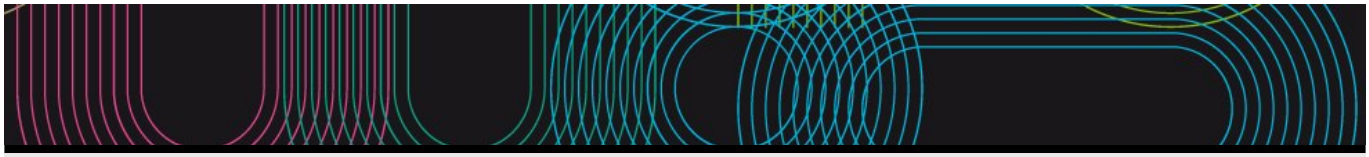

IDENTIFYING DATA				
Technical Office				
Subject	Technical Office			
Code	P52G381V01501			
Study programme	Grado en Ingeniería Mecánica			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	5th	1st
Teaching language	Spanish			
Department				
Coordinator	Núñez Nieto, Xavier			
Lecturers	Núñez Nieto, Xavier Rodríguez Rodríguez, Francisco Javier			
E-mail	xnnieto@cud.uvigo.es			
Web	http://moovi.uvigo.gal			
General description	This course, common to the industrial branch, pursues to orient the student in the acquisition of the knowledge and the skills that enable them for the handle and application of methodologies and technical tools, regarding with the organisation and management of engineering projects and another technical documentation of usual use in a Technical Office. To achieve this mentioned aims there are applied a wide approach of the units composing the course, looking for the integration of the knowledge adquired along the degree and its application by means of a methodology, organisation and management of distinct modalities of technical works, as true essence of the profession of engineer, in the frame of his attributions and fields of activity. It promotes the development of the competences of the matter by means of active and technical methodologies of collaboration. In this way, the exposed contents in theoretical classes implement in the development of the practical activities, oriented to the industrial reality of the profession, assimilating the agile and precise employment of the distinct rule of application and of the professional best practices established, supporting in the new technologies to document, elaborate, manage and present the technical documentation that correspond.			

Training and Learning Results	
Code	
B1	Skills for writing, signing and developing projects in the field of industrial engineering, whose purpose is, 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	Ability to manage the activities object of the engineering projects described in B1.
C18	Knowledge and skills to organize and manage projects. To know the organizational structure and functions of a project office.
D2	Problems resolution.
D3	Oral and written proficiency
D5	Information Management.
D7	Ability to organize and plan.
D8	Decision making.
D9	Apply knowledge.
D10	Self learning and work.
D12	Research skills.
D14	Creativity.
D15	Objectification, identification and organization.
D17	Team working.
D20	Ability to communicate with people not expert in the field.

