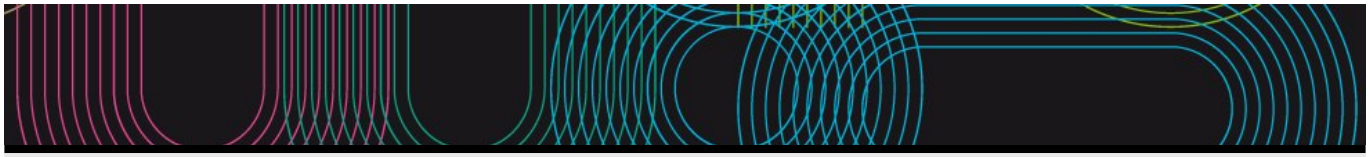

IDENTIFYING DATA				
Technical Office				
Subject	Technical Office			
Code	V12G380V01701			
Study programme	Grado en Ingeniería Mecánica			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	4th	1st 2nd
Teaching language	#EnglishFriendly Spanish Galician			
Department				
Coordinator	Comesaña Campos, Alberto Iglesias Sánchez, Iván Bouza Rodríguez, José Benito Cerqueiro Pequeño, Jorge			
Lecturers	Bouza Rodríguez, José Benito Comesaña Campos, Alberto Iglesias Sánchez, Iván			
E-mail	acomesana@uvigo.es jcerquei@uvigo.es jbouza@uvigo.es ivan.iglesias@uvigo.es			
Web				
General description	The aim of this course is to guide the student in the acquisition of the knowledge and the skills needed to qualify him for the handling and application of the methodologies, techniques and tools oriented to the elaboration, organization and management of projects and another technical documentation regularly used in Engineering Offices, in ways that prepare the student to make use of these skills to carry out similar activities in his future professional activity in the real world. In order to achieve that goal, the course uses a broad approach of the subjects in its contents, looking for the integration of the knowledge achieved along the student's previous courses and its application through the methodology, organization and management of several different modalities of technical works, as they constitute the true essence of the Engineer profession in the framework of his professional competences and fields of activity. This course promotes the development of its associated skills by means of using active and technical collaborative methodologies. In this way, the contents explained in theoretical classes are implemented and developed in the practical activities -oriented to the industrial reality of the profession-, thus assimilating the agile and precise use of the different rules of application and of the professional best practices established, while being supported by the new technologies to document, elaborate, manage and present the technical documentation that correspond to each particular case. The development of this course focuses on the multi-disciplinary context of Engineering, aiming to integrate the knowledge acquired in the other courses in the degree, oriented towards providing the student with capabilities for projecting, designing and developing complex products (parts, components, finished products, etc.), processes and systems that are proper from the degree, making use of some cutting-edge knowledge from said degree, including awareness about the social, health and safety, environmental, economic and industrial aspects, as well as being capable of selecting and applying appropriate project methods. The students will be made capable to perform bibliographical searches, accessing and using conveniently databases and other information sources, in order to carry out simulation and analysis aimed to perform research on technical matters from the degree for making judgements on ethical and social topics. Finally, the students will acquire the capabilities necessary to communicate information, ideas, problems and solutions from the Engineering field and towards Society in general.			

Skills
Code

B1	CG1 Skills for writing, signing and developing projects in the field of industrial engineering, whose purpose, specializing in Mechanics, construction, alteration, repair, maintenance, demolition, manufacturing, installation, assembly or operation of: structures, mechanical equipments, energy facilities, electrical systems and electronic installations and industrial plants, and manufacturing processes and automation.
B2	CG2 Ability to manage the activities object of the engineering projects described in CG1.
C18	CE18 Knowledge and skills to organize and manage projects. Know the organizational structure and functions of a project office.
D1	CT1 Analysis and synthesis
D2	CT2 Problems resolution.
D3	CT3 Oral and written proficiency.
D5	CT5 Information Management.
D6	CT6 Application of computer science in the field of study.
D7	CT7 Ability to organize and plan.
D8	CT8 Decision making.
D9	CT9 Apply knowledge.
D10	CT10 Self learning and work.
D11	CT11 Ability to understand the meaning and application of the gender perspective in the different fields of knowledge and professional practice with the aim of achieving a more just and egalitarian society.
D12	CT12 Research skills.
D13	CT13 Ability to communicate orally and in writing in the Galician language.
D14	CT14 Creativity.
D15	CT15 Objectification, identification and organization.
D16	CT16 Critical thinking.
D17	CT17 Working as a team.
D20	CT20 Ability to communicate with people not expert in the field.

