



## Teaching Guide

Identifying Data					2015/16
Subject (*)	Construcción III	Code	670G01017		
Study programme	Grao en Arquitectura Técnica				
Descriptors					
Cycle	Period	Year	Type	Credits	
Graduate	2nd four-month period	Second	Obligatoria	6	
Language	Spanish				
Teaching method	Face-to-face				
Prerequisites					
Department	Construções Arquitectónicas				
Coordinador	Caridad Yañez, Francisco Jose	E-mail	francisco.caridad@udc.es		
Lecturers	Caridad Yañez, Francisco Jose Martín López, Manuel	E-mail	francisco.caridad@udc.es manuel.martin1@udc.es		
Web	<a href="http://www.udc.es/departamentos/ga/departamento.asp?Dep=104">http://www.udc.es/departamentos/ga/departamento.asp?Dep=104</a>				
General description	<p><b>CONTENIDOS:</b></p> <p>La asignatura (materia) Construcción III consta de la siguiente unidad docente: Construcción Hormigón Estructural. Estos contenidos se desarrollan en el programa correspondiente que forma parte de este documento. Durante los primeros cursos de implantación del grado se procederá a realizar los ajustes que se estimen necesarios y oportunos según su interacción tanto horizontal como vertical con el resto de materias de la titulación.</p> <p><b>OBJETIVOS DE LA ASIGNATURA:</b></p> <p>El conocimiento de las bases teóricas, tecnología y normativa de los oficios indicados en los contenidos, así como la aplicación práctica de dichos conocimientos, que el alumno debe de ser capaz de dominar y demostrar la capacidad de expresar correctamente soluciones a problemas de construcción estructural.</p> <p>Desarrollar el espíritu crítico y de análisis para desarrollar ordenadamente cualquier problema constructivo relacionado con el programa de la asignatura.</p> <p>Conocer y usar la terminología constructiva y poder expresar con rigor y precisión cualquier redacción técnica, facilitando así la correcta comprensión y transmisión de las ideas.</p> <p>Desarrollar la capacidad de representar, de una forma ágil, por medio de croquis o dibujos claros (en sistema diédrico y acotados), ordenados y correctos, las distintas soluciones constructivas, con las especificaciones técnicas necesarias, entendiendo que es el medio de expresión más riguroso y preciso en el campo de conocimiento de la materia.</p> <p><b>NIVEL DE DIFICULTAD:</b></p> <p>Se trata de una asignatura de amplios contenidos. La amplitud de la materia y la continua referencia a normas de obligado cumplimiento, obligan al alumno a prestar una atención minuciosa tanto en las clases expositivas como interactivas, así como a la bibliografía facilitada. Del mismo modo los trabajos y prácticas de curso deben expresar, con rigor conceptual y gráfico, las soluciones adoptadas. Se exige, en suma, reflexionar mucho más que realizar un mero ejercicio de memoria, aunque este sea necesario.</p> <p>La mayor dificultad de la asignatura no está en aprender los conceptos generales que se asimilan fácilmente (lo cual resulta sumamente engañoso) sino dedicarle, intensamente, el tiempo programado necesario para interpretar correctamente todos los temas tratados y saber expresarlo posteriormente con precisión y rigor.</p>				

## 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.
A8	Deseñar, calcular e executar estruturas de edificación.
A18	Dirixir e xestionar o proceso de execución da obra.
B1	Capacidade de análise e síntese.
B2	Capacidade de organización e planificación.
B5	Capacidade para a resolución de problemas.



B7	Capacidade de traballo en equipo.
B9	Capacidade para traballar nun contexto internacional.
B12	Razoamento crítico.
B13	Compromiso ético.
B14	Aprendizaxe autónomo.
B15	Adaptación a novas situacións.
B21	Motivación pola calidade.
B22	Sensibilidade cara a temas de seguridade laboral, accesibilidade, sustentabilidade e medioambiente.
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	Expresarse correctamente, tanto de forma oral coma escrita, nas linguas oficiais da comunidade autónoma.
C3	Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida.
C4	Desenvolverse para o exercicio dunha cidadanía aberta, culta, crítica, comprometida, democrática e solidaria, capaz de analizar a realidade, diagnosticar problemas, formular e implantar solucións baseadas no coñecemento e orientadas ao ben común.
C5	Entender a importancia da cultura emprendedora e coñecer os medios ao alcance das persoas emprendedoras.
C6	Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.
C7	Asumir como profesional e cidadán a importancia da aprendizaxe ao longo da vida.
C8	Valorar a importancia que ten a investigación, a innovación e o desenvolvemento tecnolóxico no avance socioeconómico e cultural da sociedade.

Learning outcomes

Learning outcomes	Study programme competences / results		
El alumno será capaz de conocer los materiales, tecnologías, equipos, sistemas y procesos constructivos propios de la edificación en general y en particular aquellos específicos de Galicia.	A3		
El alumno será capaz de diseñar y ejecutar estructuras de edificación.	A8		
El alumno será capaz de dirigir y gestionar el proceso de ejecución de la obra.	A18		
El alumno tendrá capacidad de análisis y síntesis.		B1	
El alumno tendrá capacidad de organización y planificación.		B2	
El alumno tendrá capacidad para la resolución de problemas.		B5	
El alumno tendrá capacidad de trabajo en equipo.		B7	
El alumno tendrá capacidad de trabajar en un contexto internacional		B9	
El alumno tendrá compromiso ético.		B13	
El alumno tendrá capacidad para el aprendizaje autónomo.		B14	
El alumno tendrá capacidad para adaptarse a nuevas situaciones.		B15	
El alumno tendrá capacidad de motivación por la calidad.		B21	
El alumno tendrá capacidad de crear un hábito y método de trabajo.		B25	
El alumno tendrá capacidad de comunicación a través de la palabra y de la imagen.		B27	
El alumno tendrá capacidad de sensibilizarse ante temas relacionados con la protección, conservación y puesta en valor del patrimonio cultural y arquitectónico.		B30	
El alumno será capaz de expresarse correctamente, tanto de forma oral como escrita, en las lenguas oficiales de la comunidad autónoma.			C1
El alumno será capaz de utilizar las herramientas básicas de las tecnologías de la información y las comunicaciones (TIC) necesarias para el ejercicio de su profesión y para el aprendizaje a lo largo de su vida.			C3



