Teaching Guide				
Identifying Data				2024/25
Subject (*)	Construction 3		Code	630G02022
Study programme	Grao en Estudos de Arquitectura			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	Third	Obligatory	6
Language	SpanishGalicianEnglish			
Teaching method	Face-to-face			
Prerequisites				
Department	Construcións e Estruturas Arquitectónicas, Civís e Aeronáuticas			
Coordinador	Rodriguez Garcia, Enrique	E-mail	enrique.rodriguez.garcia@udc.es	
Lecturers	Muñoz Fontenla, Carlos M. Rodriguez Garcia, Enrique	E-mail	c.fontenla@udc.es enrique.rodriguez.garcia@udc.es	
Web				
General description	Estudio de los materiales elementos y sistemas constructivos de las edificaciones con estructura porticada realizada con metales y madera. El desarrollo de los sistemas constructivos incluye: encuadre histórico, tipologías, materiales, normativa, concepción, diseño, seguridad, valoración, prescripción, conservación, patologías y reparación. This course comprises the study of materials, components and assemblies of buildings with steel frames and timber frames. Building assemblies will be analysed from several perspectives: historic context, types, materials, building regulations, design, safety, technical assessment, choice of materials and systems, pathologies and remedial works.			

Study programme competences / results	
Code	Study programme competences / results
A12	Ability to conceive, calculate, design, integrate in buildings and urban units and execute building structures (T)
A17	Ability to apply technical and construction standards and regulations
A18	Ability to maintain building structures, foundations and civil works
A20	Ability to assess the construction works
A25	Adequate knowledge of conventional construction systems and pathology
A26	Adequate knowledge of the physical and chemical characteristics, production procedures, pathology and use of building materials
A27	Adequate knowledge of industrialized building systems
A31	Knowledge of methods of measurement, assessment and expert´s report
A32	Knowledge of the project of health and safety at the construction site
A63	Development, presentation and public review before a university jury of an original academic work individually elaborated and linked to any of the subjects previously studied
B1	Students have demonstrated knowledge and understanding in a field of study that is based on the general secondary education, and is usually at a level which, although it is supported by advanced textbooks, includes some aspects that imply knowledge of the forefront of their field of study
B2	Students can apply their knowledge to their work or vocation in a professional way and have competences that can be displayed by means of elaborating and sustaining arguments and solving problems in their field of study
B3	Students have the ability to gather and interpret relevant data (usually within their field of study) to inform judgements that include reflection on relevant social, scientific or ethical issues
B4	Students can communicate information, ideas, problems and solutions to both specialist and non-specialist public
B5	Students have developed those learning skills necessary to undertake further studies with a high level of autonomy
B6	Knowing the history and theories of architecture and the arts, technologies and human sciences related to architecture
B7	Knowing the role of the fine arts as a factor that influences the quality of architectural design

B9	Understanding the problems of the structural design, construction and engineering associated with building design and technical solutions
B10	Knowing the physical problems, various technologies and function of buildings so as to provide them with internal conditions of comfort and protection against the climate factors in the context of sustainable development
B11	"Knowing the industries, organizations, regulations and procedures involved in translating design concepts into buildings and integrating plans into planning "
B12	Understanding the relationship between people and buildings and between these and their environment, and the need to relate buildings and the spaces between them according to the needs and human scale
C1	Adequate oral and written expression in the official languages.
C3	Using ICT in working contexts and lifelong learning.
C4	Exercising an open, educated, critical, committed, democratic and caring citizenship, being able to analyse facts, diagnose problems, formulate and implement solutions based on knowledge and solutions for the common good
C5	Understanding the importance of entrepreneurial culture and the useful means for enterprising people.
C6	Critically evaluate the knowledge, technology and information available to solve the problems they must face
C7	Assuming as professionals and citizens the importance of learning throughout life
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		
Qualify to the student to project the construction splitting of the architectural approach. Contribute him the necessary knowledges so that it appreciate the architectural repercussions of each constructive system and of each material in the project, treating to find the difficult balance between this and his construction. Understand the architecture from the construction, what will allow to value no only technical solutions, but enrich the creation of the space matizándola by means of the concretion of the constructive detail.	A12 A17 A18 A20 A25 A26 A27 A31 A32 A63	B1 B2 B3 B4 B5 B6 B7 B9 B10 B11 B12	C1 C3 C4 C5 C6 C7 C8
Improve a constructive reasoning critic that deepen in the architectural and functional requests "the «reasons»" of a constructive element (colour, texture, functions), the investigation on the way to make it "«with what» and «how»", and the discovery of the sensitivity, the qualities and problems of the material and of his technological system. Know the systems porticados in metals, especially steel and wood supporting in the study of good buildings of architects of excellence recognised, using for this the practical classes. They will analyse the provision of the system and the characteristics of the elements, of the unions and of the material. Finally, it will happen to the concretion of specifications and to the handle of the applicable rule.	A12 A17 A18 A20 A25 A26 A27 A31 A32 A63	B1 B2 B3 B4 B5 B6 B7 B9 B10 B11 B12	C1 C3 C4 C5 C6 C7 C8

