APPLICATION FORM FOR VERIFICATION OF OFFICIAL DEGREES
1. UNIVERSITY, CENTRE AND DEGREE TO THE APPLICATION

In accordance with Royal Decree 1393/2007, where the management of the Official University Education is established

UNIVERSITY APPLICANT	**CENTRE**	**CENTRE CODE**
University of Malaga	Higher Polytechnic School	29009119
LEVEL	**SHORT DESIGNATION**	
Degree	Industrial Electronic Engineering	
SPECIFIC DESIGNATION		
Industrial Electronic Engineering Degree by the University of Malaga		
BRANCH OF KNOWLEDGE		
Engineering and Architecture		
ASSOCIATED UNIVERSITIES	**AGREEMENT**	
No		
ENABLING TO EXERCISE A REGULATED PROFESSION	**ENABLING RULES**	
Yes	Orden CIN/351/2009, of February 9, BOE of February 20, 2009	
APPLICANT		
NAME AND SURNAMES	**POSITION**	
MARIA JOSE BLANCA MENA	Vice-Rector for Academic Affairs	
Type of Document	**Document Number**	
IDENTITY CARD	25084614D	
LEGAL REPRESENTATIVE		
NAME AND SURNAMES	**POSITION**	
MARA JOSE BLANCA MENA	Vice-Rector for Academic Affairs at the University of Malaga	
Type of Document	**Document Number**	
IDENTITY CARD	25084614D	
RESPONSIBLE FOR THE DEGREE		
NAME AND SURNAME	**POSITION**	
Alejandro Rodríguez Gómez	HIGHER POLYTECHNIC SCHOOL DEAN	
Type of Document	**Document number**	
IDENTITY CARD	33381949W	

2. ADDRESS FOR NOTIFICATION PURPOSES
In order to practice notifications of all procedures relating to this application, communications must be sent to the address shown in this paragraph.

ADDRESS	**POSTAL CODE**	**TOWNSHIP CITY**	**TELEPHONE**
C/ El Ejido s/n. PABELLÓN DE GOBIERNO DE LA UNIVERSITY OF MALAGA	29071	Malaga	952131038
E-MAIL	**PROVINCE**		**FAX**
blamen@uma.es	Malaga		952132694

3. PROTECTION OF PERSONAL DATA In compliance with the Personal Data Protection Organic Law 5/199, December 13th, Protection of Personal Data, we inform that the requested data in this Form are required for the processing of the application and will be processed automatically. The responsibility of the automated file is for the Council of Universities. Applicants who give data may apply to the Council the rights of information, access, rectification and cancellation which are referred to in Title III of the Law 5-1999, without prejudice with provisions of other legislation which protects those who give personal data.
The applicant acknowledges the terms and agrees to accomplish with de requirements thereof, and expressly consenting the notification by using telematics media to the purposes of Article 59 of the 30/1992 of November 26th, on Legal Regime of Public Administrations and the Common Administrative Procedure, as given by Law 4/1999 of January 13th release.

	Malaga, _____ (date)
	Signature: Legal Representative for the University

1. DESCRIPTION OF CERTIFICATE
1.1 BASIC DATA

LEVEL	SPECIFIC DESIGNATION	ASSOCIATED UNIVERSITIES	AGREEMENT	ATTACHED
Degree	Industrial Electronic Engineering Degree	NO		See annexes. Paragraph 1.

MENTIONS LIST
No data

BRANCH	ISCED 1	ISCED 2
Engineering and Architecture	Electronics and Control Engineering	Engineering and related professions

ENABLING FOR REGULATED PROFESSION:	Technical Industrial Engineer

RESOLUTION	Resolution of January 15, 2009, BOE January 29, 2009
NORM	Order CIN/351/2009, of February 9, BOE of February 20, 2009

ASSESSMENT AGENCY
Andalussian Agency for Quality Assessment and Accreditation (AGAE)

UNIVERSITY APPLICANT
University of Malaga

LIST OF UNIVERSITIES	
CODE	UNIVERSITY
011	University of Malaga

LIST OF FOREIGN UNIVERSITIES	
CODE	UNIVERSITY
No data	

LIST OF PARTICIPATING INSTITUTIONS
No data

1.2 DISTRIBUTION OF CREDITS IN THE DEGREE

TOTAL CREDITS	BASIC EDUCATION CREDITS	CREDITS IN INTERNSHIPS
240	60	0
OPTIONAL CREDITS	**COMPULSORY CREDITS**	**END OF DEGREE/ MASTER CREDITS**
30	138	12

LIST OF MENTIONS	
MENTION	OPTIONAL CREDITS
No data	

1.3 University of Malaga

1.3.1 CENTRES IN WHICH IS OFFERED

LIST OF CENTRES	
CODE	CENTRE
29009119	Higher Polytechnic School

1.3.2. Higher Polytechnic School

1.3.2.1 Data of the centre

TYPES OF TEACHINGS WHICH ARE LEARNED IN THE CENTRE		
ON-SITE CLASS	BLENDED LEARNING	ON-LINE
Yes	No	No

NEW OFFERED SEATS		
FIRST YEAR OF IMPLEMENTATION	SECOND YEAR OF IMPLEMENTATION	THIRD YEAR OF IMPLEMENTATION
125	125	125

FOURTH YEAR OF IMPLEMENTATION	FULL TIME	
125	ECTS MINIMUM ENROLLMENT	ECTS MAXIMUM ENROLLMENT
FIRST YEAR	60.0	240.0
REMAINING YEARS	48.0	240.0
	PART TIME	
	ECTS MINIMUM ENROLLMENT	ECTS MAXIMUM ENROLLMENT
FIRST YEAR	30.0	240.0
REMAINING YEARS	30.0	240.0
RULES FOR PERMANENCY		
http://www.uma.es/media/files/Normas_permanencia.pdf		
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	CATALAN	BASQUE
Yes	No	No
GALICIAN	VALENCIAN	ENGLISH
No	No	Yes
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	

2. JUSTIFICATION, ADEQUACY FOR PROPOSAL AND PROCEDURES

See annexes, paragraph 2.