Learning outcomes

Expected results from this subject	Training and Learning Results		
New	B1	C18	D1
	B2		D3
			D5
			D6
			D7
			D8
			D9
			D11
			D14
			D15
			D16
			D17
			D20
New		C18	D1
			D2
			D3
			D5
			D6
			D9
			D10
			D12
			D13
			D15
New	B1		D1
			D3
			D5
			D20
New	B2	C18	D1
			D5
			D7
			D8
			D17
			D20
New	B1		D3
			D20

Contents

Topic

1. Introduction and presentation of the course.	1.1. Presentation. 1.2. Learning guide for the course. 1.3. Criteria and norms for the development of the course. 1.4. Multidisciplinary approach to the profession: legal, normative, economic, organizational and technical aspects.
2. The Engineering Office.	2.1. Introduction to the industrial Engineering office. 2.2. Realisations of the Engineering office. 2.3. Infrastructure of an Engineering office. 2.4. Organisation and management of an Engineering office.
3. Technical reports and similar works.	3.1. Technical reports. 3.2. Assessments, valuations and budgets. 3.3. Other similar technical works. 3.4. Criteria and norms for the editorial and presentation of technical works.
4. The Project methodology.	4.1. Introduction. 4.2. Theories on the Project. 4.3. Methodology of the Project process. 4.4. The phases of the industrial Project.
5. The normative and legal frame of the Project.	5.1. The legal regulations and the Project. 5.2. Specific technical regulations. 5.3. Normalisation, certification, homologation and quality. 5.4. Patent rights and transfer of technology.
6. Documentation in the industrial Project.	6.1. Memory. 6.2. Plans. 6.3. Specifications. 6.4. Measurements and Budget. 6.5. Studies with their own entity.
7. Methods and techniques for the organisation and management of Projects.	7.1. Organisation, direction and coordination of Projects. 7.2. Methods and techniques for the management of Projects. 7.3. Techniques for the optimisation of Projects. 7.4. Tools for the computer-assisted management of Projects.
8. Processing of Projects and of another technical documentation.	8.1. Criteria and norms for the processing of Projects. 8.2. Process for the certification of Projects and other technical documents. 8.3. Management of licences, permissions and authorisations before public and private institutions. 8.4. Bidding and contracting of Projects.
9. Engineering Supervision of industrial projects.	9.1. Professionals that take part in the materialization of projects. 9.2. Functions and activities of the Engineering or Work Supervision. 9.3. Legal frame that regulates the functions and responsibilities of the Engineering Supervision. 9.4. Obligations of the Engineering Supervision in matters of health and Security at work.
Assignment 1. Study and analysis of a project related with the speciality.	The students, either on individually or in groups, will look for a project documentation to study and analyse it, and on which they will elaborate a Technical Report. This Report will contain at least: an assessment of the main aspects that on the view of the student stand out in the project, the description of the project's structure, contents, arrangement and presentation of its documents, as well as its adaptation to the contents of the UNE 157001:2014 standard. The analysis will take into account, among others, the treatment in the project of the social, health and security, environmental, economic and industrial aspects, as well as the level of usage of suitable project methods.
Assignment 2. Realisation of a technical proposal for preparation of a project related with the speciality.	The students will be arranged in groups of three to five members, and they will draft an offer of professional services addressed to a fictional petitioner (internal or external promoter) containing at least the following: the project approach, work methodology to be followed for his elaboration, and description of the material resources and humans that are necessary. This proposal will also address the social, health and security, environmental, economic and industrial aspects. It will promote too that the solutions proposed make use of some avant-garde knowledge in the specific field of engineering. In this work, students will be required to use cutting-edge software packages from the Mechanical Engineering field (AutoCAD, SolidWorks, CATIA, Ultimaker Cura3D, 3D Slicer, MexhMixer, □) that are aplicable to the specific problem to be tackled.

Assignment 3. Elaboration of the documents of a simple project.	The students, arranged in groups of three to five members, will develop, according to its level of difficulty, the documentation for the preliminary draft or of a detail project. It will be required to do a presentation and defence of the work. The students will select and apply appropriate project methods according to the project goals and to the specific technological discipline. In the frame of the development of these documents, the students will have to resort to bibliographic research, query and use of databases and other sources of information, as well as carrying out specific simulations and analyses of the engineering field. The work will be carried out using a multidisciplinary approach, aiming to integrate knowledge from other courses in the degree for the project-level definition of the solution to the posed problem.
Assignment 4. Elaborate a basic planning/scheduling for the execution of the previously elaborated project.	Supported by the project management methods and tools, each student team will elaborate the planning and scheduling for the execution of the works in the previously elaborated project, making use of appropriate methodologies according to the posed goals and to the technological discipline involved.

