



## Teaching Guide

| Identifying Data    |  |        |            |   | 2020/21 |
|---------------------|--|--------|------------|---|---------|
| Subject (*)         | Geometry of Illustrations  |        | Code       | 670G01018                                 |         |
| Study programme     | Grao en Arquitectura Técnica   |        |            |   |         |
| Descriptors         |  |        |            |   |         |
| Cycle               | Period   | Year   | Type       | Credits                                   |         |
| Graduate            | 2nd four-month period  | Second | Obligatory | 6   |         |
| Language            | SpanishGalician  |        |            |   |         |
| Teaching method     | Face-to-face   |        |            |   |         |
| Prerequisites       |  |        |            |   |         |
| Department          | Expresión Gráfica Arquitectónica   |        |            |   |         |
| Coordinador         | Pernas Alonso, Maria Ines  |        | E-mail     | ines.alonso@udc.es                        |         |
| Lecturers           | Hermida Gonzalez, Luis<br>Pernas Alonso, Maria Ines  |        | E-mail     | luis.hermida@udc.es<br>ines.alonso@udc.es |         |
| Web                 | euat.udc.es  |        |            |   |         |
| General description | <p>The Geometry of the Representation like continuation of the temario of the asignatura of Descriptive Geometry has like aim the geometrical rationalisation of the space subjects. In the academic field contributes the basic device on which support graphic disciplines more specialised like Architectural Graphic Expression, Topography and Technical Projects, as well as the employment of the Computer-aided Design and the Graphic Computing. It converts like this in the GRAMMAR of the graphic language, being necessary his knowledge to be able to express with correction and efficiency.</p> <p>It contributes to the configuration and rationalisation of a mental model of the reality, what commonly designates SEE IN THE SPACE, although it would be more exact the expression IMAGINE in the space.</p> <p>In the professional field the reading and interpretation of planes is one of the necessary tasks to the hour to execute a project of edificación, having to extract of the graphic documents all the necessary information for the correct execution of the work.</p> <p>In the field of the editorial of technical projects the Geometry of the Representation contributes the training of the necessary space vision for the origin of the final solution that will be three-dimensional and inside the communicative function of the graphic language through planes and croquis, contributes the sustrato theoretical basic of the distinct Systems of Representation perspectivis: axonometría orthogonal, axonometría oblicua and conical perspective.</p> |        |            |   |         |
| Contingency plan    | <ol style="list-style-type: none"> <li>1. Modifications to the contents</li> <li>2. Methodologies <ul style="list-style-type: none"> <li>*Teaching methodologies that are maintained</li> <li>*Teaching methodologies that are modified</li> </ul> </li> <li>3. Mechanisms for personalized attention to students</li> <li>4. Modifications in the evaluation <ul style="list-style-type: none"> <li>*Evaluation observations:</li> </ul> </li> <li>5. Modifications to the bibliography or webgraphy</li> </ol>   |        |            |   |         |

### Study programme competences / results

| Code | Study programme competences / results |
|------|---------------------------------------|
|------|---------------------------------------|



|     |  |
|-----|--|
| A2  | Adquirir os coñecementos fundamentais sobre os sistemas e aplicacións informáticas específicos e xerais utilizados no ámbito da edificación.   |
| A6  | Coñecer e aplicar os distintos sistemas de representación así como as técnicas e procedementos de expresión gráfica aplicados á edificación e ás construcións arquitectónicas.                             |
| 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.   |
| B7  | Capacidade de traballo en equipo.  |
| B8  | Capacidade para traballar nun equipo de carácter interdisciplinario.   |
| B12 | Razoamento crítico.  |
| B14 | Aprendizaxe autónomo.  |
| B16 | Capacidade de aplicar os coñecementos na práctica.   |
| B17 | Creatividade e innovación.   |
| B27 | Capacidade de comunicación a través da palabra e da imaxe.   |
| C1  | Adequate oral and written expression in the official languages.  |
| C3  | Using ICT in working contexts and lifelong learning.   |
| C4  | Acting as a respectful citizen according to democratic cultures and human rights and with a gender perspective.  |
| C5  | Understanding the importance of entrepreneurial culture and the useful means for enterprising people.  |
| C6  | Acquiring skills for healthy lifestyles, and healthy habits and routines.  |
| C7  | Developing the ability to work in interdisciplinary or transdisciplinary teams in order to offer proposals that can contribute to a sustainable environmental, economic, political and social development. |
| C8  | Valuing the importance of research, innovation and technological development for the socioeconomic and cultural progress of society.   |