El alumno será capaz de desenvolverse en el ejercicio de una ciudadanía abierta, culta, crítica, comprometida, democrática y solidaria, capaz de analizar la realidad, diagnosticar problemas, formular e implantar soluciones basadas en el conocimiento y orientación del bien común.			C4
El alumno será capaz de entender la importancia de la cultura emprendedora y conocer los medios al alcance de las personas emprendedoras.			C5
El alumno será capaz de valorar críticamente el conocimiento, la tecnología y la información disponible para resolver los problemas con los que debe enfrentarse.			C6
El alumno será capaz de asumir como profesional y ciudadano la importancia del aprendizaje a lo largo de la vida.			C7
El alumno será capaz de valorar la importancia que tiene la investigación, la innovación, y el desenvolvimiento tecnológico en el avance socioeconómico y cultural de la sociedad.			C8
Razoamento crítico.		B12	
Sensibilidade cara a temas de seguridade laboral, accesibilidade, sustentabilidade e medioambiente.		B22	
Capacidade de razoamento, discusión e exposición de ideas propias.		B26	

Contents	
Topic	Sub-topic



1.- STRUCTURAL CONCRETE CONSTRUCTION.

COURSE SYLLABUS:

1.1.- Historical background: Brief survey of characteristics and properties of concrete. Actual present knowledge of concrete technology. Regulations. EHE Instruction. Spanish Building Code.

1.2.-Basic knowledge of reinforced concrete: The adhesion between concrete and steel. Continuity and chained monolithic reinforced concrete structures. Protection of rebars. Incompatibilities. Durability.

1.3.-Preparing and Setting-up fresh concrete: Mixing in-situ concrete. Ready-mix concrete. Characteristics. Conditions of complete feeding of the fresh concrete delivered. False full cure. Transporting concrete. Setting-up fresh concrete. Pouring and compacted. Setting-up fresh concrete with pump. Sprayed concrete (gunning). Use of additives. Superfluidifiers, Self-compacting concretes. Curing concrete: Precautions. Concreting in cold weather. Concreting in hot weather. Concreting joints.

1.4.-Steel reinforcement: Steels applying to building construction. Identification of steel bars. Geometrical characteristics, mechanical, adherents, apting for welding

1.5.- Types of steel reinforcement: Diameter. Maximum and minimum distances between bars. Corrosion Protection coatings: distance between parameters. Geometric quantities of the reinforcements. Mandrel diameters, hooks of the negative bending and bending bars.

1.6.-Anchoring of reinforcement Steel bar: Types of anchoring. Fittings: overlap, solder, sleeve. Types of anchoring. Mechanical anchoring . Welding

1.7.-Concrete skeletal: Portal Framed structures. Columns. Beams. Cantilever. Cross bars. Bracings and chained. General concepts. Arrangement of reinforcements depending on their mechanical work and the execution conditions. Parts curved path. Broken parts. Execution conditions.

1.8 - Discontinuity in concrete. Staple Regions. Systems struts and ties. Concentrated loads on solid. Joints: Concepts, utility and generalities. Types of joints. Plastic hinges. Deep beams. Corbel.

1.9 - Surface elements. Slabs and supported / embedded in two or more sides plates. Surface systems supported on pillars plates and waffle slabs. Reinforced concrete basement walls: Load-bearing walls. Retaining walls: Types, design criteria. Diaphragm walls. Conditions of execution.

1.10 - Floors: Concept and tough mission. Types of floors. Specific floors: slabs. Conditions of execution. Applicable regulations.

1.11 -Concrete stairs: Typology. Stringers. Slabs. Structural organization. Conditions of execution.

1.12 - Foundations: General. Polls. Precautions and safety conditions. Different types of concrete foundations. Shallow foundations. Rigid pile caps and footings. Flexible footings. Footings, continuous, and combined. Foundation slabs. Deep Foundations: Piles. Typology. Procedures placing. Pile caps. Diaphragm walls. Shoring and anchors. Conditions of execution.

1.13 - Pathology and therapeutic of structural concrete: pathological aspects. Causes of the main pathologies. Symptoms. Repair of structural damage. Determination of the etiology of injury.

1.14 - Prestressed concrete: Concept of prestressing. Historical data. Materials used and their characteristics. Tensioning Systems. Tensioning devices. Cats and anchors. Pods. Splicing of armatures. Injection and sealing. Current regulations and recommendations. Execution Control of prestressed concrete. Tolerances.



Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A3 A8 A18 B1 B2 B5 B7 B9 B12 B13 B14 B15 B21 B22 B25 B26 B30 C1 C4 C5 C6 C7 C8	28	35	63
Workshop	A3 A8 A18 B1 B2 B5 B7 B9 B12 B13 B14 B15 B21 B22 B25 B26 B27 B30 C1 C4 C5 C6 C7 C8	28	18	46
Workshop	A3 B1 B2 B7 B9 B12 B13 B14 B15 B21 B22 B26 B27 C1 C4 C6 C7 C8	0	12	12
Workshop	A3 A8 A18 B1 B2 B5 B9 B12 B13 B14 B15 B21 B22 B26 B27 C1 C4 C6 C7 C8	0	22	22
ICT practicals	C3	0	2	2
Objective test	A3 A8 A18 B1 B2 B5 B12 B13 B15 B21 B26 C1 C4 C7	1	0	1
Long answer / essay questions	A3 A8 A18 B1 B2 B5 B12 B13 B15 B21 B26 C1 C4 C7	2	0	2
Workshop	B7 B13 B26 B27 C1 C4 C6 C8	1	0	1
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	<p>LECTURING HOURS: Oral exposition completed with media use and the introduction of some questions addressed to students, with the aim of transmitting knowledge and facilitate the learning process.</p> <p>It will be included the possibility to programming assistance to scientific events and-or informative, taught to any Centre of the UDC campuses with the aim to deepen the understanding of issues related to the subject study. These activities provide students current knowledge and experience incorporating the latest developments relating to any specific field of study.</p> <p>The student must assume that it is not enough to know only what the teacher discussed in class, but you're bound to get, by their means, other complementary knowledge.</p> <p>From 28:00 hours of attendance per student exhibition scheduled for the course material, non-contact hours 54:00 deemed necessary, the student must devote to their preparation and learning.</p> <p>The official schedule will be adjusted to center hours, maintaining a margin of one week to correct any deviations for any reason, unscheduled might occur.</p>



Workshop	<p>INTERACTIVE PRESENTIAL HOURS: During these classes students can-and must-do consultation and clarification on the work / practice course proposals.</p> <p>The total volume of all works and practicing scheduled expressed in maximum total number of DIN A4, is 20 DIN A4 in the works and 20 DIN A4 practices that make a total of 40 DIN A4 per student and course.</p> <p>From 28:00 of interactive hours contact hours per course and student scheduled for the subject, some 34 non-contact hours are deemed necessary, the student must devote to their training and development.</p> <p>The official schedule will be adjusted to center hours, maintaining a margin of one week to correct any deviations for any reason, unscheduled might occur.</p>
Workshop	<p>HOURS AT HOME (ACADEMIC WORKS FOR THE COURSE): It is scheduled two academic works for the whole semester, framed within the academic units that develop programming matter.</p> <p>Work will be done in groups, with a maximum of five students (minimum 3). Each groups will be maintain immovable during the whole work, so abandonment of any member during completion, it will not be an excuse to not deliver the remaining work and to exhibit or to justify lack of quality and preparation.</p> <p>It is fixed a maximum extension of each of them in 10 DIN A4, from whom and in a approximately way will be established 6 of text, 3 of images and 1 of bibliography used, graphic detailing and similar. In a whole, it is fixed an amount of words/work between 1.800 minimum and 2.500 maximum. (Text type of Word 2007, Calibri fond and body-11).</p> <p>The delivery will be over physical support (paper) or in digital support (*.pdf) through of Moodle depending the way that every lecturer demand delivery in each group.</p> <p>The scheduling of deliveries will be made in the possible mismatch with the delivery of the "works" according to the timetable provided equally purpose by the teacher of each group and whose dates will not be postponed. The average non-contact hours per scheduled work are from 6:00 pm.</p>
Workshop	<p>HOURS AT HOME (PRACTICUM FOR THE COURSE): In the units, it is programmed four (4) practicums.</p> <p>Practicums can include contents of subjects of year before, such as building construction, materials and physics or structures, whose knowledge are considered basic for receiving classes of this subject; moreover an accurate graphic expression will be necessary.</p> <p>The Schedule proposed for practicum deadline will be informed at the beginning of classes.</p> <p>Specific details will be established by coordinator lecturer of this subject.</p>
ICT practicals	<p>IT will be used to perform adequately all proposed activities.</p>
Objective test	<p>THEORETICAL EXAM: Written test used to assess learning process.</p> <p>Mainly, it will be one of the two following ways:</p> <ol style="list-style-type: none"><li>1.- SHORT ANSWER TEST (VIÑETAS-TYPE): Written test to recover learning. It is presented a question to answer, with a definition, classification, brief or similar, and/or required graphic detailing</li><li>2.- MULTIPLE ANSWER TEST: Written test to select the correct answer between several options.</li></ol> <p>For this methodology it is scheduled about 1:00 presential hours maximun</p>
Long answer / essay questions	<p>PRACTICAL PART OF THE EXAM: Part of the assessment process that tries to a written answer (mainly in graphic representation way) to problems-answers-details, valuating reasonable skills, creativity and critical thought.</p> <p>It is scheduled a whole of a maximun of 1:30 presential hours</p>
Workshop	<p>SIGNATURE OF 12 ITEMS:</p> <p>It is established the following item groups: 1) and 2) Assistance; 3) and 4) punctuality; 5) and 6) attention; 7) and 8) class notes; 9) observation of the delivery and presentation standards established in jobs and internships; 10) and in the bibliography (690-2010 ISO, with the first element-date quotes footer); last 11) and 12) the ability to work in groups with their manifestations through oral and visual presentation, by its components.</p> <p>It is scheduled for this methodology a total of 0:30 hours maximum approximate attending classes, but in reality its observation will take place throughout the student's classroom programming.</p>



