



| Teaching Guide      |   |        |                       |         |
|---------------------|---|--------|-----------------------|---------|
| Identifying Data    |   |        |                       | 2018/19 |
| Subject (*)         | Construction I  | Code   | 670G01009             |         |
| Study programme     | Grao en Arquitectura Técnica  |        |                       |         |
| Descriptors         |   |        |                       |         |
| Cycle               | Period  | Year   | Type                  | Credits |
| Graduate            | 2nd four-month period   | First  | Obligatory            | 6       |
| Language            | SpanishGalicianEnglish  |        |                       |         |
| Teaching method     | Face-to-face  |        |                       |         |
| Prerequisites       |   |        |                       |         |
| Department          | Construcións e Estruturas Arquitectónicas, Cívís e Aeronáuticas   |        |                       |         |
| Coordinador         | Martín López, Manuel  | E-mail | manuel.martin1@udc.es |         |
| Lecturers           | Martín López, Manuel  | E-mail | manuel.martin1@udc.es |         |
| Web                 |   |        |                       |         |
| General description | <p>Al tratarse de una asignatura del primer curso y una de las específicas de la titulación, el alumno debe revisar y prestar atención a los conocimientos previos adquiridos durante la etapa anterior a su acceso; en especial a las materias de física, matemáticas, geometría y dibujo.</p> <p>En el desarrollo de la materia, se impartirán los conocimientos básicos y generales, de los elementos fundamentales que forman parte de los procesos constructivos de los edificios.</p> <p>El aprendizaje completo de la asignatura, va ligado a otras materias del propio primer curso de la carrera como: materiales de construcción, física, geometría descriptiva y dibujo.</p> |        |                       |         |

| Study programme competences / results |  |
|---------------------------------------|--|
| Code                                  | Study programme competences / results  |
| A2                                    | Adquirir os coñecementos fundamentais sobre os sistemas e aplicacións informáticas específicos e xerais utilizados no ámbito da edificación.                                   |
| A3                                    | Coñecer os materiais, tecnoloxías, equipos, sistemas e procesos construtivos propios da edificación en xeral e en particular aqueles específicos de Galicia.                   |
| A5                                    | Coñecer a evolución histórica dos materiais, tecnoloxías, procedementos, métodos, sistemas e elementos construtivos.   |
| A6                                    | Coñecer e aplicar os distintos sistemas de representación así como as técnicas e procedementos de expresión gráfica aplicados á edificación e ás construcións arquitectónicas. |
| A18                                   | Dirixir e xestionar o proceso de execución da obra.  |
| B1                                    | Capacidade de análise e síntese.   |
| 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.  |
| B8                                    | Capacidade para traballar nun equipo de carácter interdisciplinario.   |
| B12                                   | Razoamento crítico.  |
| B14                                   | Aprendizaxe autónomo.  |
| B16                                   | Capacidade de aplicar os coñecementos na práctica.   |
| B22                                   | Sensibilidade cara a temas de seguridade laboral, accesibilidade, sustentabilidade e medioambiente.  |
| B23                                   | Orientación a resultados.  |
| 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.   |
| B30                                   | Sensibilidade cara a temas relacionados coa protección, conservación e posta en valor do patrimonio cultural e arquitectónico.   |
| C1                                    | Adequate oral and written expression in the official languages.  |
| C3                                    | Using ICT in working contexts and lifelong learning.   |



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| 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 |           |                |
|  | A                                     | B         | C              |
| Coñecer os materiais, tecnoloxías, equipos, sistemas e procesos construtivos propios da edificación en xeral e en particular aqueles específicos de Galicia. | A2                                    | B1        | C3             |
|  | A3                                    | B3        | C6             |
|  | A5                                    | B4        | C7             |
|  | A6                                    | B5        | C8             |
|  | A18                                   | B6        |                |
|  |                                       | B7        |                |
|  |                                       | B8        |                |
|  |                                       | B12       |                |
|  |                                       | B14       |                |
|  |                                       | B16       |                |
|  |                                       | B23       |                |
|  |                                       | B25       |                |
|  |                                       | B26       |                |
|  | B27                                   |           |                |
|  | B30                                   |           |                |
| Capacidade para a resolución de problemas.   |                                       | B5        | C1<br>C4<br>C5 |
| Capacidade de traballo en equipo.  |                                       | B7<br>B22 |                |
| Hábito de estudo e método de traballo.   |                                       | B25       |                |
| Asumir como profesional e cidadán a importancia da aprendizaxe ao longo da vida.   |                                       |           | C7             |