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	26	40	66
Project based learning	24	48	72
Project based learning	0	6	6
Problem and/or exercise solving	4	0	4
Report of practices, practicum and external practices	0	2	2

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

Methodologies

	Description
Lecturing	The theoretical contents will be presented by the lecturer, complemented with the active intervention of the students, and in total coordination with in the development of the practical activities programmed.
Project based learning	Realisation of an interdisciplinary project resembling a real case with the students arranged in groups, requesting active participation of all members, and with the guidance of the lecturer.
Project based learning	Realisation of an interdisciplinary project resembling a real case with the students arranged in groups, requesting active participation of all members, and with the guidance of the lecturer.

Personalized assistance

Methodologies	Description
Project based learning	Proposition and review of the outcomes of the course activities, aiming to support individually the learning process in small groups of students.

Assessment

	Description	Qualification	Training and Learning Results
Problem and/or exercise solving	A series of proofs for knowledge assessment will take place along the term for the student's evaluation. The extension of the proof will depend on the specific topics to be assessed.	50	B1 C18 D1 D5 D6 D8 D11 D13 D14 D15 D16

Report of practices, practicum and external practices	Along the term, the students will elaborate a series of reports of their practical activities, to be delivered to the lecturer for their continuous evaluation. The implication of the student in the classes and in the realisation of the diverse activities programmed will be taken into account, as well as the compliance of the sumbission terms, and/or the presentation and defence of the works carried out.	50	B1 B2	C18	D1 D2 D3 D5 D6 D7 D8 D9 D10 D14 D15 D17 D20

Other comments on the Evaluation

In the 'continuous evaluation' modality, the students will pass the course if they reach a score of 5.0 points, with no obligation to attend the proof in the official date. A minimum score of 50% of the maximum grade is required for each part and section. The 'continuous evaluation' will consolidate the partial marks, and the students are required to repeat only the failed parts across the continuous evaluation process.

Students wishing to improve their continuous -pass- evaluation grade can do the full official final exam as well. The students that failed the course in the first official date must do a final test that will encompass the whole of the -theory and practiical- course contents, that might include short- and long-answer tests, problem-solving and case study development.

An appropriate ethical behaviour is expected from the student. In the case that a non-ethical -copying, plagiarism, use of unauthorized electronic devices, among others- it will be considered that the student does not meet the necessary requirements to pass the course. In this case the overall grade for the course in the present academic year will be a fail (0.0). Except in the case of specific authorization, no electronic devices will be allowed for the students to use during the evaluation tests. The act of being in posession of a non-authorized device while in the exam room will be taken as a cause for not passing the course in the current academic year, and the overall grade will be a fail (0.0).

Sources of information

Basic Bibliography

Brusola Simón, Fernando, **OFICINA TÉCNICA Y PROYECTOS**, Servicio Publicaciones Universidad Pol. Valencia, 2011

De Cos Castillo, Manuel, **TEORIA GENERAL DEL PROYECTO I: GESTIÓN DE PROYECTOS**, Síntesis, 1995

De Cos Castillo, Manuel, **TEORIA GENERAL DEL PROYECTO II: INGENIERIA DE PROYECTOS**, Síntesis, 1997

Complementary Bibliography

Díaz Martín, Ángel, **EL ARTE DE DIRIGIR PROYECTOS**, 3ª, RA-MA, D.L., 2010

Gómez-Senent Martínez, Eliseo; González Cruz, Mª Carmen, **TEORÍA Y METODOLOGÍA DEL PROYECTO**, Servicio Publicaciones Universidad Pol. Valencia, 2008

Martínez de Pisón Ascacíbar, Francisco Javier, et al., **LA OFICINA TÉCNICA Y LOS PROYECTOS INDUSTRIALES**, Asociación Española de Ingeniería de Proyectos, 2002

Santos Sabrás, Fernando, **INGENIERÍA DE PROYECTOS**, 2ª, Eunsa, 2002

Serer Figueroa, Marcos, **GESTIÓN INTEGRADA DE PROYECTOS**, 3ª, Ediciones UPC, 2010

Recommendations

Subjects that continue the syllabus

Final Year Dissertation/V12G380V01991

Subjects that it is recommended to have taken before

Graphic expression: Graphic expression/V12G380V01101
Graphic engineering/V12G380V01602

Other comments

To register in this course, the students are required to have passed, or at least are registered in, all the courses from previous years to the one this course is placed on. It is necessary to stress the importance of having passed the two courses indicated in the previous section before taking this course.

In case there are any discrepancies, the version in Spanish of this guide will prevail.