## Personalized attention

Methodologies	Description
Workshop Guest lecture / keynote speech	<p>This activity can unfold in person (directly in the classroom and / or times that the teacher has assigned to tutoring office) or non-contact (through email or virtual campus, through spaces Moodle communication tool).</p> <p>Two distinct and complementary operational are distinguished:</p> <p>1 -SMALL GROUP TUTORING: its realization is important to consult with the teacher the progress that is being gradually implemented to provide the necessary guidance and in each case to ensure the quality of the work according to the criteria that you specify.</p> <p>Monitoring should preferably collectively according to the teacher being individualized monitoring if deemed necessary in the exposed operational.</p> <p>2 -PERSONALIZED SERVICE OF TUTORING: Recommended for use by students, with the teacher every booking time to address and resolve the doubts of the students regarding specific aspects of the subject.</p> <p>Generally must be requested in advance for the teacher to organize and establish its realization as it should be, as appropriate in each case. They must also be distributed throughout the course, avoiding concentrations on the eve of exams.</p>

## Assessment

Methodologies	Competencies / Results	Description	Qualification
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<p>Workshop</p>	<p>B7 B13 B26 B27 C1 C4 C6 C8</p>	<p>SIGNATURE OF 12 ITEMS:</p> <p>Of the 12 items that arise if evaluate and assess positive over 2/3 of them summative score would be obtained as follows: the 12% of the total item valuation that is 2 points is reached, 11 items obtained 1.5 points, 1 point with 10 items, with 9 items 0.5 and 8 items or less no points would increase under this heading. These points are summative, ie you will increase the set of other tests, provided that the same minimum and medium identified, greater than or equal to four (4.0) are met; and in all of them (jobs, internships, objective tests and essay tests-development) greater or equal to five note (5.0) is obtained.</p> <p>(See comments and other indications of this teaching guide).</p> <p>Given the nature of the items and the nature of continuous assessment with no final test established in the art, non-positive valuation of more than two thirds of them involve a grade of NP (not shown) at the first opportunity, indicating that on the second occasion (July), this requirement is set to nO imperative, since his character is not exportable to the opportunity.</p> <p>The 12 items that arise and value are:</p> <p>1 - Attendance at lectures. Positively to compute the item, you must have at least 80% of classes taught.</p> <p>.2 - Attendance at interactive classes: Same as above</p> <p>3 ?Punctuality at lectures. Positively to compute the item, it must be at least 80% in the classes given. Be understood positively not enter class later than 5 minutes after the time set in the middle.</p> <p>. 4 ? Punctuality at interactive classes: The same as above</p> <p>5.-Attention to lectures: To compute the item positively must have a minimum of 80% in the classes given. Attitudes such as NO use of mobile or any other device for unscheduled topics or issues in class (unless the professor stated at the beginning of the class waiting for a message or call urgent), proximity within the group is understood to positively teacher or focus, consensus standard classroom between teacher and students (not away, hide, barricade, etc..), in a clear sign of disinterest.</p> <p>6 ? Attention to lectures. The same as above.</p> <p>7.-Portfolios manuscript notes of lectures: To compute the item positively must have a minimum of 80% in the classes given.</p> <p>It will consist of the student in each class take minimal notes or manuscripts that consider the extension on those aspects or considerations it deems necessary or essential to complete and further develop the topics covered. With the particularity that on top of the sheet used to record the date that class, subgroup, full name, in that order. With these notes a physical or virtual portfolio will be created, as indicated by each teacher and will be given in the schedule of dates that is made in the early going and always before performing any of the objective tests scheduled (theoretical examinations).</p> <p>8 - Portfolios of handwritten notes interactive classes. Same as above ... and always before performing any of the tests scheduled test-development (practical exams).</p> <p>9 - Monitoring the delivery and presentation standards established in papers, practical and objective tests and test-development. Positively to compute the item, you must have a minimum of 80% of the work and practices according to the rules of delivery and presentation. That is, five (5) out of six (6). And the objective and test-development tests (exams), identified as specified.</p> <p>10.-Observing the rules of inclusion and presentation of the literature on group work: To compute the item positively must have a minimum of 100% of the group work according to the rules of inclusion and presentation bibliography therein. That is, two</p>
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(2) of a total of two (2). ISO 690-2010, first element-date with quote by superscript footnotes will be used. The literature will comprise at least the following documentary sources consulted: Monograph 3, 2 Standards and 1 Website page.

11.-Group work, oral presentation: To compute the item positively to each member of the group, must be at least 100% of group work submitted under the guidelines established for them. That is, two (2) of a total of two (2). It consist of at least each student must submit a piece of work interacting with the parties to submit their colleagues how they see fit, being able to adequately respond to the clarifications thereon are developed by their peers or teacher.

12.-Group work, audiovisual presentation: Same as above ... Each student will complete and support his presentation with audio-visual presentation support the group has done (PowerPoint or similar, board, etc..).

(See comments and other indications of this teaching guide).



Workshop	A3 B1 B2 B7 B9 B12 B13 B14 B15 B21 B22 B26 B27 C1 C4 C6 C7 C8	COURSE WORK GROUP: To compute the weighted% of the course work, they must be submitted a minimum of 50%, ie 1 of the 2 proposed work (as well as make the presentation thereof); and achieving the same average of 4 out of a total of 10 points (ie 8 out of a total of 20 points). Failure to provide one will be an NP (not shown) at the first opportunity, unless the student in writing to communicate to the teacher requesting to be equally qualified end of the year, with at least 6 days before the date set for the start of the evaluation period in the academic calendar. Your correction will be possible after delivery week and his rating at least 3 days before the date set for the start of the evaluation period in the academic calendar. In July a second chance, that requirement must be set as NO. (See comments and other indications of this teaching guide).	16
Workshop	A3 A8 A18 B1 B2 B5 B9 B12 B13 B14 B15 B21 B22 B26 B27 C1 C4 C6 C7 C8	PRACTICUM: To compute the% of practices course, he should have submitted a minimum of 50%, ie, 2 of the 4 proposed practice and achieving average 4 out of a total of 10 points (ie 16 points out of a total of 40 points). Failure to provide one will be an NP (not shown) at the first opportunity, unless the student in writing to communicate to the teacher requesting to be equally qualified end of the year, with at least 6 days before the date set for the start of the evaluation period in the academic calendar. Your correction will be possible after delivery week and his rating at least 3 days before the date set for the start of the evaluation period in the academic calendar. In July a second chance, that requirement must be set as NO. (See comments and other indications of this teaching guide).	24