| Contents                           |  |
|------------------------------------|--|
| Topic                              | Sub-topic  |
| LESSON 01 .- BUILDING CONSTRUCTION | General concepts and historical overview: Definitions. Construction. Background of the Engineering Building. Engineering Education Building<br>General analysis of the construction process: Key elements of a building.<br>Complementary elements. Equipment. Auxiliaries. The building in the history<br>The Law of Construction Planning<br>The Technical Building Code |



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| LESSON 02 .- THE LAND ISSUE AND EARTHMOVING   | <p>Introduction to the nature and origin of soils. Degrees of weathering of rocks. Soils. Spanish classification of land according to the CTE. Elementary properties. General. Geotechnical study. The CTE and the geotechnical study.</p> <p>Earthworks: Definition. Previous actions. Preparatory operations. Complementary works. Remove. Pouring. Ditches. Wells. Fillings. Embankments. Unstable slopes. Building on the works of earth fills and embankments compaction. SpongeBob and settlement of land. Digs ground. Drains. Geotextiles.</p> <p>Support facilities in earthworks: Shoring. Shoring. Other methods of shoring and restraint. Auxiliary buildings on the waterfront.</p>   |
| LESSON 03 .- STRUCTURE                        | <p>Structure: Requirements for the structures. Shares in the building. Types of operations or loads. Structural parts. Loads and stresses. Safety factors. Crack deformation. Types of structures: Types of structures by component.</p>   |
| LESSON 04 .- THE FOUNDATION                   | <p>The foundation: Names of terrain features and the shoe. Behavior field. Pressures on the ground. Propagation of stress. Seating area. Constraints of design and construction of a foundation.</p> <p>Classification of foundations: According to their construction materials. According to its depth. Stable foundation on land: Types. Foundations on unstable ground: Types.</p>   |
| LESSON 05 .- CONTAINMENT STRUCTURES           | <p>Retaining walls: Nomenclature. Types of retaining walls. Construction conditions of the retaining walls.</p> <p>Basement walls, basement walls typologies. Construction conditions.</p> <p>Earth pressure: Pressure and thrust. Types. Actions on the wall. Equilibrium conditions of the wall.</p> <p>Screens foundations: Types of retaining walls. Slurry wall construction process.</p> <p>Brackets supporting pillars. Excavation bracing walls and screen. Other systems display bracing walls</p>  |
| LESSON 06 .- STONE PLANTS                     | <p>Factories masonry: Definitions. Running factories masonry. Types of masonry.</p> <p>Factories quarrying: Classes stones used in factories. Nomenclature used in stone mills. Levels in the stonework. The stone work. Transport of blocks. Running stalls factories. Masonry manufacturing gear. Ashlar gear factories. Provision for the coronation of enclosure walls. Durability of the stones. Protection of the stones. Word of the blocks</p>   |
| LESSON 07 .- THE ARCH AND VAULT               | <p>The arc: Components of the arc. Materials from the arc. Structural behavior of the arc. Classification of arches form. The arc discharge. The spontaneous discharge arc. Classification defined surfaces. Union of arcs with the factory. Construction of the arches. Calculation and verification of the arc. Absorption of effort in support. Broken arches. New technologies.</p> <p>The Vault: Vaults simple. Domes. Vaults made???. Timbrel vaults. Construction and materials. Structural behavior. Other construction elements.</p>  |
| LESSON 08 .- THE STRUCTURAL FLOORS AND STAIRS | <p>Horizontal structural elements: Forged. Definition. Functions performed by the cast. Types of floor: concrete slab. Forged metal. Composite floors. Wooden floors. Historical development of the slabs. Reinforcement in slabs. Metal sections. Ribbed plates. Spans. Separators.</p> <p>Types of Forged: Forged flat slab. Ribbed floor. Floor joists military. Prestressed slabs. Forged prelates. Forged hollow core. Special Forgings. Slabs without beams of reinforced concrete.</p> <p>Stairs: Conditions that must comply with the stairs as the CTE. Parts of a ladder. Geometric layout of the ladder: Proportion of the steps. Classification of the stairs. Wood stairs. Compensation curved staircases. Provision of railings.</p> |



