UNIVERSIDADE DA CORUÑA

Teaching Guide				
Identifying Data				2020/21
Subject (*)	Digital Graphic Tools for Building		Code	670G01109
Study programme	Grao en Arquitectura Técnica			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	2nd four-month period	First	Basic training	6
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Expresión Gráfica Arquitectónica			
Coordinador	Fernández Álvarez, Ángel José	E-mail	angel.fernandez.alvarez@udc.es	
Lecturers	Fernández Álvarez, Ángel José López Chao, Vicente Adrián	E-mail	angel.fernandez.alvarez@udc.es v.lchao@udc.es	
Web	https://euat.udc.es/es/			
General description	This course provides the basic knowledge for the student to start using various digital graphic tools in buildings. In combination with the subjects Architectural Graphic Expression I and Descriptive and Representation Geometry, it is intended to work productively on the graphic representation of building elements. This course focuses on optimal and effective representation using the digital graphic tools used in the professional field.			

Contingency plan	NON-ATTENDANCE TEACHING METHOD ACTIONS COVID-19 1. Modifications to the contents No changes will be made. 2. Methodologies *Teaching methodologies that are maintained The methodologies proposed in the guide will be adapted to the new situation of exceptionality through the use of the institutional telematic tools for teamwork available for conducting online seminars, as well as the use of the Moodle platform (Virtual Campus) and the use of the email. *Teaching methodologies that are modified Lectures are replaced by online seminars (Microsoft Teams) with a more flexible and dynamic format with the possibility of student participation and resolution of doubts. This teaching will be adapted to the new situation of exceptionality through the use of the Moodle platform (Virtual Campus) and the use of e-mail. The follow-up and review of the supervised work of the subject will be carried out through some telematic teamwork platform (Teams) organizing the activity in combination with the Moodle platform of the subject (Virtual Campus) and the UDC e-mail. 3. Mechanisms for personalized attention to students Personalized attention will preferably be provided via the UDC e-mail, although the available institutional telematics tools for teamwork may also be used. All the information on the subject in this period of non-contact teaching (activities, deliveries, evaluation, tutorial attention, ...) will be done through the Moodle platform of the subject (Virtual Campus) so it is recommended to consult it frequently by students. 4. Modifications in the evaluation Methodology: Tutored works. Rating weight: 100%. Description: Preparation of tutored practical works related to the contents of the subject. * Evaluation observations: The teaching of the Digital Graphic Tools for Building subject is based on an active learning methodology that includes pedagogical approaches such as Project Based Learning and Problem Based Learning, through a continuous evaluation system and with the obligation of active participation by the students. . Each task / practical work will be carried out individually and those works that reach a minimum score of 5 out of 10 will be considered FIT. To pass the subject, it is necessary to correctly carry out ALL the proposed works as well as to properly follow them in the practical class (workshop) and tutorials. In addition to the attendance, participation and completion of tasks / assignments, the tests deemed necessary may be carried out in order to adequately assess the degree of assimilation of the conceptual and procedural contents of the subject. To pass the course PER COURSE, the student must deliver ALL the works proposed in the manner and term indicated at the beginning of the teaching period and each of the works must have been qualified as PASSED. Students who do not pass the subject per course must deliver the corresponding works on the date set for the First Assessment Opportunity (MAY / JUNE) or, where appropriate, on the date set for the Second Assessment Opportunity (JULY). In these deliveries, the corresponding indications of the teachers responsible for the subject must be followed MANDATORYLY. In order to be evaluated in the First and Second Opportunities, it is considered MANDATORY to have followed up the work

to be delivered, being the responsibility of the student the active participation in the tutorials.

IMPORTANT: The student who does not deliver any of the proposed works in time and form will have the condition of NOT PRESENTED. It will not be allowed to complete or modify the works outside the indicated delivery dates.

The practices will be delivered electronically via the subject's Moodle platform (Virtual Campus). In these deliveries, the corresponding indications of the teachers responsible for the subject must be followed MANDATORYLY.