3. COMPETENCES

3.1 CORE AND GENERAL COMPETENCES
CORE
CB1 – Ability to prove, recall and understand knowledge in a field of study which is supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, also includes some aspects which imply knowledge of the forefront of their area of study.
CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.
CB3 – Ability to gather and interpret relevant data (usually within their field of study) to make judgments including consideration on relevant social scientific or ethical aspects.
CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.
CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.
GENERAL
A1 – Ability to write, sign and develop projects in the field of industrial engineering which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energy facilities, electrical and electronic installations, installations and industrial plants and manufacturing-automation processes.
A2 – Ability for the management of the activities of engineering projects described in the previous section.
A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.
A5 – Knowledge to perform measurements, calculations, assessments, appraisals, expert calculations, studies, reports, work plans and similar work.
A6 – Ability to handle specifications, regulations and mandatory rules.
A7 – Ability to analyse and evaluate the social and environmental impact of technical solutions.
A8 – Ability to apply principles and methods of quality.
A9 – Ability to organise and schedule in the field of business and other institutions and organizations.
A10 – Ability to work in a multilingual and multidisciplinary environment.
A11 – Knowledge, understanding and ability to apply the necessary legislation in the exercise of the profession of Engineer.
3.2 CROSS-CURRICULUM COMPETENCES
No data
3.3 SPECIFIC COMPETENCES
B1 – Ability to solve mathematical problems which may arise in engineering. Ability to apply knowledge of linear algebra; geometry; differential and integral calculus; differential equations and partial derivatives; numerical methods; numerical algorithms; statistics and optimization.
B2 – Understanding and mastering the basic concepts of the general laws of mechanics, thermodynamics, electromagnetism and their application to solving engineering problems.
B3 – Basic knowledge of the use and programming of computers, operating systems, databases and computing programs with applications in engineering.
B4 – Ability to understand and apply the principles of basic knowledge of general chemistry, organic and inorganic chemistry and applications in engineering.

B5 – Ability for spatial vision and knowledge of graphic representation techniques, both traditional methods of metric and descriptive geometry, and geometry through applications of computer-aided design.
B6 – Adequate knowledge of the business concept, institutional and legal framework of the company. Organization and management companies.
C1 – Knowledge of applied thermodynamics and heat transfer. Basic principles and their applications to solving engineering problems.
C2 – Knowledge of the basic principles of fluid mechanics and their application to solving problems in the field of engineering. Pipes, channels and fluid systems calculations.
C3 – Knowledge of the fundamentals of science, technology and chemistry of materials. To understand the relationship among microstructures, synthesis or processing and properties of materials.
C4 – Knowledge and use of the principles of circuit theory and electrical machines.
C5 – Knowledge of the basics of electronics.
C6 – Knowledge of the basics of automation and control methods.
C7 – Knowledge of the principles of machines and mechanisms theory.
C8 – Knowledge and use of the principles of strength of materials.
C9 – Basic knowledge of production and manufacturing systems.
C10 – Basic knowledge and application of environmental technology and sustainability.
C11 – Applied knowledge of business management.
C12 – Knowledge and skills to organise and manage projects. Knowledge of the organizational structure and functions of a project office.
E1EI – Applied knowledge of electrotechnics.
E2EI – Knowledge of the basics and applications of analogue electronics.
E3EI – Knowledge of the basics and applications of digital electronics and microprocessors.
E4EI – Applied knowledge of power electrotechnics.
E5EI – Applied knowledge of electronic instrumentation.
E6EI – Ability to design digital, analogue and power electronic systems.
E7EI – Knowledge and ability to model and simulate systems.
E8EI – Knowledge of automatic regulation and control techniques and their application to industrial automation.
E9EI – Knowledge of principles and applications of robotic systems.
E10EI – Applied knowledge of industrial computing and communications.
E11EI – Ability to design control systems and industrial automation.
T1EI – Ability to tune industrial controllers and experimental identification of plants.
OEI1 – To understand logic gates at CMOS level and to design small systems using layout rules given by the manufacturer for ASICs FULL CUSTOM type.
OEI2 – Ability to design ASIC systems using high-level hardware description languages (VHDL specifically).
OEI3 – To understand the specificity of modelling languages and hardware simulation and to manage VHDL.
OEI4 – To understand the ability and different implementable solutions in FPGA systems and systems available on the market.

OEI5 – To understand the ability and different implementable solutions in FPGA systems and systems available on the market.
OEI6 – Ability to manage electronic instrumentation based on PCs.
OEI7 – Knowledge of the fundamentals and applications of sensing systems in industrial automation.
OEI8 – Ability to programming and integration of industrial manipulators in automated cells.
OEI9 – Knowledge and use of the principles of the health and safety at Work, techniques for assessing the risks of accidents, measures and adequate means for their prevention.
OEI10 – To know the responsibilities of the occurrence of accidents, features and methods in solving working disputes.
OEI11 – To understand the risk assessment of a company and its preventive measures.
OEI12 – To know the basics of scientific documentation and information sources in industrial hygiene. Knowledge of the fundamentals of occupational diseases research.
OEI13 – Basic knowledge of first aids in companies.
OEI14 – Knowledge and ability to apply knowledge of databases.
OEI15 – Basic knowledge of computer systems and programming aimed at industrial applications.
OEI16 – Ability to apply knowledge of mathematics, science and engineering to implement algorithms in programming language.
OEI17 – Basic knowledge of visual programming.
OEI18 – Knowledge of technological applications which have been developed from the principles of contemporary physics.
OEI19 – Ability to design and improve technological devices through the knowledge of the physical laws.
OEI20 – Knowledge, understanding and ability to design and manage production systems and industrial operations.
OEI21 – Basic knowledge and application of environmental technologies and sustainability.
OEI22 – Applied knowledge of business organization in industrial operations.
OEI23 – Knowledge and ability to organise, to manage and control projects.
OEI24 – Knowledge of industrial maintenance with emphasis on predictive maintenance.
EDP – Exercise to be performed individually and present and defend in front of an examination board. A project in the field of specific technologies of industrial engineering professional nature where the competencies/skills acquired in the degree teachings are synthesized and integrated.