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|-------------------------|--|
| TEMA 09.- LA ESCALERA   | 09.01.- Definiciones.<br>09.02.-Tipologías.<br>09.03.-Normativa.   |
| LESSON 09 .- COVER      | Cover: Names of a cover. Classification and covers general concepts: Because of its shape. By its use. From the position of the elements. For their hygrothermal behavior.<br>The flat roof: modern flat roof solutions. Components of the inverted roof. Other types of flat roof.<br>The sloped roof: Components. Cover materials: asphalt plates. Texas. Slate. Slate. Metal. |
| LESSON 11 .- THE LAYOUT | The Stakeout: Preliminary considerations. Rethinking processes and methods. The practice of setting out on site.<br>Rethinking building: Rethinking the earthworks. Staking out the foundation and structure. Staking vertical walls. Tools stake.   |

| Planning                       |  |                                      |                               |             |
|--------------------------------|--|--------------------------------------|-------------------------------|-------------|
| Methodologies / tests          | Competencies / Results                                     | Teaching hours (in-person & virtual) | Student?s personal work hours | Total hours |
| Guest lecture / keynote speech | A2 A3 A5 A6 A18 B1<br>B3 B4 B5 B6 B7 B8<br>B23             | 30                                   | 35                            | 65          |
| Supervised projects            | B12 B14 B16 B22<br>B25 B26 B27 B30 C1<br>C3 C4 C5 C6 C7 C8 | 30                                   | 48                            | 78          |
| Objective test                 | B26 B27 B30 C7   | 4                                    | 0                             | 4           |
| Personalized attention         |  | 3                                    | 0                             | 3           |

(\*)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 | EXHIBITION SESSION<br>There will be exposure for each of the topics of matter, exposing real cases, with the help of photos via powerpoint. The student must have read the topic before and have done the test recommended for the best aprovechamiento for the session.                      |
| Supervised projects            | PRACTICAS DE CLASE<br>Se aplicarán los conocimientos adquiridos en la sesión expositiva para la realización de las prácticas, con una breve exposición por parte del profesor.<br>La nota mínima a obtener para ser considerada en la calificación final será de 3,0 (tres) sobre 10,0 (diez) |
| Objective test                 | REVIEW<br>Will be held on the dates specified for that purpose by the Board of the Centre. No tests will be biased. There will be a first opportunity for a second in June and July. The minimum that must be obtained in the test pair to make half the course work is 3.5 out of 10.        |

| Personalized attention |             |
|------------------------|-------------|
| Methodologies          | Description |
|                        |             |



|                                |   |
|--------------------------------|---|
| Guest lecture / keynote speech | The consultations of the work shall be supervised by the teacher in the classroom during the class of supervised work.  |
| Supervised projects            | <p>In general, all the doubts that arise from reading the notes of the subject, which will be available to students in the Moodle page, the teacher will meet the students' questions via email from Moodle page.</p> <p>Nevertheless, if the profesor creates the desirable, what the student considers it necessary to ask the teacher rotten su customized upon request via email virtual college. By mutual agreement be set day and time for personal attention to students.</p> <p>If teachers predicted by the personal attention of two hours per student / course.</p> |

