



## IDENTIFYING DATA

### Technical Office

Subject	Technical Office			
Code	V12G330V01604			
Study programme	Degree in Industrial Electronics and Automation Engineering			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	3rd	2nd
Teaching language	Spanish			
Department	Design in Engineering			
Coordinator	Alonso Rodríguez, José Antonio Cerqueiro Pequeño, Jorge			
Lecturers	Alonso Rodríguez, José Antonio Cerqueiro Pequeño, Jorge			
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Web	<a href="http://http://webs.uvigo.es/oficinatecnica/">http://http://webs.uvigo.es/oficinatecnica/</a>			
General description	<p>This subject has how vision and how mission attach to the student to the his back professional life through the knowledge, handle and application of methodologies, technical and geared tools to the manufacture, organisation and management of projects and other technical documents.</p> <p>It employed a practical approach of the subjects, looking for the integration of the knowledges purchased along the career of face to the his application to the development of the methodology, organisation and management of technical works, how true essence of the profession of engineer in the frame of the his attributions and fields of activity.</p> <p>It Will promote the development of the competitions of the subject by means of a theoretical approximation-practical, in the that the contents exposed of theoretical way develop by means of the realization of practical activities and works of application guided to the industrial reality of the profession, assimilating the employment *áxil and need of the distinct rule of application and of the good practices established.</p> <p>Given the variety that produces in the spectrum of professional exits, the academic program possesses a part of general contents it all the Industrial Engineers, in the that treats to transmit those aspects that reinforce the **pluridisciplinaridad and possesses another more specific part of the speciality, that does reference to methodological or normative aspects gave field.</p> <p>Likewise the strategy employed allows to expose to the student the professional alternatives that open him, from the free professional exercise (**peritaciones, *ditames, reports, projects, etc.), it ties his immersion in a small / average technical office more geared the installations or even to the design of product.</p>			

## Competencies

Code	
B1	CG1 Skills for writing, signing and developing projects in the field of industrial engineering, whose purpose, within the field of Industrial Electronic and Automation, 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.
D2	CT2 Problems resolution.
D3	CT3 Oral and written proficiency.
D5	CT5 Information Management.
D7	CT7 Ability to organize and plan.
D8	CT8 Decision making.
D9	CT9 Apply knowledge.
D10	CT10 Self learning and work.

D12 CT12 Research skills.

D14 CT14 Creativity.

D15 CT15 Objectification, identification and organization.

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		
- I handle of methods, technical and tools of design and of organisation and management of projects.	B1 B2	C18	D2 D3
- Skill in the handle of systems of information and of the communications in the industrial field.			D5
- Skills for the generation of the documents of the project and other similar technical documents.			D7
- Skill in the direction facultativa of projects in the field of the industrial engineering.			D8
- Skills to communicate properly the documents, procedures, results, skills of the field of the industrial engineering.			D9 D10 D12 D14 D15 D17 D20

### Contents

Topic	
Presentation	Presentation Teaching Guide Methodology of work. Groups of work Sources of information and communication: TEMA and others Knowledge and computer applications for the subject.
Technical office	Introduction Functions. Organization of work Teamwork Techniques. Integration with the company's systems. Kanban. Decision-making by weighting criteria. Communication.
Industrial project	Project: Concept, classification, structure, life cycle. Project documents: Index, memory, plans. Specifications, budget, studies with their own entity. Standardization. UNE 157002.
Life Cycle of a technical project	Functional block diagram and description. Global definition of the project. Legal feasibility. (PGOM and environmental legislation) Phase II. Scope and objectives. Phase III. Realization of the project. Phase IV. Close permits certifications in the project
Industrial Project. Technical documents.	Project: Concept, classification, structure, project documents: Index, report, plans. Specifications, budget, studies with its own entity.
Industrial Project. Memory	Memory Structure and index of the memory. Objective and scope. Identifying information. Legislation of the project. Description of functional blocks, activity. Implementation of legislation. Activity conclusions
Industrial Project. Plans	Structure and index of the plans. Type of representation: dimension and relationship. Title block. Sizes and scales. Folded. Example: layout drawings. Example: installation drawings. Schemes of principle. Symbology legend.
Industrial Project.	Budget and planning Measurement. Work units. Chapters Project management theory and planning. Gantt, CPM/PERT Agile methodologies.

basic construction elements Foundation.	Structural elements. Coatings. Carpentry shops. Covered. Finished. Floor and floor screed. Examples.
Methodology of design of installations	Methodology of design of installations Types of installations. Determination of loads. Load feeding elements. Elements of action, control and safety. Installation drawings and principle diagrams.
Specifications.	Types. Administrative Techniques Facultative Tendering and contracting of projects.
Legislation	Legislative order Interpretation of technical legislation General technical legislation applied the specialty
Other technical studies with own entity	Studies related to compliance with labor risk legislation. Studies related to compliance with waste management legislation. Other technical studies.
Professional activity	Regulated professions Free exercise of the profession Exercise of the profession for hire or reward. Exercise of the profession in public administration Project management Civil and professional liability Professional associations.
Industrial property rights	Technological innovation and industrial property. Patents and utility models.