Initiate to the student in the development of documents of project that express the architectural fact together with his construction, endowing him of rigour, specificity, coherence and clarity in his graphic expression and written.	A12 A17 A18 A20 A25 A26 A27 A31 A32 A63	B1 B2 B3 B4 B5 B6 B7 B9 B10 B11 B12	C1 C3 C4 C5 C6 C7 C8

Contents	
Topic	**Sub-topic**
Introducción. Los sistemas porticados Los sistemas porticados en la composición arquitectónica Introduction. Skeleton construction and its architectural implications.	Aspectos históricos de los sistemas porticados. Contraposición entre los espacios de la arquitectura de muros de carga y la de sistemas porticados. Los sistemas porticados y las particiones: ordenación y relación. La esquina en los sistemas de pórticos. Funcionamiento de un sistema de barras. Skeleton construction: How does it work? Historical evolution of skeleton construction. Load-bearing wall construction Vs. skeleton construction: architectural and spatial implications. Skeleton construction and partitions: arrangement, distribution, connections.
Los materiales en los sistemas porticados Materials for skeleton construction	Estudio comparado de los materiales conformadores de sistemas de pórticos. Comportamiento general de la estructura: características diferenciadoras. Diferencias de comportamiento ante acciones gravitatorias, temperatura, humedad, viento, acciones atmosféricas y fuego. La normativa de los diferentes materiales. Comparative analysis of materials for skeleton construction. Performance and distinguishing features of the structures. Differences in performance under dead and live loads, wind loads, temperature, humidity, weather and fire. Building regulations and codes for different materials.
La construcción metálica Generalidades Metal construction and steel structures. General principles.	Evolución histórica: Las primeras aplicaciones. La nueva estética. Características espaciales. Tipologías constructivas. Tendencias actuales en los usos del acero. Ejemplos de arquitectura en construcción metálica. Origins and evolution of the steel structures. Construction principles. Spatial qualities. Current trends and built examples.

Los materiales: tipos, propiedades y comportamiento Materials: Types, properties, performance.	Propiedades de los metales. El hierro y el acero. Clasificación de los materiales férreos. Fundición, acero y hierro dulce. Tipos de acero. Características, formas comerciales, semiproductos y elaborados. Aceros especiales, inoxidables, al cromo y al níquel. Comportamiento de los aceros. Revestimientos metálicos y revestimientos no metálicos. El cobre. Aleaciones. El plomo. El cinc. El estaño. Aleaciones ligeras. Los perfiles. Las chapas. Mallas metálicas. Religas o entramados metálicos. Perfilados especiales. Alambres y cables. Ferrous metals (types, properties and performance): Cast iron, wrought iron, carbon steel (mild steel, etc), alloy steel (stainless steel, etc). Structural steel grades. Copper, Lead, Zinc, Tin, aluminium and other light alloys. Protective metallic coatings (hot dip galvanizing, anodizing, etc) and non-metallic coatings.
Seguridad y mantenimiento Safety and maintenance	Propiedades de los metales. El hierro y el acero. Clasificación de los materiales férreos. Fundición, acero y hierro dulce. Tipos de acero. Características, formas comerciales, semiproductos y elaborados. Aceros especiales, inoxidables, al cromo y al níquel. Comportamiento de los aceros. Revestimientos metálicos y revestimientos no metálicos. El cobre. Aleaciones. El plomo. El cinc. El estaño. Aleaciones ligeras. Los perfiles. Las chapas. Mallas metálicas. Religas o entramados metálicos. Perfilados especiales. Alambres y cables. Ferrous metals (types, properties and performance): Cast iron, wrought iron, carbon steel (mild steel, etc), alloy steel (stainless steel, etc). Structural steel grades. Copper, Lead, Zinc, Tin, aluminium and other light alloys. Protective metallic coatings (hot dip galvanizing, anodizing, etc) and non-metallic coatings.
Las uniones en la construcción metálica Design of joints in steel structures	El roblonado. Los remaches. Los tornillos. La soldadura. Control. Los apoyos. Tipos y resolución constructiva. Diseño de uniones. Connections made with rivets or bolts. Welded connections. Types of connections: framed connections and rigid connections.
La construcción de estructuras metálicas Construction of steel structures.	Cimentaciones y anclajes. Tipos y resolución constructiva. Placas de anclaje. Sistemas porticados. Barras y soportes metálicos. Tipos y características. Vigas metálicas. Tipos y comportamiento. Los nudos y empalmes. Arriostramientos. Rigidizadores. Juntas de dilatación. Entramados horizontales, forjados de edificación. Tipos y disposiciones constructivas. Enlaces con las vigas y los soportes. Los huecos. Las escaleras y rampas. Tipos y disposiciones constructivas. Elementos estructurales mixtos de acero y hormigón. Las tensoestructuras. Los cables como elemento estructural. Las vigas funiculares. Foundations and base plates. Post-and-beam construction. Connections. Braces. Stiffeners. Expansion joints. Decks and slabs. Stairs and ramps. Composite structures of steel and concrete. Tensile structures. Wire ropes, funicular structures.
Las cubiertas en la construcción metálica Roofs in steel buildings.	Vigas trianguladas. Tipos y resolución constructiva. Los apoyos de las cerchas. Correas. Encuentros. Formas de cubier-tas. Mallas espaciales. Bóvedas y cúpulas. Chapas y paneles de cubrición. Par galvánico. Dilataciones. Aplicaciones concretas. Roof types and shapes. Trusses and trussed beams. Rafters and purlins. Joints and connections. Space frames. Vaults and domes. Roofing: sheet metal and panels. Galvanic corrosion. Thermal expansion.