4. ACCESS AND ADMISSION OF STUDENTS

4.1 PREVIOUS INFORMATION SYSTEMS

See annexes. Paragraph 3.

4.2 ENTRY REQUIREMENTS AND ADMISSION CRITERIA

4.2 ENTRY REQUIREMENTS AND ADMISSION CRITERIA

Article 42 of the Organic Law of Universities 6/2001 of December 21st, states that all the Spaniards have the right to study at the University, under the terms established in the legal system and for access to the University will need to be in possession of the Baccalaureate or equivalent. This article points out that, in addition, in all cases, and in accordance with the provisions of Article 38 of the Organic Law of Education 2/2006 of May 3rd, students will need to pass one only exam to access to university.

Despite the foregoing, paragraph 4 from Article 42 of the Organic Law of Universities establishes that, to facilitate retraining and reskilling and full and effective participation in cultural, economic and social life, the Government, prior Universities Council report, shall regulate the procedures to access the university of those who, proving a working or professional experience, do not have the educational degrees legally required to that effect. This access system, which will allow admission to any university, academic CENTRE and teaching CENTRE, under the conditions established for such purpose, by those who, unable to prove that experience, have exceeded a certain age.

In order to accommodate these and other forms of access to an official university degree and the procedure for admission to the Spanish public

universities, the Royal Decree 1892/2008, of November 14th (BOE[1] number 283, on 24-11-2008) has been dictated.

According to the provisions of the aforementioned Royal Decree to access official university degrees in Spanish universities, under the conditions for each case which are determined in the Royal Decree, those who accomplish one of the following requirements:

- Those who are in possession of the Baccalaureate to which Articles 37 and 50.2 of the Organic Law of Education 2/2006 of May 3rd, are referred and have passed the entrance examination related by the Article 38 of the aforementioned law. This test shall assess, along with their grades in high school, academic maturity, knowledge and ability of students to successfully follow university education. Chapter II of the Royal Decree we have been quoting, regulates the conditions of performance and features of the test, which shall be carried out, generally, at the university assigned to the secondary school in which the Baccalaureate was obtained.

- Those in possession of any of the degrees or certificates listed below, corresponding to syllabus of previous educational arrangements, or foreign studies certified or validated by the same and have passed the entrance test referred by the previous paragraph:
· Baccalaureate relevant to the organization of the education system regulated by the Organic Law 1/1990 of October 3rd, of General Organization of the Educational System.
· Supporting certificate of having passed the University Orientation Course.
· Supporting certificate of having passed the Pre-University Course.
· Any other degree that the Ministry of Education, Social Policy and Sport declares equivalent to the Baccalaureate regulated by the Organic Law of Education 2/2006 of May 3rd.

- Students from educational systems of Member States of the European Union or other countries with which Spain has signed international agreements in this regard, under Article 38.5 of the Organic Law of Education 2/2006 of May 3rd, that meet the requirements in their respective countries for university admission. These students may access the Spanish university in the same conditions as students who passed the admission test referred to in the preceding two paragraphs.

- Students from foreign education systems, prior application for approval of the origin degree to the Spanish Baccalaureate and passing the access test to university organised by the National Distance Education University (UNED).

- Those who are in possession of the degrees of Higher Technical corresponding to the teachings of Vocational and Artistic Education or Higher Sports Technician corresponding to Sports Education referred by the articles 44, 53 and 65 of the Organic Law of Education 2/2006. These students do not have to perform any access test.

- People over twenty-five years, according to the provisions of the additional twenty-fifth order of the Organic Law of Universities 6/2001 of December 21st. They may be able to access the official Undergraduate university teachings by passing an entrance exam. They may only attend that test access those who reach or have reached 25 years of age by October 1st of the calendar year in which this test is held, whose characteristics are regulated in Articles 28 to 35 of the Royal Decree.

- Those who accredit working and professional experience in accordance with the provisions of Article 42.4 of the Organic Law of Universities 6/2001 of December 21st, as amended by Law 4/2007 of April 12th. Candidates with working and professional experience related to these studies may access through this channel, with none enabling academic degree for university entrance in other ways and reach or have reached the age of 40 before October 1st of the academic year.

Access will be performed with respect to the specific teachings offered by the university, for which the applicant will address the application to the Chancellor of the university

The University of Malaga shall establish accreditation criteria and scope of the working and professional experience related to any of the undergraduate courses, so as to allow applicants to order. Such criteria shall include, in any case, a personal interview with the candidate.

- People over forty-five years, according to the provisions of Article 42.4 of the Organic Law of universities 6/2001 of December 21st, as amended by Law 4/2007 of April 12th. They will have to pass an entrance test whose characteristics are detailed in Articles 37-44 of Royal Decree 1892/2008; not possessing any academic degrees enabling access to the university by other means; and being unable to accredit working and professional experience.

- Those in possession of an official university undergraduate degree or equivalent.

- Those who are in possession of an official university bachelor's degree, Technical Architect, Technical Engineer, Graduate, Architect, Engineer, corresponding to the previous organization of university education or equivalent.

- Those who have completed partial abroad university studies, or have concluded them, do not have obtained their official approval in Spain and wish to continue studies in a Spanish university. In this case, at least 30 credits should be recognized by the corresponding University.

Access to the Spanish university from any of the events just related will be carried out in full respect of fundamental rights and principles of equality, merit and ability.

Likewise the principles of universal accessibility and design for all will be considered as established in the Law 51/2003 of December 2nd, of equal opportunities, non-discrimination and universal accessibility for people with disabilities.