Long answer / essay questions	A3 A8 A18 B1 B2 B5 B12 B13 B15 B21 B26 C1 C4 C7	<p>PRACTICAL PART OF THE EXAM: At the first opportunity, throughout the semester two practical examinations, that to compute the% weighted set for themselves be scheduled, should reach average 4 out of a total of 10 points (ie 8 points on a total of 20 points). The completion of these tests is set to YES essential requirement to pass the course. The measurement details, questions or requested exercises indicate beside each. Time 40 minutes each. Failure to submit one of them will be an NP (not shown) at the first opportunity.</p> <p>Exceptionally, whenever it deems the affected (being specifically excluded) teacher, the student can adequately justify in writing, as early as possible the existence of any of the 6 events set forth in art. 12 (&amp;quot;Standards of evaluation, review and claim the qualifications of graduate and university maestrado&amp;quot; approved by the CG: 19-December 2013), the completion of the assessment test in question, in the last week class of the semester.</p> <p>The rating of at least the 1st test (50% of total), be made at least 3 days before the date set for the start of the evaluation period in the academic calendar, without prejudice to the publication of the final provisional ratings , having no overall assessment test matter, with 7 days before the end date of the closing of records.</p> <p>The second time (July), one practical examination computing the 60% of the total, which have to reach 4 points out of 10 to proceed to this computation is scheduled. The measurement details, questions or requested exercises indicate beside each. Time 80 minutes.</p> <p>(See comments and other indications of this teaching guide).</p> <p>In general constructive remedies under the rules applicable under the material used, representing all those auxiliaries necessary for its implementation and operation are indicated. Will mainly occur in ink or pencil and ink passing only the main elements, the latter having sufficient sharpness for adequate legibility for a standard optical system.</p> <p>The drawings will be represented in dihedral projections, map views and scale appropriately bounded. Are not allowed in or out of scale perspective. The number of views in each case, shall be such that the resulting geometric definition thorough and complete, so you can build what is involved with the data provided and the site supervisor can interpret.</p> <p>Any missing or incomplete data shall be set by the student at their discretion.</p> <p>Presentation is as verbally or indicated by diagram is attached in the statement.</p> <p>In different constructive details and requested sections, all the elements involved in them to run properly represent, not admitting indefinite generic representations (as in white frames or scratched).</p> <p>Within half an hour after the start of the exam, students may not leave the room, or leave the table-board working to end (except for just cause) and have collected all the students on the test. Those who decide to leave the examination during the first half hour exam sheet delivered with the forenames, subgroup number and signature before leaving it.</p> <p>(See comments and other indications of this teaching guide).</p>	24
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Objective test	A3 A8 A18 B1 B2 B5 B12 B13 B15 B21 B26 C1 C4 C7	<p>THEORETICAL EXAM: At the first opportunity, throughout the semester four theoretical examinations, that in order to compute the % weighted established for the same is scheduled, it should reach half 4 out of a total of 10 points (s say 16 points out of a total of 40 points). The completion of these tests is set to YES essential requirement to pass the course. Failure to submit one of them will be an NP (not shown) at the first opportunity.</p> <p>Exceptionally, whenever it deems the affected (being specifically excluded) teacher, the student can adequately justify in writing, as early as possible the existence of any of the 6 events set forth in art. 12 (&amp;quot;Standards of evaluation, review and claim the qualifications of graduate and master&amp;quot; approved by the CG: 19-December 2013), the completion of the assessment test in question, in the last week class of the semester.</p> <p>The rating of at least the first 2 tests (50% of total), be made at least 3 days before the date set for the start of the evaluation period in the academic calendar, without prejudice to the publication of the final provisional ratings, having no overall assessment test matter, with 7 days before the end date of the closing of records.</p> <p>The second time (July), a single theoretical examination computing the 40% of the total, which have to reach 4 points out of 10 to proceed to this computation is scheduled.</p> <p>(See comments and other indications of this teaching guide).</p> <p>The objective test may be essentially one of the following two ways:</p> <p>1 - SHORT ANSWER TEST (TYPE-VIÑETAS). At the first opportunity will consist of 4 tests with 4 questions each in principle with the same score each, otherwise it will indicate the margin the corresponding score. Time 16 minutes.</p> <p>The second time will be composed of one test with 5 questions in principle with the same score each, otherwise it will indicate the margin the corresponding score. Time 20 minutes.</p> <p>Responses to ink will adhere to the area I boxed for each.</p> <p>Originally examination students may not leave the room or leave the table-board working to end (except for just cause) and have collected all the students on the test.</p> <p>All graphic details will be made provided with precise information (dimensions, designations, etc..) For proper definition and / or interpretation by a supervisor.</p> <p>2 - MULTIPLE ANSWERS TEST (TYPE-TEST). At the first opportunity will be composed of 4 tests with 10 questions each. The valuation of the questions is the same for each, can be three cases: correct Replies +1.00 points, -0.60 points erroneous response, blank responses + / -0.00 points. Time 6 minutes.</p> <p>The second time will be composed of one test with 20 questions. The valuation of the questions is the same for each, can be three cases: correct Replies +0.50 points, -0.30 points erroneous response, blank responses + / -0.00 points. Time 12 minutes.</p> <p>The answer is considered correct is marked with a cross (X) in ink in the appropriate box.</p> <p>Any amended answer is void.</p> <p>There is always one and only one correct answer.</p> <p>Initiated any objective test modes listed above, students may not leave the room, or leave the table-board working to end (except for just cause) and have collected all the students on the test.</p> <p>(See comments and other indications of this teaching guide).</p>	16
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Sources of information