Pequeños sistemas de barras en arquitectura Other metallic components and assemblies	Fachadas. Funciones. Soluciones de anclaje. Fachadas ligeras. Elementos practicables en fachadas. Ventanas. Clasificaciones. Persianas. Cierres. Puertas. Herrajes de cuelgue y de seguridad. Acristalamiento. Normativa. Sellado. Barandillas, rejas y defensas. Exterior walls, curtain walls, windows, doors, louvers and shutter blinds. Fences and railings.
La construcción en madera La madera en la historia Timber construction. Historic context.	Orígenes. Roma. Edad Media. Norte de Europa. Principios científicos de las estructuras de madera. Estados Unidos: el «balloon frame». Origins and evolution of timber construction. Rome. Medieval Period. Timber tradition in Northern Europe. Timber and building science. Development of the balloon framing in the USA. Current trends and built examples.
El material Timber as as building material.	Características. Aplicaciones. Especificidad de usos. Clasificación. Dureza y resistencia. The anatomy of wood. Species of woods: hardwoods and softwoods. Main uses. Hardness, strength and resistance.
Propiedades de la madera Properties and performance of timber.	Estructuras macroscópica y microscópica. Propiedades físicas y mecánicas. Physical and mechanical properties.
Elementos de construcción Products and building components	Los tableros de madera. La madera maciza. La madera laminada. Los derivados de madera. Las ventanas. Caracterísi-cas y diseño. Acristalamientos. Acabados. Las puertas. Estructuras tipo. Solid timber, glued-laminated timber (glulam), solid wood products, wood-based products (plywood, OSB, particleboards, fibreboards, hardboards). Doors and windows.
Uniones Timber connections.	Uniones de elementos de madera. Ensambles y empalmes. Superposición y yuxtaposición. Clavos. Conectores. Colas. La madera laminada. Carpenter connections. Nails, screws, punched metal plate fasteners, Split-ring connectors, glued connections.
Los entramados en madera Types of structural systems.	El concepto de entramado. Pilares y vigas de una sola pieza. Pilares y vigas dobles. Dos entramados: «balloon» y «platform». General principles. Types of structural systems: Log houses, Post and beam, heavy timber framing, light frame construction (balloon frame and platform frame), etc.
Tipos constructivos Construction of timber structures	Pilares y vigas sencillos. Pilares y vigas dobles. Sistemas de entramado. Vigas sencillas. Vigas curvas. Vigas con ten-sores. Vigas trianguladas. Uniones. Disposiciones: radiales, malla 90º, malla 60º. Voladizos y marquesinas. Articula-ciones. Formas espaciales. Single columns and beams. Columns and beams in pairs. Frames. Elementary beams. Curved beams. Tie rod beams. Trusses and trussed beams. Joints and connections. Canopies and cantilever roofs. Space frames.