Likewise, it will be ensured that the admission of students to the official university degree is general, objective and universal, valid in all Spanish universities and satisfies the criteria in line with the European Higher Education Area.

As established in the Single Transitional Provision of Royal Decree 1892/2008 and in accordance with Article 17 of Royal Decree 806/2006 of June 30th, by which the implementation calendar of the new education system ordinance is established by the Organic Law 2/2006 of June 3rd, on Education, the entrance test regulated by Chapter II of this Royal Decree 1892/2008 shall be applied from the academic year 2009-2010. Until the end of the academic year 2008-09 shall be applicable the Royal Decree 1640/1999, of October 22nd, by which the entrance test to university studies is regulated, as amended and supplemented by Royal Decrees 990/2000, of June 2nd, 1025/2002, of October 4th and Royal Decree 406/1988, of April 29th, on the organization of the aptitude tests for access to faculties, technical schools and university colleges, and composition of the examination board as amended by Royal Decree 807/1993, of May 28th.

According to the provisions of the Article 17 of Royal Decree 806/2006, of June 30th, by which the implementation calendar of the new education system is established by the Organic Law 2/2006 of June 3rd, on Education, amended by the first final provision of Royal Decree 1467/2007, of November 2nd, by which the Baccalaureate structure is established and its minimum teachings are set, the entrance test regulated by Chapter III of the Royal Decree 1892/2008, shall be applied from October 1st, 2009. Until September 30th of 2009, shall be applicable the Order of June 12th, 1992, by which the aptitude tests for students with recognized foreign studies to access to Faculties, Higher Technical Schools and University Colleges are regulated,

[1] BOE: en español, Boletín Oficial del Estado.

amended by Order of May 13th, 1993, and the Order of May 4th, 1994.

The entrance test for people over 25 years, regulated by Article 28 of Royal Decree 1892/2008, shall be applicable from January 1st, 2010. Until December 31st, 2009, the provisions of Royal Decree 743/2003, of June 20th, shall be applied by which the entrance test to the University for people over 25 years is regulated.

The entrance test for people over 25 years, regulated by Article 28 of Royal Decree 1892/2008, shall be applicable from January 1st, 2010. Until December 31st, 2009, the provisions of Royal Decree 743/2003, of June 20th, shall be applied by which the entrance test to the University for people over 25 years is regulated.

The access of undergraduates regulated by Article 26 of Royal Decree 1892/2008 shall be applied to the admission procedures to the university from the academic year 2010-2011. Until that time the calculation of the admission punctuation to official university degree teachings shall be performed according to the provisions of the Resolution of June 4th, 2001, by the General Directorate of Universities, by which the rules for the calculation of the average punctuation on the academic record of students who access university teachings leading to obtain official degrees since Vocational Training, according to the pre-emption provisions established in Annex II of Royal Decree 1892/2008.

Access through accreditation of working and professional experience, in order to take official university degree teachings, regulated by Article 36 of Royal Decree 1892/2008, shall be applied to the admission procedures to the university from the academic year 2010-2011.

Access to university for older than 45 years, in order to take official university degree teachings, regulated by articles 37-44 of Royal Decree 1892/2008, shall be applied to the admission procedures to the university from the academic year 2010- 2011.

In addition to accredit the established requirements for access to university for some of the paths just noted, the admission request to perform some specific studies shall be carried out according to the procedure described in Chapter VI of Royal Decree 1892/2008. In this regard it should be observed that place booking quotas are established for certain paths of reservation, in the percentages indicated in the following table:

WAY OF ACCESS	% MINIMUM	% MAXIMUM
Older than 25 years	2%	-----
Older than 45 years and older than 40 with working experience	1%	3%
Students with university degree or equivalent	1%	3%

Furthermore, five percent of the seats available for students who have recognized a degree of disability equal or superior to thirty three percent and for students with permanent special educational needs associated with personal circumstances of disability is set aside, while during their previous education have needed resources and support for their full educational standards.

Also, a minimum rate of three percent of the positions offered by the universities shall be reserved for those who accredit their status as top-level or high performance athletes and meet the corresponding academic requirements. The institutions providing studies and teachings referred by the fourth paragraph of section 1 of Article 9 of Royal Decree 971/2007 of July 13th, on high-level and high performance athletes, shall reserve an additional quota equal to at least five percent available places for these athletes, although this quota may be increased.

According to the provisions of article 75 of Andalussian Law of Universities 15/2003, for the sole purposes of admission to the university CENTREs, all Andalussian public universities constitute a single district, tending to avoid the requirement of several EVALUATION tests. The performances to be undertaken for this purpose shall be carried out by a technical committee of the Andalussian Council of Universities.

Conditions or special access test to the degree to which this report refers have not been established.

Despite the above, the recommended entry profile should be:
· Good previous education in mathematics and physics
· Skill and speed for numeric calculation and solving quantifiable problems
· Ability to observation and analysis
· Logical and abstract reasoning
· Personal attitude of initiative
· Ability to establish relationships between observed reality and the description of it by mathematical models
· Ability to team cooperation
· Personal work organization
· Ability to work under pressure
· Ability to solve problems with initiative, decision making, creativity and critical thinking
· Leadership, responsibility and caring for the practical application of knowledge to solve real problems
· Manual skill in handling instruments or equipment
· High capacity for mobility and integration in different working environments, multidisciplinary and multilingual
· High communication capability
· Versatility to manage new situations

According to the established in the Single Transitional Provision of Royal Decree 1892/2008, Chapter VI, on admission to the Spanish public universities, this will be applied to the admission procedures to university from the academic year 2010-2011. Until having reached that point, admissions of students in the Andalussian universities are governed by the rules agreed by the Commission of University Unique District of Andalusia.

On the Internet address, **http://www.infouma.uma.es/acceso/preinscripcion/default.htm**, future students shall find accurate information about access and admission systems.

