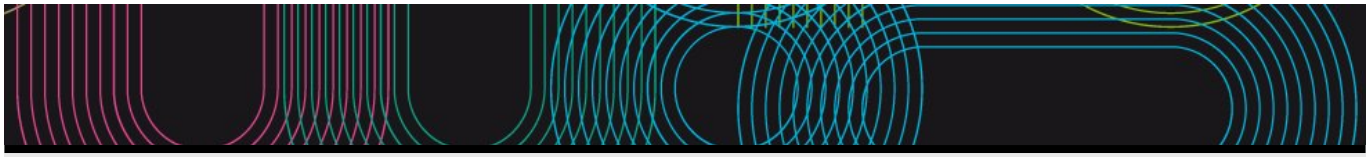

IDENTIFYING DATA				
Technical Office				
Subject	Technical Office			
Code	V12G320V01704			
Study programme	Degree in Electrical Engineering			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	4th	1st
Teaching language	Spanish			
Department				
Coordinator	Comesaña Campos, Alberto			
Lecturers	Alonso Rodríguez, José Antonio Comesaña Campos, Alberto González Cespón, Jose Luis Troncoso Saracho, José Carlos			
E-mail	acomesana@uvigo.es			
Web	http://http://webs.uvigo.es/oficinatecnica/			
General description	This course has as a vision and mission to bring the student closer to his later professional life through knowledge, handling and application of methodologies, techniques and tools oriented to preparation, organization and management of projects and other technical documents. A practical approach to the topics will be used, seeking the integration of the knowledge acquired throughout the university career in order to apply it to the development of the methodology, organization and management of technical work, as the true essence of the profession of engineer in the framework of its responsibilities and fields of activity. The development of course learning outcomes will be promoted through a theoretical-practical approach in which the contents exposed in a theoretical way are developed through the carrying out of practical activities and application work oriented to the industrial reality of the profession, assimilating the agile and precise use of the different implementing normative and established good practices. Given the variety that occurs in the spectrum of career opportunities, the academic program has a part of contents common to all Industrial Engineers. It tries to transmit those aspects that reinforce multidisciplinarity and has another more specific part of the specialty which refers to methodological or regulatory aspects of this field. Likewise, the strategy used allows the student to be exposed to the professional alternatives that are open to her, from free professional practice (expert report, opinions, reports, projects, etc.), to immersion in a small / medium technical office more oriented to facilities or even to product design.			

Competencies	
Code	
B1	CG1 Skills for writing, signing and developing projects in the field of industrial engineering, whose purpose, within the field of Electric Engineering, 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 in professional practice with the aim of achieving a more just and equal 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		
(*)CT1 Análisis y síntesis. Saber Saber hacer		C18	D3 D5 D6 D9 D10 D17
(*)CT2 Resolución de problemas	B1 B2	C18	D2 D5 D7 D8 D10 D12 D15 D17 D20
(*)CT3 Comunicación oral y escrita de conocimientos en lengua propia	B1 B2		D1 D3 D5 D6 D7 D9 D14 D15 D17
(*)CT5 Gestión de la información	B2	C18	D1 D2 D3 D5 D6 D7 D8 D9 D11 D13 D14 D16 D17 D20
(*)CT6 Aplicación de la informática en el ámbito de estudio			D3 D5 D6 D7 D13 D14 D17 D20

Contents

Topic	
1.- Presentation	Presentation Guides Educational Methodology of work. Groups of work Sources of information and communication: TEMA and other Knowledges and Computer Applications for the matter.