Empanelados y particiones de entramados estructurales Wood panels. Exterior walls and partition walls	Principios constructivos. Sistemas portantes en la construcción de paneles. Elementos prefabricados panelizados. Construction principles. Structural wood panels: Cross-Laminated Timber (CLT), Structural insulated panels (SIP), etc. Wall assemblies.
Patología y terapéutica de la madera Pathology and remedial works of timber construction.	Agentes deterioradores bióticos y abióticos. Tratamientos superficiales y profundos. Agents of deterioration: Biotic and abiotic hazards. Wood preservatives: types of treatments and application processes.

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A12 A17 A18 A20 A25 A26 A27 A31 A32 A63 B1 B2 B3 B4 B5 B6 B7 B9 B10 B11 B12 C1 C3 C4 C5 C6 C7 C8	30	20	50
Workbook	A12 A17 A18 A20 A25 A26 A27 A31 A32 A63 B1 B2 B3 B4 B5 B6 B7 B9 B10 B11 B12 C1 C3 C4 C5 C6 C7 C8	0	5	5
Student portfolio	A12 A17 A18 A20 A25 A26 A27 A31 A32 A63 B1 B2 B3 B4 B5 B6 B7 B9 B10 B11 B12 C1 C3 C4 C5 C6 C7 C8	5	10	15
Objective test	A12 A17 A18 A20 A25 A26 A27 A31 A32 A63 B1 B2 B3 B4 B5 B6 B7 B9 B10 B11 B12 C1 C3 C4 C5 C6 C7 C8	5	0	5
Case study	A12 A17 A18 A20 A25 A26 A27 A31 A32 A63 B1 B2 B3 B4 B5 B6 B7 B9 B10 B11 B12 C1 C3 C4 C5 C6 C7 C8	5	15	20
Supervised projects	A12 A17 A18 A20 A25 A26 A27 A31 A32 A63 B1 B2 B3 B4 B5 B6 B7 B9 B10 B11 B12 C1 C3 C4 C5 C6 C7 C8	25	25	50
Personalized attention		5	0	5

(*)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	SESSIONS MAGISTRALES: Exhibition in the classroom of the corresponding subject of the program. To the start of the session will show the index and the summary of the subject. It will support the explanation with the necessary images and with the diagrams and pictures sinópticos pertinent. At the end of the session will do a summary underlining the most important appearances and will recommend the pertinent complementary readings. The students will collect in a personalised_daily Fascicle comments, notes, references, computer links, web pages, complementary bibliography, catalogues, books, brochures, guides, etc.... Related with each subject of Construction exposed during each one of the educational sessions. The students will have to elaborate a document orderly summary with said references.
Workbook	The students will read -along the course- the books, articles and documentation that indicate them the professors; so that it remain proof of his fulfillment, will present in time and forms the timely summaries of said readings.
Student portfolio	The students will collect on the base of the included Methodologies in the subject (sessions magistrales, readings, study of cases and works tutelados) in a Portafolio_personalised_daily FASCICLE comments, notes, references, computer links, web pages, complementary bibliography, catalogues, books, brochures, guides, etc.... Related with each subject of Construction exposed during each one of the educational sessions. The students will have to elaborate a document orderly summary with said references that has to present to previous evaluation obligatoriamente before the Objective Proof of the subject.
Objective test	It will consist in an examination written on the theoretical contents of the subject. In said proof will include a question of practical type related with appearances already studied in the development of the constructive analysis of each one of the buildings proposed for his study in the works tutelados. Previously to the realisation of the Proba obxetiva, obligatoriamente the students will deliver the document summary in physical version and computing of the daily_Fascicle customised of the matter collecting comments, notes, references, computer links, web pages, complementary bibliography, catalogues, books, brochures, guides, etc.... Related with each subject of Construction exposed during each one of the educational sessions.
Case study	They will make studies of real Architectures built by means of a programming of visits of work where know, measure, analyse, investigate and even know direct explanations of the authors of Architectures of recognised quality and intensity propositiva. The students will make a constructive architectural study with individual drawings of the generality of each building detailing material elements and constructive systems more significant. It will study the possibility of realisation of Studies of cases on construction and repair/rehabilitation of works and concrete buildings in collaboration with service of Infrastructures and Edificación of the own University The realisation and delivery of these analyses is compulsory and of PREVIOUS and conjoint evaluation with objective Proof and Works tutelados.