## Planning

	Class hours	Hours outside the classroom	Total hours
Introductory activities	2	1	3
Lecturing	12	24	36
Presentation	2	4	6
Supervised work	2	6	8
Problem based learning	12	24	36
Problem solving	6	6	12
Computer practices	4	4	8
Problem based learning	8	24	32
Scientific events	1	4	5
Objective questions exam	0.5	1.5	2
Short answer tests	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	Students will be exposed, either individually or in groups, in front of the teacher and the rest of the class, contents of the subject, results of work done, etc.
Supervised work	Elaborate a technical report regarding any matter related to Industrial Engineering, with the quality and rigor that is expected of an Industrial Engineer.
Problem based learning	A work will be carried out applying the methodology of "Project Based Learning - PBL". 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	The student must develop the right or correct solutions to the exercises that are based on the theory taught. They will be realized applying formulas, algorithms or procedures of transformation available information. Interpretation of results will be necessary.
Computer practices	Activities of application of knowledge in a given context, and acquisition of basic and procedural skills in relation to the subject, through ICT.
Problem 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 attention

Methodologies	Description
Supervised work	The student, individually, prepares a technical report, or similar document, on a topic proposed by the teacher. The tutorials will be individual. The student's doubts will be clarified and he will be assisted in the organization and planning of the work. Small group tutoring can be done. Bringing together students with the same problem, for better efficiency.
Problem based learning	The student will carry out 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. Group lectures will be done with the teacher to clarify doubts and to follow up the work.
Scientific events	The teacher will work with the different groups of students to help them prepare the public exhibition of their work. Make several trials with them and guide them to get an effective presentation.

### Assessment

	Description	Qualification	Training and Learning Results
Presentation	Completion of 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.  An evaluation rubric will be published on the TEMA platform of the subject.	5	D3 D5 D17 D20
Supervised work	Prepare a technical report on any matter related to Industrial Engineering, with the quality and rigor expected from an Industrial Engineer.  An evaluation rubric will be published on the TEMA platform of the subject.	10	B1 D3 D5 D7 D8 D9 D10 D12 D15 D20
Problem based learning	Performing an interdisciplinary group work, with students of other subjects and degrees. This group, applying the methodology "design thinking" will make a work of implantation and / or improvement on a concrete activity.  An evaluation rubric will be published on the TEMA platform of the subject.	15	B1 B2 D2 D5 D7 D8 D9 D12 D14 D15 D17 D20
Problem based learning	Realisation of a project of *ingenieria, 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 published a *rubrica of evaluation in the platform FEAR of the *asignatura.	40	B1 B2 C18 D2 D3 D5 D7 D8 D9 D15 D17 D20

Scientific events	Presentation of the ideas developed by the students in the collaborative groups. This activity will be published and disseminated in different media.	10	D3 D5 D17 D20
	An evaluation rubric will be published on the TEMA platform of the subject.		
Objective questions exam	Proofs for evaluation of the competitions purchased that include enclosed questions with different alternative of answer. The students select an answer between a number limited of possibilities.	10	
Short answer tests	Proofs for evaluation of the competitions purchased that include direct questions on a concrete appearance. 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 avail himself of a non-continuous evaluation system must officially request it, within the period and manner established for that, in the E.E.I. If the student does not request and obtain the favorable verdict of the resignation to continuous evaluation, it is understood that it is in the continuous assessment system.

The student who intends to request the resignation of continuous evaluation should notify the teacher as soon as possible. It is recommended to do it 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 palaforma of the subject.

### CRITERIA FOR OVERCOMING THE MATTER THROUGH CONTINUOUS EVALUATION:

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To overcome the subject by means of the continuous evaluation, two conditions must be simultaneously fulfilled:

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 the continuous evaluation, must carry out a work supervised 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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The student is expected to exhibit appropriate ethical behavior.

When attending the course, the student acquires a commitment of teamwork, collaboration and respect to the classmates 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 does not meet the necessary requirements to overcome the subject. In this case the overall grade in this academic year will be suspended (0.0).

## Sources of information

## Basic Bibliography

El profesor de la asignatura, **Apuntes de Oficina Técnica**, Plataforma de teledocencia, 2017

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.ª edición, Ediciones Paraninfo, S.A, 2017

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

Francisco Javier González, **Manual para una eficiente dirección de proyectos y obras**, FC Editorial, 2014

Jesús Rosanes Soto, **CINCO PROYECTOS DE INGENIERIA ENERGETICA**, Bellisco Ediciones, 2016

Jesús Rosanes Soto, **CINCO PROYECTOS DE ORGANIZACION INDUSTRIAL**, Bellisco Ediciones, 2016

ARENAS REINA, JOSE MANUEL, **PRÁCTICAS Y PROBLEMAS DE OFICINA TÉCNICA**, LA FABRICA, 2011

Antonio Martínez Gabarrón, **Análisis y desarrollo de proyectos en la ingeniería alimentaria**, ECU, 2011

Meyers, **Diseño de instalaciones de manufactura y manejo de materiales**, Prentice Hall, 2006

Project Management Institute, **Guía de Los Fundamentos Para La Dirección de Proyectos (Guía del Pmbok )**, Quinta Edición, Pmbok#174, 2014

**Aprender AutoCad 2015 avanzado con 100 ejercicios prácticos**, Marcombo, 2015

Montaño la Cruz, Fernando, **Autocad 2017**, Anaya Multimedia, 2016

**Microsoft Project 2016**, Cornellà de Llobregat, 2016

**Microsoft Excel 2016**, Cornellà de Llobregat, 2016

## Recommendations

### Subjects that continue the syllabus

Final Year Dissertation/V12G330V01991

### Subjects that are recommended to be taken simultaneously

Enterprise assets management/V12G340V01922

Tools for organisation and business management/V12G340V01921

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

Graphic expression: Fundamentals of engineering graphics/V12G330V01101

Computer science: Computing for engineering/V12G330V01203

Business: Introduction to business management/V12G340V01201

Fundamentals of electrical engineering/V12G340V01303

Basics of operations management/V12G340V01405

Operations management/V12G340V01601