| Assessment          |  |   |               |
|---------------------|--|---|---------------|
| Methodologies       | Competencies / Results                                     | Description   | Qualification |
| Objective test      | B26 B27 B30 C7   | <p>EXAMINATION</p> <p>It will value the solution of the questions, the accuracy in the result, the quality of graphics and sketches and draws. To be able to combinate with other works must obtain a minimum grade of 4 over 10.</p> | 85            |
| Supervised projects | B12 B14 B16 B22<br>B25 B26 B27 B30 C1<br>C3 C4 C5 C6 C7 C8 | <p>PRACTICAS DE CLASE</p> <p>Serán revisadas y calificadas en el aula, según el programa de la asignatura.</p> <p>La nota mínima a obtener para ser considerada en la calificación final será de 3,0 (tres) sobre 10,0 (diez)</p>     | 15            |
| Others              |  |   |               |

| Assessment comments   |
|---|
| Dont exists part-exams. These criterials evaluation are valid if it complies to the maximum number of students per group approved by Rectorate, otherwise, the teachers will adopt a criterion for evaluating the execution of a exam that he counted 100% of the note course, for all the oportunities corresponding to the subject. |

| Sources of information |  |
|------------------------|--|
| Basic                  | <ul style="list-style-type: none"> <li>- E. Gonzalez Velayos (2000). Aparejadores. Breve historia de una larga profesión . Madrid. CGCOAAT</li> <li>- J. Ferri y otros (2001 ). Apuntes de iniciación a la Construcción . Alicante. Club Universitario</li> <li>- Marta Suárez Baldonado (2006). Construcción con tierra . Consello Galego de Colexios de Aparelladores e Arquitectos Técnicos</li> <li>- Manuel Méndez Lloret (2002). Diccionario básico de la construcción . Barcelona. CEAC</li> <li>- Carles Broto (2001). Diccionario Técnico Arquitectura y Construcción . Instituto Monsa de Ediciones S.A.</li> <li>- A. Gonzalez Rodriguez y otros (2004). Diccionario visual da construción . Santiago. COAG</li> <li>- J. Vazquez Castro y otros (2001 ). El Aparejador y su profesión en Galicia. De los Maestros de Obras a los Arquitectos . Santiago. CGCOAAT</li> <li>- Félix L. Suárez Riestra (2009). Estudio Geotécnico y Mecánica de Suelos . Consello Galego de Colexios de Aparelladores e Arquitectos Técnicos e Enxe&amp;#241;eiros de Edifica</li> <li>- Francisco Arquero (2004). Práctica constructiva . Ediciones CEAC</li> <li>- Nueva Enciclopedia del encargado de obras (2001). Tecnología de la construcción . Grupo CEAC</li> <li>- G. Baud (1994 ). Tecnología de la Construcción . Blume - Naturat S.A.</li> <li>- Luis Ferre de Merlo (2003). Tecnología de la construcción básica . Alicante. Club Universitario</li> <li>- Alberto Serra Hamilton (1997). Términos ilustrados de arquitectura, construcción y otras artes y oficios . Madrid. COAAT</li> <li>- Luis Jimenez Soto (2003). Trabajos de albañilería. Práctica constructiva . Ediciones CEAC</li> </ul> |
| Complementary          |  |

| Recommendations |
|-----------------|
|                 |



## Subjects that it is recommended to have taken before

Mathematics I/670G01001  
Applied Physics I/670G01002  
Materials I/670G01003  
Architectural Graphic Expression I/670G01008  
Geometry of Illustrations/670G01018

## Subjects that are recommended to be taken simultaneously

Descriptive Geometry/670G01004

## Subjects that continue the syllabus

Construction II/670G01011  
Materials II/670G01012  
Auxiliary and Security Equipment/670G01026  
Construction III/670G01017  
Topography/670G01020  
Organisation, Programming and Control/670G01021  
Construction IV/670G01022  
Technical Projects I/670G01023  
Technical Projects II/670G01027  
Administration, Leadership and Management of Construction/670G01028  
Pathology and Rehabilitation/670G01029  
Measurements, Budgets and Economic Control/670G01030  
Security and Prevention/670G01031  
Galician Architectural Heritage/670G01041

## Other comments

For any discrepancy in the teaching guides in any language will be valid the Spanish one.

(\*)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.