Supervised projects	The Practices of Works tutelados of the subject will make in: 1º- CLASSROOM and 2º- WORKSHOP on architectural SUBJECT of study previously agreed before the start of the academic course and shared with other subjects: Projects + Urbanismo + Construction. You PRACTISE them of CLASSROOM correspond exclusively to the subject: Construction 3; you PRACTISE them of WORKSHOP will share partially the teaching with the pertaining professors to the areas of knowledge that are integrated in the Workshop shared of the course and cuatrimestre corresponding. The hours of teaching, total, of the Practices of Classroom will be: 45. The hours of teaching, total, of the Practices of Workshop will be: 15. It PRACTISES CLASSROOM: it PRACTISES It of CLASSROOM will consist in the realisation of a work to develop during the course. The delivery and realisation of the practical will be individual. The practice will consist in the constructive analysis of 2 buildings: one with structure and construction fundamentally of metal/steel, another with structure and construction fundamentally wooden. The buildings are selected to principle of course between works of architects of recognised prestige. It will contribute the necessary biography that will remain reserved in the library for query of the students. Besides, it will deposit the available documentation in computer support, in the classroom of Computing of the ETSAC. They will make two deliveries and in addition to a final, summary of the works made along the course and that collect the corrections indicated by each professor. For each building, one of metal and another wooden, simultaneously will make the following deliveries: First delivery. The first part of the work consists in the graphic analysis of the architecture of the building proposed. They will draw the plants, heaved, a longitudinal vertical section and a transversal to a pertinent scale. The plants will be limited and will include necessarily the plant of covers. They will deliver likewise the plants detailed and limited of the structure of the building to a scale 1/50, properly entitled and with the specification of each structural element. They will present likewise the constructive details of the structure that each professor estimate pertinent. The maximum extension a fold in format A1. This delivery also will make by computer means in the platform Moodle, in accordance with the characteristics that in said application indicate . Second delivery. It will consist of a rigid signpost format A1, form by both faces that contain a vertical section of the building determined by each professor for each student- as well as a horizontal section by a corner and a gap of façade, to a scale 1/10 or 1/5. They will appoint each one of the constructive elements as well as his parts and will specify pormenorizadamente in the pictures of pertinent characteristics. The signpost will have to include likewise, the most notable of the previous delivery. This delivery also will make by computer means in the platform Moodle, in accordance with the characteristics that in said application indicate . Final delivery. The final delivery will consist in signposts with format A1 that include the corrections made by the professor, form by both faces that contain a vertical section of the building ?determined by each professor for each student- as well as a horizontal section by a corner and a gap of façade, to a scale 1/20 1/10 or 1/5. It will appoint each one of the constructive elements as well as his parts and will specify pormenorizadamente in the pictures of pertinent characteristics. The signpost will have to include likewise, the most notable of the previous deliveries with the owed corrections. This delivery also will make by computer means in the platform Moodle, in accordance with the characteristics that in said application indicate . It PRACTISES WORKSHOP: The Practice of Workshop shared will consist in the study of the Subject of architectural investigation consensuado with the included subjects in workshop cuatrimestral (Projects + Urbanismo + Construction) elaborating the pertinent constructive proposal of analysis and definition of architecture, his materialisation and proposal reasoned of general constructive system. The dates of delivery as well as the documentation to present will govern by the agreed conditions/coordinated between the

subjects of the Workshop. For the area of Architectural Constructions, the delivery will consist in two pliegos A1, delivered folded in size A4, in which it collect : heaved, plants and sections of the project; plants and sections of the structure; planes of plant+heaved+sections of materials #finish; and constructive proposal of architectural systems and details more notable of the study and possible architecture projected by the student.

This delivery also will make by computer means in the platform Moodle, in accordance with the characteristics that in said application indicate .

Personalized attention	
Methodologies	**Description**
Objective test Supervised projects Case study	The importance of the personalised attention is consequence of the educational aims of the subject that do not consist so only in informár or communicate some more or less objective contents, but form: develop skills, ways to confront with the problems, stimulate the creativity, the critical spirit, etc. The personalised attention to the student will make in the workshops and by means of personal interviews with the professor. In the workshops, will explain the distinct appearances of the practice in group for the students of the group, but will correct and will explain to each student his particular work. After each objective proof will receive to the students that wish it with the end to comment the appearances of the examination that estimate timely.

Assessment			
Methodologies	**Competencies / Results**	**Description**	**Qualification**
Workbook	A12 A17 A18 A20 A25 A26 A27 A31 A32 A63 B1 B2 B3 B4 B5 B6 B7 B9 B10 B11 B12 C1 C3 C4 C5 C6 C7 C8	The students will read -along the course- the books, articles and documentation that indicate them the professors; so that it remain proof of his fulfillment, will present in time and forms the timely summaries of said readings. The summaries will have to include in the Portafolio_Daily_FASCICLE customised of the matter. The no presentation of the mentioned summaries will suppose the consideration of the student as NO PRESENTED.	1