5. Modifications to the bibliography or webgraphy

The sources of basic and complementary information reflected in the teaching guide are maintained as students have at their disposal both on the Moodle platform of the subject (virtual campus) and on the web (online resources) all the necessary and sufficient documentation to the adequate study of the contents of the subject.

Study programme competences / results	
Code	Study programme competences / results
A38	A0.3 Ability to use spatial representation systems, sketching, dimensioning, and graphical representation language and techniques for building elements and processes.
A45	A1.2 Understanding of architectural infographics and construction mapping methods and techniques.
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.
B12	Razoamento crítico.
B14	Aprendizaxe autónomo.
B16	Capacidade de aplicar os coñecementos na práctica.
B25	Hábito de estudo e método de traballo.
B27	Capacidade de comunicación a través da palabra e da imaxe.
B31	B1 Students will demonstrate knowledge and understanding of subjects that build upon the foundation of a general secondary education using advanced textbooks and ideas and analyses from the cutting edge of their field.
B32	B2 Students will be able to use their knowledge professionally and will possess the skills required to formulate and defend arguments and solve problems within their area of study.
B33	B3 Students will have the ability to gather and interpret relevant data (especially within their field of study) in order to make decisions and reflect on social, scientific and ethical matters.
B34	B4 Students will be able to communicate information, ideas, problems and solutions to specialist and non-specialist audiences alike.
B35	B5 Students will develop the learning skills and autonomy they need to continue their studies at postgraduate level.
C1	Adequate oral and written expression in the official languages.
C3	Using ICT in working contexts and lifelong learning.
C4	Acting as a respectful citizen according to democratic cultures and human rights and with a gender perspective.
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		
To know the infographic procedures and methods used in the field of construction.	A38	B3	C1
	A45	B4	C3
		B5	C4
		B12	C6
		B14	C7
		B31	C8
		B32	
		B33	
		B34	
		B35	

To acquire 2D and 3D drawing skills through graphic computer systems and software as a communication and representation tool in the field of construction.	A38 A45	B1 B3 B4 B5 B12 B14 B16 B25 B31 B32 B33 B34 B35	C1 C3 C4 C6 C7 C8
To apply computer graphics procedures to the representation of objects and spaces.	A38 A45	B1 B3 B4 B5 B12 B14 B16 B31 B32 B33 B34 B35	C1 C3 C4 C6 C7 C8
To conceive and represent the visual attributes of objects through the computer techniques of drawing.	A38 A45	B1 B5 B12 B14 B16 B25 B31 B32 B33 B34 B35	C1 C3 C4 C6 C7 C8
To acquire the knowledge applied to the construction of spatial representation systems, formal analysis and the laws of visual perception through tools, procedures and infographic methods.	A38 A45	B1 B3 B4 B5 B12 B14 B16 B25 B31 B32 B33 B34 B35	C1 C3 C4 C6 C7 C8

To apply advanced systems of representation and graphic communication to building processes.	A38 A45	B1 B3 B4 B5 B12 B14 B16 B25 B27 B31 B32 B33 B34 B35	C1 C3 C4 C6 C7 C8

Contents	
Topic	**Sub-topic**
Introduction to Computer Aided Design (CAD).	Fundamentals of 2D and 3D digital graphic representation. Graphical environment interface. Basic properties. Commands and operations. Drawing editing and management tools. Texts. Dimensions. Presentation and layout.
Introduction to 3D modeling.	Primitive. Boolean operations. Solid modeling. Surface modeling and architectural and construction geometries.
Introduction to 3D infographics.	Visualization and virtualization. Rendering.
Introduction to BIM methodology(Building Information Modeling).	Contextualization. Work environment. Interface. Basic modeling. Annotation, measurement and layout. Rendering.
Introduction to digital image processing.	Basic concepts of digital image editing: bitmap and vector design.