## Learning outcomes

| Learning outcomes   | Study programme competences / results |     |    |
|---|---------------------------------------|-----|----|
| Develop the capacity of "spatial imagination", so much so that the student can think"space" (three dimensions) an object represented in the plane (two-dimensional), such as to be represented in the drawing the previously imagined in space. | A2                                    | B1  | C1 |
|   | A6                                    | B3  | C3 |
|   |                                       | B4  | C4 |
|   |                                       | B5  | C5 |
|   |                                       | B7  | C6 |
|   |                                       | B8  | C7 |
|   |                                       | B12 | C8 |
|   |                                       | B14 |    |
|   |                                       | B16 |    |
|   |                                       | B17 |    |
| B27   |                                       |     |    |
| Identify and understand the relations space and the connection between the space sensitive real and the space geometrically represented.  | A2                                    | B1  | C1 |
|   | A6                                    | B4  | C3 |
|   |                                       | B7  | C4 |
|   |                                       | B8  | C5 |
|   |                                       | B12 | C6 |
|   |                                       | B14 | C7 |
|   |                                       | B27 | C8 |



|  |          |  |  |
|--|----------|--|--|
| Know the main bodies and surfaces geometric of application constructive and architectural, both at the level of concept mathematical as of analysis and representation graphics in them main systems of representation perspective.            | A2<br>A6 | B1<br>B3<br>B4<br>B5<br>B7<br>B8<br>B12<br>B14<br>B16<br>B27 | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 |
| Know the main organs and geometric surfaces of constructive and architectural implementation both at the level of mathematical concept based on analysis and graphical representation on major systems from the perspective of representation. | A2<br>A6 | B1<br>B4<br>B7<br>B8<br>B12<br>B14<br>B27                    | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 |
| Understand geometry as a graphic model able to establish spatial relationships that allow the understanding, description and control of constructive and architectural forms.  | A2<br>A6 | B1<br>B4<br>B7<br>B8<br>B12<br>B14<br>B27                    | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 |
| Know the terminology, fundamental concepts, conventions and the theoretical principles that define the elements of the systems of representation employed in building perspective.   | A2<br>A6 | B1<br>B4<br>B8<br>B27  | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 |
| Know the foundations theoretical of the different systems of representation perspective of application in building and architecture  | A2<br>A6 | B1<br>B4<br>B8<br>B12<br>B14<br>B16<br>B27                   | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 |
| Know and apply the methods and paths of systems of representation perspective of application in building and architecture.   | A2<br>A6 | B1<br>B4<br>B8<br>B27  | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 |



|  |          |                       |  |
|--|----------|-----------------------|--|
| Learn to evaluate through criteria logical, coherent and technical, the solution chosen in them paths and apply them methods and paths of each one of the systems of representation studied to it resolution of exercises practical. | A2<br>A6 | B1<br>B4<br>B8<br>B27 | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 |
| Represent the primary geometric forms in any position in space.  | A2<br>A6 | B1<br>B4<br>B8<br>B27 | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 |
| Solve problems positional of intersections, parallelism, perpendicularity and problems metric of distances and determination of angles between those different elements geometric.   | A2<br>A6 | B1<br>B4<br>B8<br>B27 | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 |
| Represent simple geometric bodies in different systems with special emphasis on the representation of elements and applications of architectural, constructive character or use in the building.                                     | A2<br>A6 | B1<br>B4<br>B8<br>B27 | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 |
| Know them fundamentals General of the theory of shadows as rationalization geometric of the phenomenon luminous in the different systems of representation of application architectural.   | A2<br>A6 | B1<br>B4<br>B8<br>B27 | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 |
| Ability to apply the systems of representation spatial perspective: axonometric orthogonal, axonometric oblique and perspective conical.   | A2<br>A6 | B1<br>B4<br>B8<br>B27 | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 |
| Generate and interpret perspectives orthogonal axonometric and oblique under different conditions for the graphical definition of constructive elements.   | A2<br>A6 | B1<br>B4<br>B8<br>B27 | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 |