Objective test	A12 A17 A18 A20 A25 A26 A27 A31 A32 A63 B1 B2 B3 B4 B5 B6 B7 B9 B10 B11 B12 C1 C3 C4 C5 C6 C7 C8	The contents of the subject will expose fundamentally in classes of the type session magistral; the evaluation of the assimilation by the student of said contents will make by means of an objective Proof. Previously to the realisation of the objective Proof, obligatoriamente the students will deliver the documents summary in physical and computer version of: I- Portafolio_daily_FASCICLE customised of the matter collecting comments, notes, references, computer links, web pages, complementary bibliography, catalogues, books, brochures, guides, etc.... Related with each subject of Construction exposed during each one of the educational sessions. II-Study of CASES Architectures, constructive architectural study with individual drawings of the generality of each building detailing material elements and constructive systems more significant. They will make studies of real Architectures built by means of a programming of visits of work where know, measure, analyse, investigate and even know direct explanations of the authors of Architectures of recognised quality and intensity propositiva. The realisation and delivery of these analyses is compulsory and of previous and conjoint evaluation with objective Proof and Works tutelados. To obtain the credits of the subject is indispensable to present to all the proofs of evaluation and will obtain an equal half note or upper to the 5 points on 10; if in some part of the subject did not obtain a qualification of at least 4 points the student will consider no apt, although the global average of the qualifications was upper or the same to the 5 points. ponderará The regularity, the progression and the balanced acquisition of practical knowledges and theorists by part of the student. It will demand a minimum ASSISTANCE of 85% to be able to present to the objective proof. It will control by means of signatures in listing of official students in each session, to be able to present to the objective proof. The incumplimiento of assistance will suppose the qualification of NO PRESENTED. The evaluation of knowledges shared in the present methodology makes jointly in the objective Proof. To obtain the credits of the subject is indispensable to present to all the proofs of evaluation and will obtain an equal half note or upper to the 5 points on 10; if in some part of the subject did not obtain a qualification of at least 4 points the student will consider no apt, although the global average of the qualifications was upper or the same to the 5 points. ponderará The regularity, the progression and the balanced acquisition of practical knowledges and theorists by part of the student. FIRST OPPORTUNITY: At the end of the cuatrimestre will make a final examination on the contents explained during the development of the same: Metal and Wood. The note obtained will suppose 30% of the final note delivered in 25% Examination + 2% daily Fascicle portfolio + 2% Study Cases Architectures +1% Fascicle Readings In these examinations will include a question of practical type related with appearances already studied in the development of the constructive analysis of each one of the buildings proposed for his study in the Practice of Classroom. To the student that approve this Theoretical part in the opportunity of June, will

conserve him the qualification until following opportunity of Julio.

SECOND OPPORTUNITY: If the student does not approve the subject at the earliest opportunity, will make a proof of the same characteristics and with the same coefficient of weighting in the final note that the made at the earliest opportunity.

The reviews of the examinations will effect in the schedule that fix the professors of the subject. They will announce with the sufficient antelación in the bulletin board of the Department. Along the course will inform periodically to the student of the results of the proofs made.

Guest lecture / keynote speech	A12 A17 A18 A20 A25 A26 A27 A31 A32 A63 B1 B2 B3 B4 B5 B6 B7 B9 B10 B11 B12 C1 C3 C4 C5 C6 C7 C8	The contents of the subject will expose fundamentally in classes of the type session magistral; the evaluation of the assimilation by the student of said contents will make by means of an objective Proof. Previously to the realisation of the objective Proof, obligatoriamente the students will deliver the documents summary in physical and computer version of: I- Portafolio_daily_FASCICLE customised of the matter collecting comments, notes, references, computer links, web pages, complementary bibliography, catalogues, books, brochures, guides, etc.... Related with each subject of Construction exposed during each one of the educational sessions. II-Study of CASES Architectures, constructive architectural study with individual drawings of the generality of each building detailing material elements and constructive systems more significant. They will make studies of real Architectures built by means of a programming of visits of work where know, measure, analyse, investigate and even know direct explanations of the authors of Architectures of recognised quality and intensity propositiva. The realisation and delivery of these analyses is compulsory and of previous and conjoint evaluation with objective Proof and Works tutelados. To obtain the credits of the subject is indispensable to present to all the proofs of evaluation and will obtain an equal half note or upper to the 5 points on 10; if in some part of the subject did not obtain a qualification of at least 4 points the student will consider no apt, although the global average of the qualifications was upper or the same to the 5 points. ponderará The regularity, the progression and the balanced acquisition of practical knowledges and theorists by part of the student. It will demand a minimum ASSISTANCE of 85% to be able to present to the objective proof. It will control by means of signatures in listing of official students in each session, to be able to present to the objective proof. The incumplimiento of assistance will suppose the qualification of NO PRESENTED. The evaluation of knowledges shared in the present methodology makes jointly in the objective Proof.	1