Planning				
Methodologies / tests	**Competencies / Results**	**Teaching hours (in-person & virtual)**	**Student?s personal work hours**	**Total hours**
Guest lecture / keynote speech	A45 B1 B3 B12 B14 B25 B27 B31 B33 B35 C1 C4 C6 C7 C8	15	10	25
Problem solving	A38 A45 B1 B4 B5 B12 B14 B16 B31 B32 B33 C3	5	10	15
ICT practicals	A38 A45 B1 B4 B5 B12 B14 B16 B25 B33 B34 C3 C8	5	8	13
Workshop	A38 A45 B1 B3 B4 B5 B16 B25 B32 C3 C4 C7	30	20	50
Supervised projects	A38 A45 B1 B3 B4 B5 B12 B14 B16 B25 B27 B32 B33 B34 C1 C3 C8	0	30	30
Student portfolio	A45 B1 B3 B12 B14 B25 B27 B33 B34 C1 C3 C8	0	5	5

Objective test	A38 A45 B1 B3 B4 B5 B12 B16 B31 B32 C3	5	0	5
Document analysis	A38 A45 B1 B3 B12 B14 B25 B33 C3 C8	0	5	5
Personalized attention		2	0	2
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	**Description**
Guest lecture / keynote speech	The teacher gives an educational talk to the students concerning the course contents, supported by audiovisual media. Also, issues are debated with the students in order to facilitate learning. This methodology may be complemented with other types of training activities such as conferences, presentations, talks, visits, etc.
Problem solving	Students must solve a specific problem situation based on the knowledge that has been worked on, which may have more than one possible solution.
ICT practicals	Students will carry out practices in which their knowledge of digital graphic tools will be demonstrated.
Workshop	This methodology is based on interactive teaching, a pedagogical model focused on applying the theoretical content. The workshop can encompass various methodologies such as exhibitions, simulations, debates, problem solving, guided practices, etc., that guide the student's work on a certain subject, with the support and supervision of the teaching staff.
Supervised projects	This methodology aims to promote the autonomous learning of students under the support of teachers in both academic and professional settings. It refers to learning "how to do things", and in which the student assumes responsibility for their training.
Student portfolio	It consists of the collection of data that the student prepares from the theoretical sessions (expository) and from his personal reflections on the proposed work: graphic data, images, drawings, bibliographic references, technical documentation and notes related to the development of each one of the proposed exercises.
Objective test	Tests deemed necessary may be carried out in order to adequately assess the degree of assimilation of the conceptual and procedural content of the course. These tests may have a varied format and adapted to the specific characteristics of the contents.
Document analysis	The student will analyze documentary sources related to the proposed topic through the use of audiovisual, bibliographic documents, documentary reports, graphic panels, photographs, models, papers, informative texts, regulations, etc. Individually or in workshop groups, the available documentation is analyzed and expanded, preparing a synthesis of the different documentary sources.

Personalized attention	
Methodologies	**Description**
Workshop Supervised projects Student portfolio	Teachers will simultaneously monitor the group collectively with each student to ensure the correct evolution of the individual project process. The needs of the students related to the study and / or topics related to the subject will be attended, providing guidance, support and motivation in the teaching / learning process.

Assessment			
Methodologies	**Competencies / Results**	**Description**	**Qualification**
Supervised projects	A38 A45 B1 B3 B4 B5 B12 B14 B16 B25 B27 B32 B33 B34 C1 C3 C8	The elaboration of practical works related to the contents of the subject will be proposed. At the beginning of the semester, students will be notified of the number of assignments, their characteristics and the corresponding delivery dates.	70
Student portfolio	A45 B1 B3 B12 B14 B25 B27 B33 B34 C1 C3 C8	This section considers the monitoring of data collection and information management concerning the student work, as well as the active participation of students in the practices / activities carried out in the course.	10

ICT practicals	A38 A45 B1 B4 B5 B12 B14 B16 B25 B33 B34 C3 C8	Practices will be developed that demonstrate the use of the digital tools of the course.	10
Objective test	A38 A45 B1 B3 B4 B5 B12 B16 B31 B32 C3	Necessary tests will be performed in order to adequately assess the degree of assimilation of the conceptual and procedural contents of the subject. These tests may have a varied format and adapted to the specific characteristics of the contents.	10