## Basic

REFERENCIAS BIBLIOGRÁFICAS CONSTRUCCIÓN III OBSERVACIONES: En el campo [Resumen], se indica, con tres asteriscos la bibliografía básica, con dos la de apoyo y con uno la recomendada para consulta o ampliación de cuestiones puntuales. También se reseña el Centro de la UDC donde localizarla con sus signaturas, que se completaran con las ediciones más recientes. Apartados: Tratados Generales, Normas y Hormigón. TRATADOS GENERALES Enciclopedia de la construcción. Barcelona: Editores Técnicos Asociados, 1974; 1979. 9 v; Contiene: T.I : Detalles de arquitectura -- T.II : Cálculos y ensayos, estudios de los proyectos de proyectos I -- T.III : Cálculos y ensayos, estudios de los proyectos II. T.IV : Ejemplos de arquitectura I -- T.V : Ejemplos de arquitectura II -- T.VI : Técnicas de construcción I -- T. VII : Técnicas de construcción II. ISSN/ISBN: 84-7146-124-2. [Resumen: \*. EUAT: 69/0001]. AVENDAÑO PAISAN, Ramiro. Construcción I. Tecnología de la edificación. Madrid: Escuela Técnica de Arquitectura, 197-?. 143 p. [Resumen: \*\*. EUAT: 69/0133 F]. AVENDAÑO PAISAN, Ramiro. Construcción II y III. Madrid: Escuela Técnica de Arquitectura, 1970?. II.; 2 v; Contiene: V.1.Cantería, carpintería de armar. -- V.2. Ampliación: hormigón armado. [Resumen: \*\*\*. EUAT: 69/0131(2) A 2 c.2]. AZCONEGUI MORÁN, Francisco; and CASTELLANOS MIGUÉLEZ, Agustín. El trabajo de la piedra guía práctica de la cantería. León: Escuela Taller de Restauración "Centro Histórico" : Editorial de los Oficios, 1993. ID: 377. ISSN/ISBN: 84-87469-45-0. [Resumen: \*. EUAT: 69/0101 G]. BAUD, G. Tecnología de la construcción. Barcelona: Blume, 1994. 447 p. ID: 354; G. Baud. ISSN/ISBN: 84-8076-060-5. [Resumen: \*. EUAT: 69/0260 Ñ]. HUERTA, Santiago. Arcos, bóvedas y cúpulas geometría y equilibrio en el cálculo tradicional de estructuras de fábrica. Madrid: Instituto Juan de Herrera, [2004]. ID: 381. ISSN/ISBN: 84-9728-129-2. [Resumen: \*. EUAT: 69/0548 B]. PARICIO ANSUATEGUI, Ignacio. La Construcción de la arquitectura. 3, La composición, la estructura. Barcelona: Institut de Tecnologia de la Construcció de Catalunya, 1994. 109 p. ID: 358; 3, La composición, la estructura / Ignacio Paricio. ISSN/ISBN: 84-7853-244-7. [Resumen: \*. EUAT: 69/0563(3) C (DCA)]. PARICIO ANSUATEGUI, Ignacio. La Construcción de la arquitectura. 1, Las técnicas. 3ª rev ed. Barcelona: Institut de Tecnologia de la Construcció de Catalunya, 1995. 117 p. ID: 356. ISSN/ISBN: 84-7853-291-9. [Resumen: \*. EUAT: 69/0563(1) (DT)]. PARICIO ANSUATEGUI, Ignacio. La Construcción de la arquitectura. 2, Los elementos. 3ª ed. Barcelona: Institut de Tecnologia de la Construcció de Catalunya, 1996. ID: 357; 2, los elementos.; 1 v. ; 23 x 24 cm; Los elementos. ISSN/ISBN: 84-7853-293-5. [Resumen: \*. EUAT: 69/0563(2) (DT)]. RÍO ZULUAGA, Juan M. La Construcción en las estructuras. 1st ed. Madrid: Del Río Zuluaga, Juan Manuel, 1991. 436 p. D.L.: M-34263-1991. ISSN/ISBN: 84-604-0450-1. [Resumen: \*\*\*. EUAT: 69/0383 E]. RISEBERO, Bill. Historia dibujada de la arquitectura. Madrid: Celeste, 1993; 1991. 271 p. ID: 355; Bibliogr. ISSN/ISBN: 84-87553-16-8. [Resumen: \*. EUAT: 72.03/0162]. SCHMITT, Heinrich; and HEENE, Andreas. Tratado de construcción. 8ª rev y amp ed. Barcelona: Gustavo Gili, 2009. 709 p. ID: 353; Heinrich Schmitt, Andreas Heene. ISSN/ISBN: 978-84-252-2258-0. [Resumen: \*\*\*. EUAT: 69/0409 A]. URBÁN BROTONS, Pascual; and MARCOS PORTAÑA, Enrique. Apuntes de construcción II-III Arquitectura Técnica. Alicante: Editorial Club Universitario, 1996. Pascual Urbán Brotons, Enrique Marcos Portaña.; v; V.II. Estructuras metálicas -- v.III. Estructuras de madera. ISSN/ISBN: 84-89522-33-2. [Resumen: \*\*. EUAT: 624/0192 (3)]. NORMAS NTE's. 6ª ed. Madrid: Soft, 2005. [Recurso electrónico] : Normas tecnológicas de la edificación.; 1 disco compacto (CD-ROM; Colección completa de detalles NTE en formatos PDF, DWG, DXF, WMF, CSM, DGN y Presto. [Resumen: \*. EUAT: CD-ROM/0003 G]. Código técnico de la edificación : CTE. Madrid: Garceta, 2009. 1050 p. En port.: Incluye Orden VIV/984/2009 de 15 de abril.; Actualizado abril de 2009. ISSN/ISBN: 978-84-9372-089-6. [Resumen: \*\*\*. EUAT: 006/0122 ]. España. Ministerio de Fomento. Centro de Publicaciones. EHE-08 : instrucción de hormigón estructural : con comentarios de los miembros de la Comisión Permanente del Hormigón. Serie Normativas (España. Ministerio de Fomento). 2ª ed. Madrid: Centro de Publicaciones, Ministerio de Fomento, 2009. 702 p. ISSN/ISBN: 978-84-498-0830-2. [Resumen: \*\*\*. EUAT: 006/0119 U ]. NOTA: Eurocódigos, Normas UNE , Normas NBE y Normas Tecnológicas afines a los temas del programa, las derogadas con carácter exclusivo de consulta. HORMIGÓN Hormigón. 1, In situ. Tectónica : monografías de arquitectura, tecnología y construcción. 5ª ed. Madrid: ATC ediciones, 2002. 113 p. 019: M. 4303-1996; 1, In situ.; In situ. [Resumen: \*. EUAT: 69/0454 C (DT)]. Hormigón. 2, Prefabricado. Tectónica : monografías de arquitectura, tecnología y construcción. 4ª ed. Madrid: ATC ediciones, 2003. 110 p. 019: M. 4303-1996; 2, Prefabricado. [Resumen: \*. EUAT:69/0452 C (DT)]. Hormigón. III. Tectónica : monografías de arquitectura, tecnología y construcción. Madrid: ATC Ediciones, 2007. 124 p. 019: M.4303-1996; III.; Proyectos: Toyo Ito et Associates, Jesús Aparicio Guisado, Ignacio Laguillo y Harald Schönegger, Diego García-Setién y Silvia Sánchez. [Resumen: \*. EUAT: 69/0452 C (DT)]. CALAVERA, J. Drenaje de plantas bajas de edificios y drenaje e impermeabilización de sótanos. Monografías INTEMAC. Madrid: Intemac, 1998.