2.- Technical office.	□ Introduction □ Work. □ Organisation of the work □ Integration with the systems gives company □ Decision making. □ Communication.
3.- Industrial project	□ Project: Concept, classification, structure, cycle of life. □ Documents of the project: Index, memory, plans. Specifications, budget, studies with own entity. □ Normalisation. UNE 157002.
4.- Technical documents	□ Technical reports □ Certifications □ Homologation □ Expert's reports □ Valuations
5.- Legislation	□ Legislative legislation □ Interpretation gives technical legislation □ Generic technical legislation applied the specialty
6.- Budget and planning	□ Measurement □ Economic assessment □ Theory of management and planning of projects. □ Agile methodologies, □ Gantt, CPM and PERT
7.- Studies with own entity	□ Relative studies to the fulfillment of the legislation of labour risks. □ Relative studies to the fulfillment of the legislation of management of waste. □ Other studies.
8.- Administrative management of works of engineering.	□ Processing: Visa, notary, Public Organisms, etc. □ Management of licences, permissions and permissions in front of public and personal institutions. □ Bidding and contracting of projects.
9.- Professional activity	□ Professions regulated □ Free Exercise of the profession □ Exercise of the profession by extraneous account. □ Exercise of the profession in the public administration □ Facultative management □ Civil and professional Responsibility □ Schools and professional associations.
10.- Patent rights.	□ Technological innovation and patent rights. □ Patents and models of utility.

Planning

	Class hours	Hours outside the classroom	Total hours
Introductory activities	2	1	3
Lecturing	12	24	36
Presentation	2	4	6
Mentored work	2	6	8
Project based learning	12	24	36
Problem solving	6	6	12
Practices through ICT	4	4	8
Project based learning	8	24	32
Scientific events	1	4	5
Objective questions exam	0.5	1.5	2
Problem and/or exercise solving	0.5	1.5	2
*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.			

Methodologies

	Description
Introductory activities	The subject will be presented, information of the contents of the same, methodologies that are going to be applied, work to be done in the subject and form of evaluation. In addition, classroom dynamics will be developed to foster interrelation in students.
Lecturing	Teacher presentation of the contents on the subject of study, theoretical bases and / or guidelines of a work, exercise or project to be developed by the student.
Presentation	It will be presented by the students, either individually or in groups, in front of the teacher and the rest of the class, content of the subject, results of work done, etc.

Mentored work	Prepare a technical report on any matter related to Industrial Engineering, with the quality and rigor expected from an Industrial Engineer.
Project based learning	A work will be carried out applying the methodology of "Project Based Learning - ABP". Performing an engineering project, working with an open team. Emphasis will be placed on the application of industrial engineering tools and knowledge to create engineering solutions for the real needs of an industry.
Problem solving	A work will be carried out applying the methodology of "Project Based Learning - ABP". Performing an engineering project, working with an open team. Emphasis will be placed on the application of industrial engineering tools and knowledge to create engineering solutions for the real needs of an industry.
Practices through ICT	Activities of application of knowledge in a given context, and acquisition of basic and procedural skills in relation to the subject, through ICT.
Project based learning	An interdisciplinary group will be created with students from other subjects and grades. This group, applying the methodology "design thinking" will provoke a work of implantation and / or improvement on a concrete activity.
Scientific events	To present the ideas developed by the students in the collaborative groups, a presentation is organized in a congress format. This will be published and disseminated in different media.

Personalized assistance

Methodologies	Description
Project based learning	The student, of individual way, elaborates a technical report, or similar document, on a subject proposed by the professor. The tutorial sessions will be individual. They cleared the doubts of the student and helped him in the organisation and planning of the work. Can realise tutorial sessions in small group. Gathering to students with the even problem, for a better efficiency. Note that for all teaching modalities the tutorial sessions may be carried out by telematic means (email, videoconference, FAITIC forums, ...) with prior agreement.
Mentored work	The student realised am engineering project, working with an open team. It will do upsetting in the application of tools and knowledges of industrial engineering to create solutions of engineering for the real needs of an industry. They will do tutorial sessions of group with the professor to clear doubts and for the follow-up of the work.
Scientific events	It worked with the different groups of students to help them to prepare the public exhibition of his work. It realised several essays with them and oriented them to achieve an effective presentation.