Assessment comments
For the evaluation of the subject, regular attendance is required for both lectures (THEORY) and interactive ones (PRACTICE) with a minimum of 80% attendance in each of them. Any incident related to attendance (family, work, etc.) must be reported to the teacher at the beginning of the semester or at the time it occurs. The teaching method of the course Digital Graphic Tools for Building is based on Project-Based Learning (PBL), which will be evaluated by continuous assessment and with the obligation of active participation by students. Each task will be done individually and will be considered PASSED those works that reach a minimum score of 5 out of 10. It is necessary to properly perform ALL the proposed work as well as proper follow-up in the practice class (workshop) and tutorials to pass the course. In addition to the attendance, participation and carrying out of supervised work, tests may be carried out in order to adequately assess the degree of assimilation of the conceptual and procedural contents of the subject. To pass the subject PER COURSE the student must submit ALL the work in the form and deadline indicated at the beginning of the semester and each of the work must be qualified as PASSED. Students who do not pass the subject per course must submit the corresponding assignments on the date set for the First Assessment Opportunity (JUNE) or, where applicable, on the date set for the Second Assessment Opportunity (JULY). In these deliveries, the corresponding indications of the teacher responsible for the subject MUST be followed. In order to be evaluated in the First and Second Opportunity, it is considered MANDATORY to follow up the work to be delivered, with the student being responsible for active participation in the teacher's supervision. IMPORTANT: The student who is in any of the following circumstances will have the condition of NOT PRESENTED:- One who does not meet the required minimum attendance.- One that does not deliver on time and forms any of the tasks.It will not be allowed to complete or modify the works after the delivery dates.

Sources of information	
Basic	- KREBS, Jan (2007). CAD. Basel: Birkhauser - ELYS, John (2013). Fundamentos del diseño asistido por ordenador (CAD) : en arquitectura. Barcelona: Blume - REYES RODRÍGUEZ, Antonio Manuel (2019). AutoCAD 2019: manual imprescindible. Madrid: Ediciones Anaya - CARRANZA ZAVALA, Óscar (2019). AutoCAD 2019. Barcelona: Marcombo - REYES RODRÍGUEZ, Antonio Manuel; CANDELARIO GARRIDO, Alonso;CORDERO TORRES, Pablo (2016). BIM. Diseño y Gestión de la Construcción. Madrid: Ediciones Anaya - RODRÍGUEZ, Hugo (2020). Guía completa de la Imagen Digital, 5ª ed.. Barcelona: Marcombo - Manuales de usuario y tutoriales del software empleado en la asignatura. (). .
Complementary	- FÉLEZ, J. (Coord.); MARTÍNEZ, M.L.; CABANELLAS, J.M.; CARRETERO, A. (1996). Fundamentos de ingeniería gráfica. Madrid: Síntesis - CHING, D. K. (2015). Architectural graphics. Nueva York: Wiley - McMorrough, Julia (2017). Dibujo para arquitectos : cómo usar la ilustración para explorar conceptos, definir elementos y rediseñar edificios con eficacia. Barcelona: Promopress - MOLL, Ze (2009). Curso de dibujo arquitectónico : [herramientas y técnicas para la representación bidimensional y tridimensional]. Barcelona: Acanto

Recommendations
Subjects that it is recommended to have taken before

Descriptive and Representation Geometry/670G01102 Architectural Graphic Expression I/670G01103
Subjects that are recommended to be taken simultaneously
Descriptive and Representation Geometry/670G01102
Subjects that continue the syllabus
Architectural Graphic Expression II/670G01117
Other comments
It is considered advisable to have a minimum knowledge at user level of the use of computer software (installation of programs, file management, use of operating systems and office tools at user level ...).VERY IMPORTANT: It is recommended to bring a laptop with Internet access to classes.