78 p. J. Calavera ...[et al.]. ISSN/ISBN: 84-87892-22-1. [Resumen: \*. EUAT: 69/0285]. CALAVERA, J. Aspectos visuales del hormigón visto, hormigón coloreado, hormigón con tratamientos superficiales. Monografías INTEMAC. Madrid: Intemac, 2000. 139 p. J. Calavera Ruiz ... [et al.]; Bibliografía. ISSN/ISBN: 84-87892-25-6. [Resumen: \*. EUAT: 691/0302 (DCA)]. CALAVERA, J. Cálculo de estructuras de cimentación. 4ª ed. Instituto Técnico de Materiales y Construcciones, 2000. 519 p. Bibliogr. ISSN/ISBN: 84-88764-09-X. [Resumen: \*\*\*. EUAT: 624/0360 J]. CALAVERA, J. Cálculo, construcción, patología y rehabilitación de forjados de edificación unidireccionales y sin vigas-hormigón metálicos y mixtos. 5ª ed. Madrid: Intemac, 2002. 1024 p. Índice.; Bibliogr. ISSN/ISBN: 84-88764-14-9. [Resumen: \*\*. EUAT: 624/0662 G (DCA) c.2]. CALAVERA, J. Proyecto y cálculo de estructuras de hormigón : en masa, armado y pretensado. 2ª ed. Madrid: Intemac, 2008. 2 v; De acuerdo con la nueva instrucción EHE-08 y EUROCÓDIGO EC-2. ISSN/ISBN: 84-88764-24-9; 84-88764-25-6; 84-88764-05-7. [Resumen: \*\*\*. EUAT: 624/0273(1)]. CALAVERA, J.; and Instituto Técnico de Materiales y Construcciones. Muros de contención y muros de sótano. 3ª ed. Madrid: Instituto Técnico de Materiales y Construcciones, 2001. 377 p. ISSN/ISBN: 84-88764-10-3. [Resumen: \*\*\*. EUAT: 624/0344 I (DCA)]. CALAVERA, J.; and Instituto Técnico de Materiales y Construcciones. Ejecución y control de estructuras de hormigón. Madrid: Intemac, 2004. 937 p. J. Calavera Ruiz... [et al.]. ISSN/ISBN: 84-88764-19-7. [Resumen: \*. EUAT: 624/0498 B (DCA)]. CALAVERA, J.; and Instituto Técnico de Materiales y Construcciones. Patología de estructuras de hormigón armado y pretensado. 2ª ed. Madrid: Intemac, 2005. 2 v. : il. ISSN/ISBN: 84-88764-21-9. [Resumen: \*\*. EUAT: 624/0605(1) 1]. CALAVERA, J.; and Instituto Técnico de Materiales y Construcciones. Fichas de ejecución de obras de hormigón. 3ª de acuerdo con EHE-08 ed. Madrid: Intemac, 2009. 76 p. ISSN/ISBN: 9788487892196. [Resumen: \*\*. EUAT: 691/0551]. CALAVERA, J.; Instituto Técnico de Materiales y Construcciones; and Asociación Nacional de Industriales de Ferralla. Manual de ferralla. 3ª ed. Madrid: Instituto Técnico de Materiales y Construcciones : Asociación Nacional de Industriales de Ferralla, 2003. 243 p. J. Calavera Ruiz...[et al.]. ISSN/ISBN: 84-88764-17-0. [Resumen: \*\*. EUAT: 691/0287 (DCA)]. GARCÍA MESEGUER, A. Estructuras de hormigón armado. 4ª , 1ª reimp ed. Madrid: Fundación Escuela de la Edificación, 2001. 3 v; v. 1. Materiales, ejecución, control, patología -- v. 2. Cálculo en estados límite--v. 2. Elementos estructurales. ISSN/ISBN: 84-86957-85-0; 84-86957-86-9; 84-86957-87-7. [Resumen: \*\*\*. EUAT: 624/0440(1)]. GONZÁLEZ-ISABEL, Germán. Hormigón de alta resistencia Características, dosificación, puesta en obra, posibilidades. Madrid: Intemac, 1993. 316 p. Germán González-Isabel. ISSN/ISBN: 84-87892-13-2. [Resumen: \*. EUAT: DEP2/3139 c.2]. Grupo Español del Hormigón. Comisión I - G.T. I/2. Hormigones de alta resistencia fabricación y puesta en obra. Boletín GEHO. Madrid: Geho, 1997. 113 p. Datos tomados de la cub. ISSN/ISBN: 84-89670-02-1. [Resumen: \*. EUAT: DEP2/0323 ]. JIMÉNEZ MONTOYA, P., et al. Hormigón armado. 15ª ed. Barcelona: Gustavo Gili, 2009. 629 p. Jiménez Montoya ; Álvaro García Meseguer, Francisco Morán Cabre, Juan Carlos Arroyo Portero.; En la port.: Ed. basada en la EHE 2008. Ajustada al código modelo y al eurocódigo EC-2.; Índice. Bibliogr. ISSN/ISBN: 978-84-252-2307-5. [Resumen: \*\*\*. EUAT: 624/0091]. LEONHARDT, Fritz; and MÖNNIG, Eduard. Estructuras de hormigón armado / pretensado. 6V. 2ª rev ed. Buenos Aires ; Barcelona etc.: El Ateneo, 1986-1988. Fritz Leonhardt, Eduard Mönnig.; ISSN/ISBN: 950-02-5242-2; 950-02-5259-7; 950-02-5263-5. [Resumen: \*. ETSA: INV (ARQ) 1062]. MARTÍN ANTÓN, Manuel L.; and GARRIDO HERNÁNDEZ, Antonio. La EHE explicada por sus autores. 2ª ed. Madrid: Leynfor Siglo XXI, 2003. 338 p. [Manuel L. Martín Antón ... [et al.]; Antonio Garrido Hernández, coord.]. ISSN/ISBN: 84-9556005-4; 84-932834-3-6. [Resumen: \*. EUAT: 006/159]. PELLICER DAVIÑA, Domingo; and SANZ LARREA, Cristina. El hormigón armado en la construcción arquitectónica. 2ª adaptada a la EHE-08 y al CTE ed. Madrid: Bellisco, 2010. 819 p. por Domingo Pellicer Daviña, Cristina Sanz Larrea.; Bibliogr. ISSN/ISBN: 978-84-96486-94-2. [Resumen: \*\*. EUAT: 624/0550]. SERRANO LÓPEZ, Miguel Á. Diseño de elementos de hormigón armado problemas resueltos de acuerdo con EHE. Biblioteca técnica universitaria. Madrid: Bellisco, 2002. 1 v. (pág. var; Estructuras; Adaptados a la EHE-98. ISSN/ISBN: 84-95279-55-X. [Resumen: \*\*. EUAT: 624/0463]. WINTER, George; and NILSON, Arthur H. Proyecto de estructuras de hormigón. Barcelona: Reverté, 2002. 721 p. George Winter, Arthur H. Nilson.; Elaborado sobre un libro de texto de L. C. Urquhart y C. E. O'Rourke. (2008 reimp). ISSN/ISBN: 84-291-2076-9. [Resumen: \*. EUAT: 624/290]. ???