|  |          |                       |  |
|--|----------|-----------------------|--|
| Use of the ways of putting into perspective for the representation of character building and architectural proposals   | A2<br>A6 | B1<br>B4<br>B8<br>B27 | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 |
| Ability to analyze and learn about the variations of the different elements of the linear perspective, restitution of images perspectives and their generation conditions as well as the basic concepts of the theory of shadows in perspective. | A2<br>A6 | B1<br>B4<br>B8<br>B27 | C1<br>C3<br>C4<br>C5<br>C6<br>C7<br>C8 |

| Contents  |   |
|---|---|
| Topic   | Sub-topic   |
| O DEBUXO ARQUITECTÓNICO E OS SISTEMAS DE REPRESENTACIÓN | O debuxo arquitectónico.<br>Proxección e sección.<br>Propiedades-invariantes- dos tipos de proxección.<br>A biunivocidade dos sistemas de representación. Clasificación.<br>Elementos xeométricos no espazo.<br>Notacións.                              |
| XENERALIDADES DO SISTEMA AXONOMÉTRICO                   | Concepto do sistema.<br>Axonometría ortogonal.<br>Principais axonometrías ortogonais.   |
| AXONOMETRÍA OBLÍCUA                                     | Axonometría oblicua. Xeneralidades.<br>Teorema de Pohlke-Schwarz.<br>Perspectivas Cabllera e Militar.<br>Axonometrías seccionadas.  |
| PRÁCTICA DA AXONOMETRÍA                                 | Paso de sistema Diédrico a Axonométrico e viceversa.<br>Representación de figuras planas e corpos xeométricos.  |
| XENERALIDADES DA PERSPECTIVA LINEAL                     | Concepto de Perspectiva Lineal.<br>Representación da recta. Punto de fuga.<br>Representación do plano. Rectas de fuga.<br>Clasificación das perspectivas lineais:<br>- Segundo a posición do plano do cadro.<br>- Segundo a posición do punto de vista. |
| MÉTODOS CLÁSICOS DA PERSPECTIVA                         | Paso de Sistema Diédrico á Perspectiva Lineal.<br>Perspectiva Lineal Central e Oblicua por raios visuais.   |
| MEDICIÓN DIRECTA EN PERSPECTIVA                         | Perspectiva con puntos de medición. Concepto.<br>Perspectiva Central.<br>Perspectiva Oblicua.   |
| REPRESENTACIÓN DE FIGURAS ESPECIAIS                     | Cadrado referencial. Posicións horizontais, verticais e inclinadas.<br>Figuras especiais. Mallas.   |
| INTRODUCCIÓN Á TEORÍA DE SOMBRAS                        | Asoleo xeométrico.<br>Sombras de puntos e liñas.<br>Sombras de superficies planas.<br>Contraproxección.   |



|                               |   |
|-------------------------------|---|
| SOMBRAS EN PERSPECTIVA LINEAL | <p>Luz solar paralela ao plano do cadro.</p> <p>Luz solar oblicua ao plano do cadro.</p> <ul style="list-style-type: none"> <li>- Sol diante do observador.</li> <li>- Sol detrás do observador.</li> </ul> |
|-------------------------------|---|