4.3 SUPPORT FOR STUDENTS

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4.3.1 Welcoming to the new students.
Hosting action: academic event in which the Management Team of the High Polytechnic University School welcomes the new students of all degrees. It is performed the day before the first official class and in this event all members of the management team are presented, explaining the functions of each one of them. Also allusions are made to the CENTRE infrastructure, information technology, website, ON-LINE campus of the University of Malaga and questions that may arise are answered. It also has the presence of representatives of the delegation of students and the Dean of the College of Experts and Industrial Engineers of Malaga.

4.3.2. Centre support and guidance to students once enrolled.

Once students are enrolled, they will receive a CD in which they can find all the information about the CENTRE and the syllabus of their degrees: career opportunities, schedules, exam schedule, access requirements to the degree, etc. Also, this CD collects important aspects of the convergence process to European Higher Education Area within the branch of engineering and in particular the sub-branch of industrial engineering.

4.3.3. Support and guidance for foreign students.

Exchange students welcomed in the UMA from partner universities are assigned an academic coordinator and, upon request, a volunteer student who shall be a companion tutor, facilitating integration into the university and academic life at the University of Malaga.

Some welcomed students, according to agreement with their home university, shall be provided and sometimes subsidized accommodation and meals from the budget of International Development Cooperation.

4.3.4. Specific support for students with disabilities.

The University of Malaga considers that attention to the educational needs of students with disabilities is a recognition of the values of the person and their right to higher education. For this reason and with the objectives of: a) to ensure equal opportunities and full integration of disabled university students in academic life and b) to promote sensitivity and awareness of other members of the university community, the University of Malaga that, through its Vice-Chancellorship of Social Welfare and Equality, offers an office intended to the assistance of their students with disabilities: Support Service for Students with Disabilities (SAAD[2]).

This service is intended to guide and assist people with a disability percentage similar or higher than 33%, wishing to enter or are enrolled in the University of Malaga, trying to solve the needs arising from the student's disability situation that hinder the development of their university studies and can put them in a disadvantaged position. These needs vary depending on the person, TYPE of disability, studies performed, and socio-economic status, so it will be necessary to conduct an assessment and individualized attention to each student.

Below, some examples of resources are listed. They are illustrative, since, depending on the student with disabilities may arise new measures or vary the nature of the currently existing:

- Academic and vocational guidance and counselling to students and parents.
- Curricular adaptations in coordination and collaboration with the competent faculty.
- Technical aids for curricular access: recorders, carbonless notebooks, FM transmitters...
- Seat reservation in classrooms and university gauging.
- Sign language interpreter.
- Adaptation of Classroom material: A bench, desks, chairs...
- Adaptation of class material: notes, practice.
- Financial support for transport.

4.4 TRANSFER SYSTEM AND RECOGNITION OF CREDITS

Recognition of credits in Superior Officers non-University Teachings

MINIMUM	MAXIMUM
0	228

Recognition of credits in Degrees.

MINIMUM	MAXIMUM
0	36

Detailed Specific Degree

See annexes. Paragraph 4.

Recognition of credits obtained by Accreditation and Professional Experience

MINIMUM	MAXIMUM
0	36

The Royal Decree 1393/2007 of October 29th, by which the ordinance of official university education is established, provides in Article 6 that in order to make effective the mobility of students, both inside and outside the country, universities shall elaborate and make public their regulations on the credits recognition and transfer system, subject to the general criteria established in this regard in the aforementioned Royal Decree.

In compliance with this, the University of Malaga, through the agreement of the Government Council, adopted at the meeting held on June 23th, 2011, and published in the BOJA dated August 2nd, 2011, has established the "Guiding rules of studies or activities recognition, and working or professional experience, for the purpose of obtaining official university degrees of Undergraduate and University Master as well as credits transference."

Recollecting the provisions of Royal Decree 1393/2007, the quoted rules contemplate the possibility of recognition of the following studies and/or activities:

• Subjects and/or credits obtained, corresponding to studies leading to university degrees of official value throughout the national territory, undertaken in university centres.
• Studied subjects, corresponding to other university degrees different from the ones of official value throughout the national territory.
• Studied subjects, corresponding to higher artistic education.
• Studied subjects, corresponding to advanced vocational education.
• Studied subjects, corresponding to professional plastic arts and design higher education.
• Studied subjects, corresponding to sports higher education.
• Work experience resulting from participation in Cooperative Education Programs (Internships).
• Work or professional experience non related to Educational Cooperation Programmes.
• Participation in cultural, sporting, student representation, charity and cooperation university activities.

[2] SAAD: En español, Servicio de Apoyo al Alumnado con Discapacidad

Those who possess student status with open academic record in the corresponding degree of the University of Malaga may request the corresponding recognition of studies, activities or professional experience during the corresponding enrolment period (for new students in the respective Centre and degree of the University of Malaga), or during the month of March of each academic year (for students already enrolled in that Centre and Degree).

Applications for studies or professional experience recognition shall be resolved by the Dean or Director of the corresponding Centre after a report of "Recognitions Committee" of the corresponding degree on the suitability between the acquired and alleged COMPETENCES and knowledge, and those required by the corresponding syllabus at the University of Malaga, and in accordance with the following criteria:

• In no case the Final Degree Projects may be recognised or validated.

• When the degree of origin and destination belong to the same branch of knowledge, the alleged credits obtained in subjects considered as basic training of the quoted branch of knowledge shall be recognised in accordance with the provisions of Annex II of the Royal Decree 1393/2007. In the event the credits corresponding to all basic subjects of the origin degree, recognition of at least 36 of those credits shall be ensured.

• When the degree of origin and destination belong to different branches of knowledge, shall be recognised the alleged credits obtained in subjects considered as basic training for the branch of knowledge to which the degree of destination belongs, in accordance with the provisions of Annex II of Royal Decree 1393/2007.

• They shall not be recognised the credits obtained in the degree of origin by validation or count, where they have been recognised for the same degree of destination the studies that originated the aforementioned validation or count, and vice versa.