Expected results from this subject

Expected results from this subject	Training and Learning Results		
Manage of methods, technics and tools of design, organisation and management of projects	B1 B2	C18	D3 D5 D7 D8 D9 D14 D15 D17 D20
Ability in the handle of information an communication systems in the industrial field.	B1 B2	C18	D3 D5 D7 D8 D9 D10 D14 D15 D17 D20
Ability to generate the documents of the project and other similar technical documents.	B1		D3 D5 D20
Ability in the facultative direction of projects in the field of the industrial engineering.	B2	C18	D5 D7 D8 D17 D20
Skills to communicate properly the knowledge, procedures, results of the field of the Industrial Engineering.	B1		D3 D20
ENAEE LEARNING OUTCOME: KNOWLEDGE And UNDERSTANDING: LO1.3.- Awareness of the wider multidisciplinary context of engineering (Level of achievement: Intermediate (2)).		C18	
ENAEE LEARNING OUTCOME: ENGINEERING ANALYSIS: LO2.1.- Ability to analyse complex engineering products, processes and systems in their field of study; to select and apply relevant methods from established analytical, computational and experimental methods; to correctly interpret the outcomes of such analyses (Level of achievement: Intermediate (2)).	B1 B2		D2 D8 D9
ENAEE LEARNING OUTCOME: ENGINEERING ANALYSIS: LO2.2.- Ability to identify, formulate and solve engineering problems in their field of study; to select and apply relevant methods from established analytical, computational and experimental methods; to recognise the importance of non-technical □societal, health and safety, environmental, economic and industrial □ constraints (level of achievement: Intermediate (2)).			D2 D8 D9 D14
ENAEE LEARNING OUTCOME: ENGINEERING DESIGN: LO3.1.- Ability to develop and design complex products (devices, artefacts, etc.), processes and systems in their field of study to meet established requirements, that can include an awareness of non-technical □ societal, health and safety, environmental, economic and industrial□ considerations; to select and apply relevant design methodologies (level of achievement: Intermediate (2)).		C18	D2 D7 D9
ENAEE LEARNING OUTCOME: ENGINEERING DESIGN: LO3.2.- Ability to design using some awareness of the forefront of their engineering specialisation (level of achievement: Intermediate (2)).	B1	C18	D7 D9
ENAEE LEARNING OUTCOME: INVESTIGATIONS: LO.4.1.- Ability to conduct searches of literature, to consult and to critically use scientific databases and other appropriate sources of information, to carry out simulation and analysis in order to pursue detailed investigations and research of technical issues in their field of study (level of achievement: Intermediate (2)).		C18	D5 D12
ENAEE LEARNING OUTCOME: INVESTIGATIONS: LO4.2.- Ability to consult and apply codes of practice and safety regulations in their field of study (level of achievement: Intermediate (2)).		C18	
ENAEE LEARNING OUTCOME: ENGINEERING PRACTICE: LO5.2.- Practical skills for solving complex problems, realising complex engineering designs and conducting investigations in their field of study (level of achievement: Intermediate (2)).		C18	D2 D9 D12 D15
ENAEE LEARNING OUTCOME: ENGINEERING PRACTICE: LO5.3.- Understanding of applicable materials, equipment and tools, engineering technologies and processes, and of their limitations in their field of study (level of achievement: Intermediate (2)).			D8 D9
ENAEE LEARNING OUTCOME: ENGINEERING PRACTICE: LO5.4.- Ability to apply norms of engineering practice in their field of study (level of achievement: Intermediate (2)).		C18	D9
ENAEE LEARNING OUTCOME: ENGINEERING PRACTICE: LO5.5.- Awareness of non-technical - societal, health and safety, environmental, economic and industrial - implications of engineering practice (level of achievement Intermediate (2)).		C18	

ENAEE LEARNING OUTCOME: MAKING JUDGEMENTS: LO6.2.- Ability to manage complex technical or professional activities or projects in their field of study, taking responsibility for decision making (level of achievement: Intermediate (2)).	B1 B2	C18	
ENAEE LEARNING OUTCOME: COMMUNICATION AND TEAM-WORKING: LO7.1.- Ability to communicate effectively information, ideas, problems and solutions with engineering community and society at large (level of achievement: Intermediate (2)).	B1		D3 D5 D20
ENAEE LEARNING OUTCOME: COMMUNICATION AND TEAM-WORKING: LO7.2.- Ability to function effectively in a national and international context, as an individual and as a member of a team and to cooperate effectively with engineers and non-engineers (level of achievement: Intermediate (2)).	B1		D3 D5 D7 D8 D10 D17 D20

Contents	
Topic	
Unit 1. The technical office	1.1 Concept of technical office 1.2 Functions and scope of work 1.3 Departmental infrastructure 1.4 Exercise of the engineer profession 1.5 Attributions and professional competences 1.6 Professional engineering associations
Unit 2. Stages of the project	2.1 Previous study 2.2 Preliminary engineering 2.3 Detail engineering 2.4 Material execution
Unit 3. Project management	3.1 Methodology 3.2 Organisation of the project 3.3 Planning procces 3.4 Management software
Unit 4. Documents of the project	4.1 Memory 4.2 Planes 4.3 Folder of Conditions 4.4 Budget 4.5 Own entity studies 4.6 Attachments
Unit 5. Transaction and contracting	5.1 Criteria and procedure rules 5.2 Licenses, authorizations and permits 5.3 Bidding and contracting
Unit 6. Facultative direction	6.1 Protagonists in the execution of a project 6.2 Functions of the facultative direction 6.3 Obligations and responsibilities
Unit 7. Legal framework	7.1 Legislative basis and scope of the project 7.2 Specifications and technical standards 7.3 Standardization, certification and homologation 7.4 Standardization and certification entities