| Planning                       |  |                                      |                               |             |
|--------------------------------|--|--------------------------------------|-------------------------------|-------------|
| Methodologies / tests          | Competencies / Results                                       | Teaching hours (in-person & virtual) | Student?s personal work hours | Total hours |
| Guest lecture / keynote speech | A2 A6 B1 B4 B8 B12<br>B14 B27 C1 C3 C4<br>C5 C6 C7 C8        | 27                                   | 43                            | 70          |
| Workshop                       | A2 A6 B1 B3 B4 B5<br>B7 B8 B16 B27 C1<br>C3 C4 C5 C6 C7 C8   | 27                                   | 44                            | 71          |
| Objective test                 | A2 A6 B1 B4 B5 B8<br>B12 B16 B17 B27 C1<br>C3 C4 C5 C6 C7 C8 | 6                                    | 0                             | 6           |
| Personalized attention         |  | 3                                    | 0                             | 3           |

(\*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

| Methodologies                  |  |
|--------------------------------|--|
| Methodologies                  | Description  |
| Guest lecture / keynote speech | Oral and graphic exhibition in the classroom that is complemented with the optional use of media and ICT as well as the introduction of questions to students in order to transmit knowledge and facilitate learning   |
| Workshop                       | <p>Desenvólvese coa finalidade de que o alumnado participe activamente no proceso de aprendizaxe, enfrontándose á necesidade de valorar, responder e experimentar os coñecementos expostos nas sesións maxistras a través de prácticas gráficas.</p> <p>Elíxense para a realización destas prácticas exemplos arquitectónicos reais ou elementos que se consideren axeitados. A formalización dos devanditos proxectos búscase adecuada ao nivel do curso no que se atopa o alumnado e contribúe a familiarizarse co feito arquitectónico.</p> |
| Objective test                 | Test chart used for the evaluation of learning, whose distinctive feature is the ability to determine whether or not the given answers are correct. It is a measure that allows you to assess knowledge, abilities, skills, performance, skills, attitudes, intelligence, etc. It is applicable both for diagnostic, formative summative evaluation.   |

| Personalized attention |   |
|------------------------|---|
| Methodologies          | Description   |
| Workshop               | <p>Atenderanse as necesidades e consultas do alumnado relacionadas co estudo e/ou temas vinculados coa materia, proporcionándolle orientación, apoio e motivación no proceso de aprendizaxe.</p> <p>O "Alumnado con recoñecemento de dedicación a tempo parcial e dispensa académica de exención de asistencia", deberá pór en coñecemento do profesor correspondente, dita circunstancia, para poder concretar o desenvolvemento desta actividade segundo considérese máis adecuada.</p> |

| Assessment    |                        |             |               |
|---------------|------------------------|-------------|---------------|
| Methodologies | Competencies / Results | Description | Qualification |
|               |                        |             |               |



|                |  |   |    |
|----------------|--|---|----|
| Objective test | A2 A6 B1 B4 B5 B8<br>B12 B16 B17 B27 C1<br>C3 C4 C5 C6 C7 C8 | <p>Realizaranse dúas prácticas especiais ao longo do cuadrimestre.</p> <p>Con estas prácticas avaliarase a transferencia dos coñecementos adquiridos polo estudiantado nas diferentes partes da materia.</p> <p>A porcentaxe da nota final será do 55%.</p> <p>Para a aplicación desta porcentaxe será necesaria unha nota media de 5 puntos, entre as dúas prácticas especiais. Para facer a media débense aprobar ambas prácticas con ao menos un 5.</p>  | 55 |
| Workshop       | A2 A6 B1 B3 B4 B5<br>B7 B8 B16 B27 C1<br>C3 C4 C5 C6 C7 C8   | <p>A avaliación das prácticas feitas nas aulas, será ao longo do cuadrimestre. Avaliarase o traballo feito polo alumnado e os coñecementos adquiridos.</p> <p>Debido ao carácter fundamentalmente práctico da materia, requirese unha porcentaxe do 90% de prácticas entregadas en data, atendendo ao calendario académico.</p> <p>No caso de non poder asistir de maneira xustificada, o alumnado poderá entregar o traballo na semana seguinte, sendo a súa valoración do 50% da nota.</p> <p>A porcentaxe sobre da nota final será do 45%.</p> | 45 |