Supervised projects	A12 A17 A18 A20 A25 A26 A27 A31 A32 A63 B1 B2 B3 B4 B5 B6 B7 B9 B10 B11 B12 C1 C3 C4 C5 C6 C7 C8	FIRST OPPORTUNITY: To surpass the practical part of the subject -Practical of Classroom and Practical of Workshop shared- the students will have to effect on time all the planned deliveries along the course; they will have to present the last delivery with the corrections indicated by the professor; and they will have to obtain at least a qualification of 5 points on 10. The note of the Practice of CLASSROOM and the note of the Practice of Workshop will suppose 65% of the total note final of the subject, with 60% and 5% respectively. To this note will have to add the note of Studies of Architectures (cases) that supposes 5% of the total note final of the subject, resulting 70% of the total of the subject. The no presentation of the mentioned practical works will suppose the consideration of the student as no presented. It will demand a minimum assistance of 85% to be able to present to the Practical part of Classroom and the Practical part of Workshop shared the subject. The no total or partial presentation of the exercises of Practice of Classroom and Practical of Workshop shared will suppose the qualification of NO PRESENTED. To the student that approve this part Practises in the opportunity of January, will conserve him the qualification until following opportunity of Julio. SECOND OPPORTUNITY: If the student does not approve the subject at the earliest opportunity, will present in the date fixed the same works demanded at the earliest opportunity incorporating the corrections and distinguished indications by the professor. It will value with the same coefficient of weighting in the final note that the made at the earliest opportunity. The reviews of the examinations will effect in the schedule that fix the professors of the subject. They will announce with the sufficient antelación in the bulletin board of the Department. Along the course will inform periodically to the student of the results of the proofs made.	70

Student portfolio	A12 A17 A18 A20 A25 A26 A27 A31 A32 A63 B1 B2 B3 B4 B5 B6 B7 B9 B10 B11 B12 C1 C3 C4 C5 C6 C7 C8	The students will collect on the base of the included Methodologies in the subject (sessions magistrales, readings, study of cases and works tutelados) in a Portafolio_personalised_Daily FASCICLE comments, notes, references, computer links, web pages, complementary bibliography, catalogues, books, brochures, guides, etc.... Related with each subject of Construction exposed during each one of the educational sessions. The students will have to elaborate a document orderly summary with said references that has to present to previous evaluation obligatoriamente before the Objective Proof of the subject. FIRST OPPORTUNITY: To surpass the part of Portafolio_Daily_FASCICLE, the students will have to effect on time the final delivery foreseen of the course; they will have to present the last delivery with the corrections indicated by the professor; and they will have to obtain at least a qualification of 5 points on 10. It will demand a minimum assistance of 85% to be able to present to the part Portafolio_Daily_FASCICLE of the subject. The no total or partial presentation of the exercises of Portafolio_Daily_FASCICLE will suppose the qualification of NO PRESENTED. To the student that approve this part of Portafolio_Daily_FASCICLE in the opportunity of June, will conserve him the qualification until following opportunity of Julio. SECOND OPPORTUNITY: If the student does not approve the subject at the earliest opportunity, will make a proof of the same characteristics and with the same coefficient of weighting in the final note that the made at the earliest opportunity. The reviews of the examinations will effect in the schedule that fix the professors of the subject. They will announce with the sufficient antelación in the bulletin board of the Department.	2

Case study	A12 A17 A18 A20 A25 A26 A27 A31 A32 A63 B1 B2 B3 B4 B5 B6 B7 B9 B10 B11 B12 C1 C3 C4 C5 C6 C7 C8	They will make studies of real Architectures built by means of a programming of visits of work where know, measure, analyse, investigate and even know direct explanations of the authors of Architectures of recognised quality and intensity propositiva. The students will make a Study of CASES Architectures, constructive architectural study with individual drawings of the generality of each building detailing material elements and constructive systems more significant. The realisation and delivery of these analyses is compulsory and of previous and conjoint evaluation with objective Proof and Works tutelados. FIRST OPPORTUNITY: To surpass the part of Studies of CASES Architectures, the students will have to effect on time all the planned deliveries along the course; they will have to present the last delivery with the corrections indicated by the professor; and they will have to obtain at least a qualification of 5 points on 10. The note of Studies of Architectures (cases) will suppose 3% of the total note final of the subject, in the section of the practical part of the evaluation and will add to 60% corresponding to the evaluation of Works tutelados, resulting 70% of the total of the subject. To obtain the credits of the subject is indispensable to present to all the proofs of Evaluation and will obtain an equal half note or upper to the 5 points on 10; if in some part of the subject did not obtain a qualification of at least 4 points the student will consider no apt, although the global average of the qualifications was upper or the same to the 5 points. ponderará The regularity, the progression and the balanced acquisition of practical knowledges and theorists by part of the student. It will demand a minimum assistance of 85% to be able to present to splits it Studies of Architectures (cases) of the subject. The no total or partial presentation of the exercises of Studies of Architectures (cases) will suppose the qualification of NO PRESENTED. To the student that approve this part of Studies of Architectures (cases) in the opportunity of January, will conserve him the qualification until following opportunity of Julio. SECOND OPPORTUNITY: If the student does not approve the subject at the earliest opportunity, will make a proof of the same characteristics and with the same coefficient of weighting in the final note that the made at the earliest opportunity. The reviews of the examinations will effect in the schedule that fix the professors of the subject. They will announce with the sufficient antelación in the bulletin board of the Department.	1

