

		Teaching	g Guide		
Identifying Data				2023/24	
Subject (*)	Engineering drawing			Code	730G05003
Study programme	Grao en Enxeñaría Naval e Ocea	ánica			
		Descr	iptors		
Cycle	Period	Ye	ar	Туре	Credits
Graduate	2nd four-month period	2nd four-month period First Basic training 6			
Language	SpanishGalician	SpanishGalician			
Teaching method	Face-to-face				
Prerequisites					
Department	Enxeñaría Naval e Industrial				
Coordinador	Álvarez García, Ana		E-mail	ana.alvarez1@u	udc.es
Lecturers	Álvarez García, Ana E-mail ana.alvarez1@udc.es		udc.es		
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Web	https://campusvirtual.udc.es/moc	odle/		I	
General description	The subject of graphic expression	n has a theoreti	cal-practical nature	and with it it is intend	led to ensure that the student:
	- Develop the ability to see, imagine, interpret and solve problems using a graphic language.				
	- know the regulations and terminology of graphic expression in naval engineering.				
	- Acquire skill in handling a CAD system (autocad).				

	Study programme competences / results
Code	Study programme competences / results
A5	Have a capacity for the space vision and knowledge of the techniques of graphic representation, so much for traditional methods of metric
	geometry and descriptive geometry, as through the applications of design assisted by computer
B1	That the students proved to have and to understand knowledge in an area of study what part of the base of the secondary education, and
	itself tends to find to a level that, although it leans in advanced text books, it includes also some aspects that knowledge implicates
	proceeding from the vanguard of its field of study
B2	That the students know how to apply its knowledge to its work or vocation in a professional way and possess the competences that tend to
	prove itself by the elaboration and defense of arguments and the resolution of problems in its area of study
B4	That the students can transmit information, ideas, problems and solutions to a public as much specialized as not specialized
B5	That the students developed those skills of learning necessary to start subsequent studies with a high degree of autonomy
B6	Be able to carrying out a critical analysis, evaluation and synthesis of new and complex ideas.
C1	Using the basic tools of the technologies of the information and the communications (TIC) necessary for the exercise of its profession and
	for the learning throughout its life.
C2	Coming across for the exercise of a, cultivated open citizenship, awkward, democratic and supportive criticism, capable of analyzing the
	reality, diagnosing problems, formulating and implanting solutions based on the knowledge and orientated to the common good.
C5	Assuming the importance of the learning as professional and as citizen throughout the life.
C6	Recognizing the importance that has the research, the innovation and the technological development in the socioeconomic and cultural
	advance of the society.

Learning outcomes			
Learning outcomes	Stud	y progra	mme
	competences /		
		results	
Know, understand and use the techniques of graphic representation, spatial conception, standardization, naval design	A5	B1	C1
fundamentals, drawing plans and computer-aided applications that can solve graphically technical application problems.			C2
		B4	C5
		B5	C6
		B6	



Contents				
Торіс	Sub-topic			
The following blocks or themes develop the contents	Spatial vision development techniques. Metric and descriptive geometry. Graphic			
established in the Verification Report card, which are:	representation systems. Introduction to standardization and industry representation.			
	Computer assisted drawing.			
1. SUBJECT TOPICS	1.1 ObJective			
	1.2 Concept of the subject			
	1.3 Exhibition of the methodology			
	1.4 Exhibition of the program			
	1.5 Drawing instruments			
2. BASIC GRAPHICAL EXPRESSION TECHNIQUES	2.1 Review of metric geometry and projective geometry			
	2.2 Descriptive geometry			
3. REPRESENTATION TECHNIQUES. STANDARDIZATION	3.1 Presentation of plans			
	3.2 Presentation of the drawings			
	3.3 Sketch			
	3.4 Orthogonal views			
	3.5 Standardized views			
	3.6 Cuts and sections			
	3.7 Dimensioning			
	3.8 Dimensional tolerances			
	3.9 Graphic presentations			
4. DIHEDRAL SYSTEM	4.1 Point and line			
	4.2 Planes and belonging between straight point and plane			
	4.3 Intersection, parallelism and perpendicularity			
	4.4 Tilting, turning and shifting			
	4.5 Distances and angles			
5. APPLICATIONS OF ENGINEERING	5.1 Drawing in Mechanical Engineering			
	5.1.1 Mechanical sets. Representation of mechanical assemblies. Quartering. Plans			
	and definition of each piece. Standardized pieces. Explosion sets			
	5.2 Connection elements:			
	5.2.1 Detachable connections: Threaded connections: Terminology. Forms of thread			
	profiles. Symbology and representation. Dimension. Threaded holes. Screws: types,			
	representation. Nuts Fixing systems. Keyed links: Types. Representation and			
	dimension			
	5.2.2 Fixed connections: Welding. Types. Representation			
	5.3 Springs: Types: compression, traction, torsion. Flat springs. Representation.			
	Dimension			
	5.4 Bearings: Sliding and rolling bearings. Elements of a bearing. Classification.			
	Representation. Dimension. Standardization. Lubrication. Obturation. Fixings			
	5.5 Gears: Use. Representation. Dimension			
5. LAYOUT OF TECHNICAL DRAWINGS BY COMPUTER	5.1 Introduction to software			
	5.2 Coordinate system			
	5.3 Study of the orders of drawing, modification and visualization.			
	5.4 Representation of pieces			