• Credits obtained in other degrees other than those of official status shall not be recognised in a number greater than 15% of the total of the degree of destination, except in the case referred by the article 6.4 of the Royal Decree 1393/2007 (the degree has been extinguished and replaced by the official degree).

• It shall not be possible to recognise (non-university) official higher education which has been used by the applicant for access to the degree of destination.

• The recognition of accredited working or professional experience not related to Educational Cooperation Programmes, shall be made taking into account the relationship with the COMPETENCES inherent to the degree, and shall be counted at the rate of one credit for each accredited year. In the case of work experience related to Educational Cooperation Programmes, the count shall be performed at a rate of one credit for every twenty-five accredited hours. In both cases, the number of counted credits may not exceed 15% of the total of the corresponding degree.

The recognition applications for participating in university cultural, sports, student representation, solidarity and cooperation activities, shall be resolved by the sole Government body of the University of Malaga with COMPETENCES in each one of the quoted subjects, according to the following criteria:

• It shall only be possible the recognition for those degrees in whose syllabus this possibility is expressly contemplated.

• It shall only be possible the recognition of carried out activities after the first enrolment into the CENTRE and degree of the University of Malaga to which the respective recognition is wished to apply.

• It shall not be possible to recognise a higher number of credits above 5% of the total of destination degree altogether.

• Within the limit prescribed in the preceding paragraph, a credit shall be counted every 25 hours of participation in university cultural, sports, student representation, solidarity and cooperation activities.

• Studies of specialization, updating and continuous or permanent training or postgraduate shall be considered as university cultural activities while accredited by other degrees issued by the University of Malaga, as well as activities of academic and/or professional orientation organised by the University.

• They may be considered as university cultural activities those courses organised by the foundations promoted by the University of Malaga.

• They shall only be considered university activities of student representation those one belonging to collegiate government bodies and/or representation of a Spanish University, or fees arising from those, provided by the University Statutes or theirs implementing rules.

Furthermore, these rules provide for the possibility, at the request of the corresponding student, of credit transfer, understood as the constancy in the academic record of all the credits obtained by the student in official teachings corresponding to the order established by the Royal Decree 1393/2007, previously studied in the same or another University, and have not led to the obtaining of an official degree.

4.5 COURSE OF ADAPTATION FOR GRADUATES

1. ADAPTATION COURSE DESCRIPTION.

1.0 DESIGNATION

UNIVERSITY EXPERT OF ADAPTATION TO THE DEGREE IN INDUSTRIAL ELECTRONIC ENGINEERING

1.0.1 STUDY TYPE

	MASTER (60 credits minimum)
x	EXPERT (30 credits minimum)

1.0.2 FIELD

	Health Sciences
	Sciences
	Social and Legal Sciences
	Art and Humanities

x	Engineering and Architecture

1.1 CENTRE/S WHERE TEACHING TAKES PLACE

1.1.1 Place of teaching (Classroom, on-line campus...)
(Space reservation will be detailed)

HIGHER POLYTECHNIC SCHOOL

1.2 TYPE OF TEACHING

	In person class	x	Blended learning		On-Line

1.3. INFORMATION WEBSITE FOR STUDENTS:

http://www.uma.es/vrue/tpropias/index.html

1.4. ACADEMIC DIRECTOR

Name and surname:

	NIF:
ALEJANDRO RODRÍGUEZ GÓMEZ	33381949-W

Category:

Lecturer	

Knowledge Area:

ELECTRIC ENGINEERING

Department:

ELECTRIC ENGINEERING

Signature: ALEJANDRO RODRÍGUEZ GÓMEZ

ACADEMIC VICE- RECTOR

Name and surname:

	NIF:
FERNÁNDEZ GUTIÉRREZ, ALBERTO	52576058-J

Category

Senior Professor	

KNOWLEDGE AREA

THERMAL ENGINES AND MACHINES

DEPARTMENT

THERMAL ENGINES AND MACHINES

Signature: ALBERTO FERNÁNDEZ GUTIÉRREZ

CONTACT DATA AND INFORMATION

Phone number/s:

	E-mail:
951952310	inmaruiz@uma.es

1.5 NUMBER OF OFFERED SEATS

Minimum number of students:	15	Maximum number of students:	30

1.6. Number of offered European credits of the degree	36 ECTS

1.7. BRIEF DESCRIPTION OF THE COURSE

A blended learning course which provides the necessary competences to complete the formation for graduates in Industrial Engineering specialty of Electronics opting to next Degree in Industrial Electronic Engineering.

1.8 SYLLABUS

Module I: Competential updating with 36 ECTS divided into six subjects of 6 ECTS each: Fluid Mechanics, Materials Science, Strength of Materials, Manufacturing Engineering, Analysis of Electrical Networks, Industrial Automation.

1.9. DURATION:

Start Date	End Date	Timetable
October 4, 2013	February 28, 2014	Friday: 17:00/21:30 h; Saturday: 8:45/14:15 h.

Information for pre-admission

http://www.juntadeandalucia.es/economiainnovacioncienciayempleo/

Application period:

Start date	End Date
September 9, 2013	September 21, 2013

Enrolment period:

Start date	End date
September 23, 2013	September 27, 2013

1.10. PRICES AND TIME LIMITS:

DEGREE	Price per credit	Total price	Number of credits
MASTER	€	€	
EXPERT	26€	936€	36 ECTS

Instalment payment	Yes x No
Number of Payments / Payment Deadline	Amount
Pre- registration: SEPTEMBER 25	300 €
1st period: OCTOBER 3	318€
2nd period: NOVEMBER 3	318€

2. JUSTIFICATION

2.1. Justification of the proposed DEGREE, claiming academic, scientific or professional interest

The Royal Decree 1393/2007, of October 29th (BOE of October 30th), by which the ordinance of official university education is established, in its Fourth Additional Provision, section 3, indicates that those being in possession of an official DEGREE, Technical Architect or Technical Engineer, and intend to take lessons aimed at obtaining an official university Degree, shall obtain recognition of applicable credits in accordance with the provisions of Article 13 of the aforementioned Royal Decree, giving to it powers to universities which may make such recognition, based on the correlation between the COMPETENCES and knowledge associated with the remaining subjects studied by the applicant. This point has been the subject of a report, dated November 20th, 2009, the Subdirectorate General of Academic Coordination and Legal System of the Directorate General of University Policy of the General Secretariat of Universities, Ministry of Education.