Assessment

	Description	Qualification	Training and Learning Results
Presentation	Brief presentation of a concrete topic proposed by the professor. The presentation made in class. It will publish an evaluation rubric in the platform TEMA of the course.	5	D1 D3 D5 D6 D17 D20
Mentored work	Elaborate a relative technical report the any question related with the Industrial Engineering, with the quality and the rigour that expects of an Industrial Engineer. It will publish an evaluation rubric in the platform TEMA of the course.	10	B1 D1 D2 D3 D5 D6 D7 D8 D9 D10 D12 D15 D16 D20

Project based learning	Realisation of a work in interdisciplinarity group, with students of other courses and degrees. This group, applying the methodology "design thinking", will make a work of implantation and/or improvement on a concrete activity. It will publish an evaluation rubric in the platform TEMA of the course.	15	B1 B2	D1 D2 D5 D7 D8 D9 D11 D12 D13 D14 D15 D16 D17 D20
Project based learning	Realisation of an engineering project working with an open team. It will do upsetting in the application of tools and knowledges of industrial engineering to create solutions of engineering for the real needs of an industry. It will publish an evaluation rubric in the platform TEMA of the course.	40	B1 B2 C18	D1 D2 D3 D5 D6 D7 D8 D9 D16 D17 D20
Scientific events	Presentation of the ideas developed by the students in the collaborative groups. This activity will be publish and with diffusion in different media. It will publish an evaluation rubric in the platform TEMA of the course.	10		D1 D3 D5 D6 D17 D20
Objective questions exam	Exam for evaluation of the adquired learning outcomes include enclosed questions with different alternative of answer. The students select an answer between a number limited of possibilities.	10		
Problem and/or exercise solving	Problems for evaluation of the adquired learning outcomes that include direct questions on a concrete topic. The students have to answer of direct and brief way in base to the knowledges that have on the matter.	10		

Other comments on the Evaluation

EVALUATION SYSTEM:

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The default evaluation system is the continuous evaluation system.

The student who wishes to host a non-continuous evaluation system must officially request it, within the time and manner established for that, in the E.E.I. If the student requests and obtains the favorable verdict of the resignation to the continuous evaluation, it is understood that it is in the continuous evaluation system.

The student who intends to request the resignation of evaluation will continue to notify the teacher as soon as possible. It is recommended to do so at the beginning of the course, or before beginning the teaching.

The evaluation will be made based on the rubrics that are published in the TEMA platform of the subject.

CRITERIA FOR OVERCOMING THE MATTER THROUGH CONTINUOUS EVALUATION:

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To overcome the subject by means of continuous assessment, they must simultaneously fulfill two conditions:

a) Obtain a minimum score of 4 out of 10 in each of the evaluable sections.

b) Obtain an average grade, weighted according to the percentages indicated above, minimum of 5 out of 10.

If a section is suspended, or the student wishes to improve the grade of a section, he / she will have a maximum of two (2) opportunities to do so. In this case, a correction coefficient will be applied to the qualification of the section. The score will be multiplied by 0.85, the first time and by 0.75 the second time. The deadline for such corrections will be set by the

teacher.

CRITERIA FOR OVERCOMING THE MATTER THROUGH EVALUATION NOT CONTINUOUS:

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Students who choose to officially resign to continuous assessment must carry out a tutored work by the teacher, consisting of an industrial project or similar, and an evaluation test.

To obtain the grade, you will find the average proportional (60% theory and 40% practical). It is obligatory to obtain a minimum grade of 4 points out of 10 in each of the two parts.

To overcome the matter, the aforementioned average must be a minimum of 5 points out of 10 possible.

ETHICAL COMMITMENT:

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It is expected that the student presents an appropriate ethical behavior.

In attending the course, the student, acquires a commitment of teamwork, collaboration and respect to colleagues and teachers.

In the case of detecting unethical behavior (copying, plagiarism, use of unauthorized electronic devices and others) it will be considered that the student meets the necessary requirements to overcome the matter. In this case the overall grade in this academic year will be suspended (0.0).