	Planning	g		
Methodologies / tests	Competencies /	Teaching hours	Student?s personal	Total hours
	Results	(in-person & virtual)	work hours	
Guest lecture / keynote speech	A5 B1 B2 B4 B5 B6	18	18	36
	C1 C2 C5 C6			



ICT practicals	A5 B1 B2 B4 B5 B6	10	20	30
	C1 C5 C6			
Laboratory practice	A5 B1 B2 B4 B5 B6	16	24	40
	C1 C2 C5 C6			
Problem solving	B1 B2 B4 B5 B6 C1	19	19	38
	C2 C5 C6			
Mixed objective/subjective test	A5 B1 B2 B4 B5 B6	1	1	2
	C1 C2 C5 C6			
Personalized attention		4	0	4

(\*)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 presentation complemented by the use of audiovisual media and the
	Introduction of some questions directed to the students, with the purpose of transmitting
	Knowledge and facilitate learning.
ICT practicals	
	It will be formulated the realization of a set of exercises in autocad.
Laboratory practice	
	Problem solving. The realization of a set of exercises is proposed, which will be delivered weekly.
Problem solving	
	Problem solving. The realization of a set of exercises is proposed, which will be delivered weekly
Mixed	A test is proposed at the end of the course, of an eminently practical nature, in which the criteria and skills acquired are
objective/subjective	reflected. The exercises for the evaluation will be applications of cases in which the answer must be expressed, mainly, in a
test	graphic way. No partial evaluations are proposed, although systems may be established that allow the release of part of the
	matter.

	Personalized attention
Methodologies	Description
ICT practicals	It will be carried out face-to-face in the classroom and in the office tutorials. It will also be carried out in a non face-to-face
Mixed	manner through the virtual campus and by e-mail.
objective/subjective	
test	In addition, throughout the course the teaching staff will be available to students during tutorial hours to clarify any doubts that
	may arise. It is possible to make an appointment at other times via the teaching staff's e-mail address.
	In ITC work placements, students will have personalised tutorials and group tutorials to monitor their work.
	For students with academic dispensation, this will be carried out in person in the office tutorials and an appointment can be
	arranged at other times via the teaching staff's e-mail address.

Assessment				
Methodologies	Competencies /	Description	Qualification	
	Results			
Laboratory practice	A5 B1 B2 B4 B5 B6	Descriptive geometry + industrial drawing + Tests	10	
	C1 C2 C5 C6	In the modality of continuous evaluation several works and tests related to the topics		
		of the program will be carried out		
ICT practicals	A5 B1 B2 B4 B5 B6	Practices with autocad.	10	
	C1 C5 C6	Continuous evaluation and supervised jobs.		



Mixed	A5 B1 B2 B4 B5 B6	The test will evaluate the acquisition of criteria, which is derived from an adequate	60
objective/subjective	C1 C2 C5 C6	assimilation of the acquired knowledge, as well as the attainment of the necessary	
test		skill for a correct graphic representation. His character will be eminently practical. The	
		level of execution required will be the same as in the work carried out during the	
		course.	
Problem solving	B1 B2 B4 B5 B6 C1	Descriptive geometry + industrial drawing + Tests	20
	C2 C5 C6	In the modality of continuous evaluation several works and tests related to the topics	
		of the program will be carried out.	

## Assessment comments

1st call: continuous assessment will be followed. In order to pass the subject, students must participate in the classroom in the guided monitoring of all the proposed activities.

2nd call: the mixed test will have a 100% grade.

Early sitting (December): the exam will be graded 100%.