In the sense described in the preceding paragraph, it must be considered:

1) The curricula being phased out are governed by RD 1402/1992, 1403/1992, 1404/1992, 1405/1992 and RD 1462/1990 of November 20th, by which the typical general guidelines of study leading to the award of degrees of Technical Engineer in Electricity, Industrial Electronics, Mechanics, Industrial Chemistry and Industrial Design are established. In these RD is established, first, that the global teaching load in no case shall be less than 205 credits or greater than the maximum of credits RD 1497/1987 allows for first-stage studies in the DEGREEs of Technical Industrial Engineering (Electricity, Industrial Electronics, Mechanics, Industrial Chemistry). On the other hand, it is established that the global teaching load in the degree of Technical Engineering in Industrial Design in no case shall have less than 180 credits.

2) The curricula (corresponding to the degrees of Technical Industrial Engineering, in its different specialties, and the degree of Technical Engineering in Industrial Design) were planned and developed at the Public University System of Andalusia, with a minimum of 217 credits, and specifically 225 at the University of Malaga.

3) The RD 1497/1987 in Article 7.3b) stated that the percentage of free choice credits for the curriculum of these students may not be less than 10% of the overall teaching load of the curriculum leading to the award of the official degree in question. All degrees of Technical Industrial Engineering and Technical Engineering in Industrial Design of the Public University System of Andalusia have a load of 10% of LRU credits corresponding to free choice subjects.

4) All Technical Engineering degrees contemplate as basic subject the End of Degree Project.

5) The RD 1954/1994 of September 30th, on recognition of DEGREEs to the catalogue of Official University Degrees, created by the RD 1497/1987 of

November 27th.

Since previous studies, to the entry into force of RD 1393/2007, keep all their academic and professional purposes, the degree of the previous academic system shall be recognised in full, and therefore, taking into account the above considerations, it is only fair that any degree in Technical Engineering of the Industrial Branch had a recognition between 203 and 212 ECTS credits.

The above, together with the analysis of skills to acquire, implies to plan an adaptation course in which each Degree in Technical Industrial Engineering or Technical Engineering in Industrial Design, had a specific timetable for a maximum of 48 ECTS credits (a total of 36 ECTS credits in basic subjects, plus 12 ECTS credits corresponding to the Final Degree Project) which would serve to develop the skills not covered by the DEGREEs to be phased out and introduced in the degrees of Engineering of the Industrial Branch. This precise timetable will depend on the specific studied technology (industrial design, industrial electronics, electricity, mechanics or industrial chemistry). The skills to be developed in each specific timetable of the Adaptation Course would be focused primarily on the training COMPETENCES common to the industrial branch or product engineering.

The credits recognition of their degree and the completion of the Adaptation Course should give access, if you meet the academic requirements provided by the Verification Report of Engineering DEGREE of the Industrial Branch to which access is sought, to the Degree.

The proposed Adaptation Course includes a total of 36 credits, then is REQUIRED the completion of the End of Degree Project.

AND COMPETENCES

3.1. Objectives reflecting the overall orientation of the degree

General purpose:

- Curricular adaptation to the training plan of new degrees within the European Higher Education Area in the field of Industrial Engineering branch.

Specific objectives:

- To increase knowledge and general training in the industrial sector.

- To update the Technical Industrial Engineers specialized in Industrial Electronics into new COMPETENCES emerged after the implementation of the new degrees within the European Higher Education Area.

3.2. General and specific COMPETENCES that students should acquire during their studies and are required to grant the DEGREE

The COMPETENCES included here were agreed at the meeting of March 25th, 2011, of School Principals of the Andalussian Public University System that provide Technical Engineering DEGREEs. These COMPETENCES were selected from the Ministerial Order CIN/351/2009, collecting all those who were not covered by any of the Technical Engineering DEGREEs of the aforementioned Schools, so that each of them, within their university scope and their DEGREEs, may establish what compulsory subjects should be part of the adaptation course, thus completing the corresponding degree COMPETENCES. The study of these COMPETENCES was set in agreement with the Recognition Committee and subsequent approval by the Centre Board of the Higher Polytechnic School of the University of Malaga, on the date of November 26th, 2012.

COMPETENCE	DEFINITION
GENERAL COMPETENCES RD 1393/2007	• Ability to prove, recall and understand knowledge in the area of Electrical Engineering and Industrial branch of the base of general secondary education, and is typically at a level which, although it is supported by advanced textbooks also includes some aspects which imply knowledge of the vanguard of Electrical Engineering and Industrial branch. • Ability to apply their knowledge to their work or vocation in a professional way and have competences typically demonstrated through devising and defending arguments and solving problems within Electrical Engineering and Industrial branch. • Ability to communicate information, ideas, problems and solutions to both specialist and non-specialist audience. • Students should have developed the skills needed to undertake further study with a high level of autonomy.
CORE COMPETENCIES OM CIN 351/2009	• Ability to write, sign and develop projects in the field of industrial engineering aimed, according to the knowledge acquired as core competencies formation, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energetic facilities, electrical and electronic installations, installations and industrial plants and manufacturing processes and automation. • Knowledge in basic and technological aspects to enable them to learn new methods and theories and equip them with versatility to adapt to new situations. • Ability to solve problems with initiative, decision making, creativity, critical thinking and to communicate and transmit knowledge and skills in the field of Industrial Engineering. • Knowledge to perform measurements, calculations, valuations, appraisals, professional reports, studies,

	reports, work plans and other similar work. • Ability to manage specifications, regulations and obligatory standards. • Ability to work in a multilingual and multidisciplinary environment.
SPECIFIC COMPETENCIES OM CIN 351/2009	• Knowledge of the basic principles of fluid mechanics and their application to solve problems in the field of engineering. Calculating pipes, channels and fluid systems. • Knowledge of the fundamentals of science, technology and chemical of materials. To understand the relationship between microstructure, synthesis or processing and material properties. • Knowledge of the principles of machines and mechanisms theory. • Knowledge and use of the principles of strength of materials. • Basic knowledge of production and manufacturing systems. • Basic knowledge and application of environmental technologies and sustainability. • Applied knowledge of electrotechnics. • Knowledge of principles and applications of robotic systems. • Ability to design control systems and industrial automation.