Sources of information

Basic Bibliography

O profesor da asignatura, **Apuntes de Oficina Técnica**, Plataforma Teledocencia, 2017

Comité CTN 157 - PROYECTOS, **UNE 157001:2014:Criterios generales para la elaboración formal de los documentos que constituyen un proyecto técnico**, AENOR, 2014

Cos Castillo, Manuel de, **Teoría general del proyecto**, Sintesis, 1995

Cos Castillo, Manuel de, **Teoría general del proyecto II**, Sintesis, 1997

Paso a paso con GanttProject, conectareducacion.educ.ar, 2016

Complementary Bibliography

GARCIA-HERAS PINO, ÁLVARO y JULIÁN RODRÍGUEZ FERNÁNDEZ, **Documentación técnica en instalaciones eléctricas**, 2, Paraninfo, 2017

Recommendations

Subjects that continue the syllabus

Methodology for the preparation, presentation and management of technical projects/V12G320V01905
Final Year Dissertation/V12G330V01991

Subjects that it is recommended to have taken before

Graphic expression: Fundamentals of engineering graphics/V12G320V01101
Computer science: Computing for engineering/V12G320V01203
Electrical engineering/V12G320V01401
Basics of circuit analysis and electrical machines/V12G320V01304
Basics of operations management/V12G320V01605
Electrical installations 1/V12G320V01503
Electrical installations 2/V12G320V01602

Other comments

Basic knowledge of computer science, systems representation, standardization of drawing, industrial standardization and construction.

For the acquisition of the competences envisaged in this matter, it is recommended that active participation and participation in all planned activities and the use of tutorials, especially those related to the review of the works.

The key point to successfully pass the subject is to "understand" the subject and not so much its "memorization". In case of doubts or questions, the student should ask the teacher well in class, during the student's hours or telematically.

As a general rule a resolute doubt avoids five questions in the future.

Students are advised to attend the tutorial sessions to expose doubts. Active participation in the tutoring mechanisms is recommended.

Finally, with regard to attendance, although some minimums are set in theory and practice, students are advised to attend all the theoretical and practical sessions of the subject.

Didactic materials
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It requires access to the internet and the usual office tools.
The documentation will be facilitated through the TEMA platform and will be expanded and commented on the face-to-face classes and other face-to-face activities.

Contingency plan

Description

=== EXCEPTIONAL MEASURES SCHEDULED ===
Considering the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution determine it. It is based on safety, health and responsibility, and it guarantees teaching in an online or semi-presential modalities. These already planned measures will guarantee, at the required time, the development of teaching in a more agile and effective way, because they will be known in advance by students and teachers through the standardized tool for teaching guides.

= ADAPTATION OF METHODOLOGIES =
- Teaching methodologies that would be kept
All stated methodologies are kept

- Teaching methodologies that would be modified
Teaching methodologies are not modified

- Non-attendance mechanism for student attention (tutorial session)
By prior agreement through virtual offices

- Modifications (if applicable) of the content to be taught
Contents are not modified

- Additional bibliography to facilitate self-learning
The documentation that the teachers provide through the FAITIC platform

- Other modifications
If it is not possible to celebrated the ApS - Desing Thinking work presentation congress in person under the health circumstances of the moment or by order of the authorities it will be replaced by recorded presentations, in accordance with the instructions provided at the time by teachers on the subject.

= ADAPTATION OF EVALUATION =
According to the instructions received, 3 levels of contingency are established:

a) PRESENTIAL TEACHING MODALITY: All teaching is face-to-face and is carried out in the usual way.

b) SEMI-PRESENTIAL TEACHING MODALITY: In this case, when the government or academic authorities indicate it, part of the classes will be taught by telematic means in order to maintain safety distances. In this situation, the classes corresponding to the theory of the subject will be taught telematically, through the remote campus of the University of Vigo, giving practical classes in person, whenever it is possible to maintain the established security requirements.

c) ONLINE TEACHING MODALITY: All teaching will be taught by telematic means through the remote campus of the University of Vigo. In all cases, class schedules, activity calendars, learning objectives, and assessment tests to be done are maintained. Only the face-to-face celebration of the Collaborative Work Congress is varied, if it is not possible according to the health circumstances of the moment, to hold congresses or face-to-face meetings. The teachers contemplated all the scenarios and the students will be provided with the necessary didactic material according to the current circumstances.