Laboratory: Engineering Project	Description: During the laboratory sessions, the group development of a traditional Mechanical Engineering project will be carried out, applying the knowledge acquired during the theoretical sessions, which will cover the overall content of the whole subject. This project will include all the technical documentation associated with the elaboration of its content, namely: Memory, Plans, Folder of Conditions and Budget. Objectives: Analysis of the problem, situation, conditioning characteristics and feasibility study. Preparation of the technical documentation associated with the project, including descriptive memory, measurements and calculations. Handling, scaling, plotting and folding of planes. Study and elaboration of the technical, optional, economic and legal specifications. Estimate of the material execution budget. Inclusion, when appropriate, of the pertinent own entity studies regarding the project: Health and Safety, Occupational Hygiene and Environmental Impact Assessment. Exhibition and public oral defence of the projected work. Duration: The students will have the practical laboratory sessions, under the supervision of the teachers, to carry out the development of the project, which will culminate with its defense and oral presentation.

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	28	28	56
Laboratory practical	12	24	36
Seminars	20	17	37
Practices through ICT	6	6	12
Objective questions exam	6	0	6
Project	2	0	2
Problem and/or exercise solving	1	0	1

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

Methodologies

	Description
Lecturing	Master class. Each thematic unit will be presented by the lecturer, complemented with the comments of the students with base in the bibliography assigned or another pertinent. In these sessions, there will be explained in detail the basic theoretical contents of the program, exposing explanatory examples from which deepen in the understanding of the subject. They will be used computer presentations and the blackboard, especially to transmit information like definitions, charts and so on. Whenever is possible, there will be provided a copy of the slides to the students before the exhibition, focusing the effort of the lecturer and the student on the exposure and understanding of the knowledge. Anyway, the reproductions in paper of the slides never have to be considered like substitutes of the texts or notes, but like complementary material.
Laboratory practical	It will be proposed a project of realisation in group that will cover the knowledge and the total length of the course. For the realisation of that task there will be employed the methodology of project-based learning. It will be provided the needed material for the realisation of the work. Finally there will be carried out a public exhibition of the project.
Seminars	An intensive review course will be held, aimed at students who fail to pass the subject in the first call.
Practices through ICT	There will be proposed exercises that will be solved in group or individually. By means of this methodology and the suitable software of project management, there will be carried out diverse activities, whose final result will suppose the whole planning process corresponding to a constructive project considering all its stages. There will be proposed several activities, using the appropriate software for project management, related to the planning process of an engineering project throughout its different stages.

Personalized assistance

Methodologies	Description

Seminars	The teaching staff of the subject will answer the doubts and queries of the students in a face to face and telematic way (email, videoconference, virtual forums, etc.), during the tutoring schedule available on the website of the center.

Assessment					
	Description	Qualification	Training and Learning Results		
Objective questions exam	There will be carried out two written exams with questions test type and/or of development on the theoretical sessions: One Intermediate Exam (PI) with an average weight of 20% on the grade of the course and a Final Exam (PF) with an average weight on the grade of the matter of 40%.	60	B1	C18	D5 D8 D14 D15
Project	Project report and defence by means of oral presentation.	30	B1 B2	C18	D2 D3 D5 D7 D8 D9 D10 D12 D14 D15 D17 D20
Problem and/or exercise solving	Questionnaire that will cover all the sessions in this regard.	10	B2	C18	D2 D5 D7 D8 D9 D15 D17

Other comments on the Evaluation

The final evaluation will be the sum of the punctuation awarded to each one of the before commented parts, being the Note of Final Continuous Evaluation (FCE):

FCE = 0,6 * THEORY + 0,3 * PROJECT + 0,1 * QUESTIONNAIRE

In addition to reaching a final qualification of at least 5 points on 10 (FCE ≥ 5), to surpass the matter by continuous evaluation there will be demanded some minimum requirements, that guarantee the balance between all the types of skills. These requirements are the following:

- To obtain a note of at least 4 points on 10 in the continuous evaluation final exam (PF).