### Assessment comments

NOTA:A AVALIACIÓN SERÁ CONTINUA AO LONGO DO CUADRIMESTRE. A MATERIA APROBARASE POR CURSO, TENDO SUPERADAS AS PARTES QUE FORMAN A NOTA FINAL = [Taller 45% + Proba obxectiva (media de as dúas prácticas especiais) 55%].PARA PODER PRESENTARSE Á SEGUNDA OPORTUNIDADE, O ALUMNADO DEBE CUMPRIR OS MESMOS CRITERIOS ESIXIDOS NA PRIMEIRA OPORTUNIDADE. QUEDA EXCLUIDO O ALUMNADO QUE NON CUMpra DITAS CONDICIÓNs.

### Sources of information

|       |   |
|-------|---|
| Basic | <ul style="list-style-type: none"> <li>- FERRER MUÑOZ (). Axonometrías. Sistema de representación axonométrico.</li> <li>- IZQUIERDO ASENSI, Fernando (). Ejercicios de Geometría Descriptiva Tomo II. Sistema Acotado y Axonométrico.</li> <li>- IZQUIERDO ASENSI, Fernando (). Ejercicios de Geometría descriptiva. Tomo IV. Sistema Cónico. .</li> <li>- IZQUIERDO ASENSI, Fernando (). Geometría Descriptiva.</li> <li>- BARDÉS FAURA; GIMÉNEZ RIBERA (). Geometría Descriptiva. Plans acotats i perspectives. Exercicis.</li> <li>- SÁNCHEZ GALLEG0 (). Geometría descriptiva. Sistemas de Proyección Cilíndrica. .</li> <li>- PALANCAR PENELLA (). Geometría descriptiva. Sistemas de representación axonométrica. Caballera. Planos Acotados.</li> <li>- RODRIGUEZ DE ABAJO (). Geometría Descriptiva. Tomo III: Sistema de Perspectiva Caballera. .</li> <li>- RODRÍGUEZ DE ABAJO (). Geometría Descriptiva. Tomo V. Sistema Cónico. .</li> <li>- RODRÍGUEZ DE ABAJO (). Geométr-a Descriptiva. Tomo IV: Sistema Axonométrico. .</li> <li>- VILLANUEVA BARTRINA (). Perspectiva lineal. Su relación con la fotografía. .</li> <li>- BARTOLOMÉ RAMÍREZ (). Perspectiva: fundamentos y aplicaciones..</li> <li>- FRANCO TABOADA, José Antonio (2011). Geometría Descriptiva para la representación arquitectónica. Santiago de Compostela: Andavira Editora</li> <li>- Rodilla López, José Luis (2009). Perspectiva Lineal (parte I). A Coruña:El autor</li> <li>- (). .</li> </ul> |
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|                      |   |
|----------------------|---|
| <b>Complementary</b> | <ul style="list-style-type: none"><li>- IZQUIERDO ASENSI (). Construcciones Geométricas.</li><li>- ÁLVAREZ BENGOA; RODRÍGUEZ DE ABAJO (). Curso de Dibujo Geométrico y Croquización. .</li><li>- IZQUIERDO ASENSI (). Fórmulas y propiedades geométricas.</li><li>- RENDÓN GÓMEZ (). Geometría paso a paso. Vol. I..</li><li>- Rodilla López, José Luis (2006). Apuntes de Geometría Métrica, Homología y Afinidad. Aplicaciones. A Coruña:El autor</li></ul> |
|----------------------|---|

## Recommendations

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

Descriptive Geometry [In extinction]/670G01004

Architectural Graphic Expression I [In extinction]/670G01008

### Subjects that are recommended to be taken simultaneously

Architectural Graphic Expression II/670G01013

### Subjects that continue the syllabus

### Other comments

In order to approach the fundamentals of graphic representation, it is recommended to take the subject of Geometry of the Representation in a previous or simultaneous way to the rest of subjects of the Area of Expression Architectonic Graphic.PREREQUISITES. It is recommended to have taken the subject of Descriptive Geometry in First Course

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