For students with academic dispensation and part-time students, the tests will be the same as those established for the rest of the students. In the second and early opportunity in December they will have to take a mixed test with a 100% grade.

"The fraudulent completion of the tests or assessment activities shall be governed by article 14.4.which reads as follows:? Na realización de traballos, o

plaxio e a utilización de material non orixinal, incluído aquel obtido a través

da internet, sen indicación expresa da súa procedencia e, se é o caso, o

permiso do seu autor/a, poderá ser considerada causa de cualificación de

suspenso na actividade. Todo iso sen prexuízo das responsabilidades

disciplinarias ás que puidese haber lugar tras o correspondente procedemento "

	Sources of information			
Basic	- AENOR (2000). Dibujo técnico. Normas básicas. Madrid. AENOR			
	- Chevalier, A. (2009). Dibujo industrial. Madrid : Limusa			
	- Rodríguez de Abajo , F.J.; Álvarez Bengoa, V (2003). Dibujo industrial. San Sebastián. Donostiarra			
	- Molero Vera, J. (2013). AutoCAD 2013: guía rápida. Barcelona : Inforbooks			
	- Montaño La Cruz, F. (2015). AutoCAD 2015. Madrid: Anaya Multimedia			
	- Saldaña Albillos, Marcelino. (1992). Dibujo técnico: 60 ejercicios resueltos (típicos del 1er curso). Madrid : ETSII,			
	Sección de Publicaciones			
	- Gomis Martí, José María. (1993). Ejercicios de dibujo técnico & amp; amp; quot; curvas y superficies & amp; amp; quot;.			
	Valencia : Universidad Politécnica, Servicio de Publicaciones, D.L.			
	- Defez García, Beatriz. (2010). Ejercicios de planos acotados en ingenieria. Valencia : Editorial de la UPV			
	- Cobos Gutiérrez, C. (2003). Ejercicios de representación gráfica en ingeniería. Madrid : Tébar			
	- Jiménez, I.; Calavera, C. (2011). Sistema Diédrico. Madrid: Paraninfo S.A.			
Complementary	- Leiceaga, J. (1994). Normas básicas de dibujo técnico. Madrid. AENOR			
	- González Vázquez, A.; Izquierdo Asensi, F.; Navarro de Zuvillaga, J. y Placencia Valero, J. (1983). Dibujo Técnico.			
	Madrid, Anaya			
	- Rodríguez de Abajo, F.J. (1994). Curso de Dibujo Geométrico y de Croquización. San Sebastián. Donostiarra			
	Además de los textos que se indican, se proporcionan direcciones de páginas Web, elaboradas por otros docentes,			
	que contienen material docente de utilidad, y son de acceso libre			

Recommendations
Subjects that it is recommended to have taken before
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus



## **Other comments**

In this subject, together with the acquisition of basic knowledge that allow to act with criteria, it is essential the personal exercise. This can not be replaced, nor the time needed to acquire the skill can be shortened. Therefore it is necessary to respect the time programmed for this activity. In fact, the number of hours indicated is the minimum that is considered essential. Given the importance of order and continuity in work, the teacher can be consulted on the approach and distribution of available time. Even though what is indicated below correspondsto the criteria of behaviour and attitude towards the issues raised by theprofessors in charge of this teaching during all the years in which we havetaught these courses, by legal imperative we are obliged to specifyspecifically, the following: "To help achieve a sustained immediateenvironment and meet the objective of action number 5:" Healthy andenvironmental and social teaching and research "of the" Green CampusFerrol Action Plan ": Thedelivery of the documentary works that are made in this matter:? It will be done through virtual campus, in digital format without the need to print them? If it is necessary to make them on paper: - Plastics will not be used - Double-sided prints will bemade. - Recycled paper will be used. - Printing of drafts will beavoided. Further: ? A sustainable use of resources and theprevention of negative impacts on the natural environment must be made. ? The importance of ethical principles relatedto the values ??of sustainability in personal and professional behaviours mustbe taken into account. ? Genderperspective is incorporated into the teaching of this subject (non-sexistlanguage will be used, bibliography of authors of both sexes will be used, intervention in class of students will be encouraged ...). ? Work will be done to identify and modifyprejudices and sexist attitudes, and the environment will be influenced tomodify them and promote values ??of respect and equality. ? Discrimination situations must bedetected and actions and measures will be proposed to correct them.? The full integration of students who, for physical, sensory, psychological or socio-cultural reasons, have difficulties in gaining adequate, & hsp; equal and beneficial access to university life will be facilitated.

(\*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.