Assessment comments

The criteria of evaluation and recovery in the Second Opportunity, so much for objective Proof like Works tutelados, will have the same coefficients of weighting and identical requirement of minimum qualification of 5 points on 10, that the distinguished for the First Opportunity.
Measures of dedication for the students part time: they do not contemplate , due to the fact that it treats of a matter in which the Works tutelados, Study of cases and Workshop are fundamental methodologies.
It dispenses academic: it does not contemplate , for being a matter in which the Works tutelados, Study of cases and Workshop are fundamental methodologies.
The detection of plagiarism, as well as the fraudulent realisation of proofs or activities of evaluation, once checked, will involve directly the qualification of suspense ?0? in the matter in the corresponding announcement, invalidating like this any qualification obtained in all the activities of evaluation of face to the extraordinary announcement

Sources of information

Basic	CTE_CÓDIGO TÉCNICO DE LA EDIFICACIÓNDB-SI - SEGURIDAD EN CASO DE INCENDIODB-SU ? SEGURIDAD DE UTILIZACIÓNSE ? BASES DE CÁLCULOSE-AE ? ACCIONES EN LA EDIFICACIÓNSE-C ? CIMIENTOSSE-A ? ACEROSE-F ? FÁBRICASE-M ? MADERADB-HS ? SALUBRIDADDB-HE ? AHORRO DE ENERGÍADB-HR - PROTECCIÓN FRENTE AL RUÍDOFICHAS TÉCNICAS DEL COAG; EXIGENCIAS MÍNIMAS EN EL DISEÑO DE EDIFICIOS DE VIVIENDAS EN GALICIA (adaptadas al Código Técnico dela Edificación RD314/2006), ed. COAG, Santiago de Compostela 2007Instrucción del hormigón estructural EHE-98, Ministerio de Fomento, Madrid, 1998.Eurocódigo 2: proyecto de estructuras de hormigón, AENOR, Madrid, [1993-2000].Instrucción para el proyecto y la ejecución de forjados unidireccionales de hormigón estructural realizados con elementos prefabricados (EFHE-02). 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A./Lozano Apolo, G., «Curso de técnicas de intervención en el patrimonio arquitectónico» (2 vol.), CTC, Gijón, 1995.Sánchez Mazaira, A., «La madera laminada encolada», Fundación Escuela de Edificación, Madrid, 1992.También puede consultarse la revista «Protecma» (www.esinal.es/protecma).

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Recommendations
Subjects that it is recommended to have taken before
Introduction to Architecture/630G02005
Drawing in Architecture/630G02002
Analysis of Architectural Forms/630G02007
Construction 2/630G02020
Construction 1/630G02010
Architectural Design 2/630G02006
Architectural Design 3/630G02011
Structures 1/630G02019
Structures 2/630G02023
Architectural Design 1/630G02001
Subjects that are recommended to be taken simultaneously
Construction 4/630G02027
Systems 2/630G02039
Structures 3/630G02028
Architectural Design 4/630G02016
Architectural Design 3/630G02011
History of Architecture 1/630G02035
Subjects that continue the syllabus
Construction 4/630G02027
Construction 6/630G02037
Construction 7/630G02045
Construction 5/630G02033
Other comments
To docencia to students of programs of mobility will adapt the pedagogical conditions and of works tutelados special, as well as the proofs and examinations of evaluation. As it collects in the distinct rules of application for it docencia university, incorporated the perspective of gender in this subject. It Will work to identify and modify prejudices, attitudes sexistas and situations of discrimination by reason of gender. They Will propose actions and measures to correct them and will promote values of respect and equality.

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