In case of not surpassing the matter by continuous evaluation, the students will have to attend the ordinary examination of first call. Likewise, in the particular supposition of not to fulfil the minimum requirements established, the qualification of the continuous evaluation will be calculated as follows: FCE FINAL = min (4, FCE). On the other hand, the students that surpass the matter by continuous evaluation will be able to attend to the ordinary examination of first call to improve their qualification.

Both, in the ordinary examination of first call and the extraordinary (second call), will be evaluated all the skills of the course, including those referred to the theoretical sessions, practical, seminars and to the realisation of the group project.

ACADEMIC INTEGRITY: Students are expected to show adequate ethical behaviour, committing to act honestly. Based on article 42.1 of the *Regulation on the evaluation, qualification and quality of teaching and the student learning process of the University of Vigo*, as well as point 6 of the fifth rule of *Order DEF/711/2022, of July 18th, which establishes the requirements for evaluation, progress, and ongoing enrolment in military educational training centres for incorporation into the ranks of the Armed Forces,* **any violation of academic integrity in the assessment process, as well as the cooperation in it will result in the assignment of a failing grade to the student (zero) for the entire course in the corresponding assessment opportunity,** regardless of the percentage of importance that the test in question had in

the overall continuous assessment and independently of other disciplinary actions that may be applied.

Sources of information

Basic Bibliography

Brusola Simón, Fernando, **OFICINA TÉCNICA Y PROYECTOS**, Servicio de Publicación de la Universidad Politécnica de Valencia, 1ª Edición, 2011

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

Complementary Bibliography

Cano, J.L., **MANUAL DE GESTIÓN DE PROYECTOS**, Asociación Española de Ingeniería de Proyectos (AEIPRO), 1ª Edición, 2003

De Cos Castillo, Manuel, **TEORIA GENERAL DEL PROYECTO I: GESTIÓN DE PROYECTOS**, Síntesis, 4ª Edición, 1997

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Díaz Martín, Ángel, **EL ARTE DE DIRIGIR PROYECTOS**, Servicio de Publicación de la Universidad Politécnica de Valencia, 3ª Edición, 2010

Gómez-Senent Martínez, Eliseo; González Cruz, Mª Carmen, **TEORÍA Y METODOLOGÍA DEL PROYECTO**, Servicio de Publicación de la Universidad Politécnica de Valencia, 1ª Edición, 2008

Martínez de Pisón Ascacíbar, Francisco Javier, et al., **LA OFICINA TÉCNICA Y LOS PROYECTOS INDUSTRIALES**, Asociación Española de Ingeniería de Proyectos (AEIPRO), 1ª Edición, 2002

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

Canito Lobo, José Luis, **Autodesk Inventor 2017**, Anaya, 1ª Edición,

Chatfield, Carl, Johnson, Tymothy, **MICROSOFT PROJECT 2013: STEP BY STEP**, Microsoft Press, 4ª Edición, 2013

Hervo, Corinne, **MICROSOFT OFFICE 2013: WORD, EXCEL POWERPOINT Y OUTLOOK 2013: FUNCIONES BÁSICAS**, Ediciones ENI, 1ª Edición, 2014

Leach, James A., **AUTOCAD 2016 INSTRUCTOR**, SDC Publications, 1ª Edición, 2016

Reyes Rodríguez, Antonio Manuel, **AUTOCAD 2016**, Anaya, 1ª Edición, 2015

Recommendations

Subjects that continue the syllabus

Final Year Dissertation/P52G381V01991

Subjects that it is recommended to have taken before

Graphic engineering/P52G381V01304

Other comments

For the successfull development of this subject it is recommended to possess a personal profile in which they are present the following qualities and skills:

- Capacity of written and oral understanding.
- Autonomous capacity for research and information compilation.
- Skills for the work in group.
- Basic notions related with the field of the design in the engineering, the calculation of installations and the industrial construction.