Complementary

## Recommendations

### Subjects that it is recommended to have taken before

Estruturas II/670G01025  
Patoloxía e Rehabilitación/670G01029  
Estruturas III/670G01034  
Métodos experimentais de inspección de Estruturas/670G01039  
Patrimonio Arquitectónico galego/670G01041

### Subjects that are recommended to be taken simultaneously

Xeometría da Representación/670G01018  
Estruturas I/670G01019

### Subjects that continue the syllabus

Matemáticas I/670G01001  
Física Aplicada I/670G01002  
Materiais I/670G01003  
Xeometría Descritiva/670G01004  
Matemáticas II/670G01006  
Física Aplicada II/670G01007  
Expresión Gráfica Arquitectónica I/670G01008  
Construción I/670G01009  
Construción II/670G01011  
Materiais II/670G01012  
Expresión Gráfica Arquitectónica II/670G01013  
Materiais III/670G01016

### Other comments

Dado que el perfil principal de la asignatura esta referenciado a la ?construcción estructural?, se considera que cuanto mayor sea el conocimiento sobre estructuras, materiales; así como una amplia y desarrollada visión espacial junto con una soltura fluida en la expresión gráfica; son fundamentales para un menor esfuerzo y tiempo requerido a la hora de la comprensión y resolución de los aspectos tratados en la asignatura.

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