilities III and Urban Facilities/670G01132
Construction V/670G01126
Foundations and Geotechnics/670G01121
Construction III/670G01122
Building Facilities II/670G01123
Construction IV/670G01125
Construction II/670G01115
Construction I/670G01106
Building Structures II/670G01111
Building Facilities I/670G01112
Mechanical Basics of Building Structures/670G01104
Building Structures I/670G01107

Subjects that are recommended to be taken simultaneously

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.