4.1 Information system, prior to registration and admission procedure and guidance to new students

PRIOR INFORMATION SYSTEM

A. Information available on the website of the Centre: www.politecnica.uma.es in the specific section of Adaptation to Degree.

B. Information Day. An information day on the specific course of adaptation as well as other alternatives will be performed. The corresponding call of the day will be carried out through the existing pathways for graduates, supported by the social partners for the broadest possible diffusion among those who are in possession of the respective Title under the previous regulations.

C. Informative Diptychs. Several informative diptychs will be created to inform about the pathways of adaptation and this Adaptation Course

To participate in the admission process at any Curricular Itinerary

An application for registration in an Adaptation Course taught in Andalussian Public Universities will need to be completed and submitted on the following electronic access point:

http://www.juntadeandalucia.es/economiainnovacioncienciayempleo/

University CENTRE can determine the registration limits for each itinerary and more than one period during the academic year.

The registration periods will be published on the electronic access point mentioned in the previous point, at least 15 days in advance and will be open for a period of non less than one week. Universities also make public such periods on the notice boards of their Admission Offices:

University of Malaga. Access Office. Campus Teatinos, s/n. 29071-Malaga.

WELCOMING PROCEDURE AND GUIDANCE

An academic event is performed where the Academic Directorate of the degree welcomes participants to the Adaptation Course. It is performed before the first official day of class and in this act of presentation of the course, arrangement thereof, participant professors, centre infrastructure, computer media, website, ON-LINE campus of the University of Malaga and then some question time.

4.2 Access requirements and conditions or special Access tests

Accessing the university education is an act regulated by the RD 1892/2008, of November 14 which regulates and provides in Article 4.1, defining it as the guiding principle of access to the Spanish University, which will take place from any of the cases which the royal Decree refers to "full respect for fundamental rights and the principles of equality, merit and ability".
Accessing by the special way and contained in Resolution of the Directorate General of Universities laying in the agreement of February 6, 2013 of the Commission's Single District College student of Andalucía for the admission procedure is set to specific curricular itineraries for those having a degree of technical architect, engineer, graduate or teacher intending to obtain the degree. http://www.juntadeandalucia.es/boja/2013/42/14

This adaptation course can only be accessed by applicants with a degree in Technical Industrial Engineering Mechanical specialties, obtained according to plans regulated by the Organic Law 11/1983 studies, August 25, University Reform, making the adaptation course to access the degree according to the Organic Law 6/2001 of 21 December, on Universities.
Applicants must apply for registration and be in possession of a degree of Technical Industrial Engineering specialty in Electronics.

Access. Percentage of reservation of seats for those accrediting disability.

It is required to keep a 5 per cent of the offered seats to those who justify any disabling condition in an equal or higher than 33 percent grade

4.3 Criteria for selection of students if applications exceed the number of seats

- 60% academic records in the degree of origin.

- 40% Professional experience (only related to the degree).

The assessment is carried out based on a maximum of 10 points, 6 for the academic record and 4 for working experience.

The record is assessed on the maximum possible basic in this section, accounting for up to 6 points on the total of 10.

The valuation of professional experience is assessed based on a maximum of 4 out of 10. When an applicant exceeds the maximum basic in this section, he/she shall be given the maximum level, while the valuation of the other contestants will be proportionately. Therefore both, the achieved score as the total score gotten in the year must be regarded solely as a relative measure established with respect to other candidates in the same competition. For the same reason, in any case that score can be extrapolated or comparable with that obtained in one or more other competitions where each candidate takes part.

4.4 SUPPORT AND GUIDANCE TO STUDENTS, ONCE REGISTERED.

Once registered, students are informed of the structure and organization of the degree and the different communication ways to move any impacts on the development of the degree.

SPECIFIC SUPPORT FOR STUDENTS WITH DISABILITIES

The University of Malaga considers that attention to the educational needs of students with disabilities is a recognition of the values of the person and their right to a higher education. For this reason there is an office for the attention of students with disabilities: Support Service to Students with Disabilities (SAAD).

4.5 Selection criteria for awarding grants

Income.

Academic performance in the course

4.6 Transfer and credit recognition

According to RD. 1393/2007 of October 29, by which the management of the Official University Education is established, and RD. 861/2010, on July 2, approving the modification of the latter, the recognition of credits from the professional experience and unofficial teachings, will not exceed 15% of the total credits to constitute the Syllabus.

Considering that the Degree in Electronic Engineering includes 240 credits, the maximum credits that could recognize are 36 credits.

As it is reflected in the agreement of the Committee of Degrees of the Industrial Branch in the University System Andalussian Public, the Academic Committee belonging to the body responsible for the Adaptation Course will perform the recognition of professional activity based on reports issued by the corresponding social partners, the Official College of Expertises and Industrial Engineers or, alternatively, the Public Administration.

The equivalence for recognition is 2 ECTS per year of work experience related to the profession and related to inherent COMPETENCES in the subjects.

Distribution of the Syllabus in European credits

TEACHING METHODS	EUROPEAN CREDITS
Theory /practical teaching in Classroom	24 ECTS
Teaching on-line	12 ECTS
Work placements in companies	0 ECTS
Final Degree Project for Adaptation Course	0 ECTS
EUROPEAN TOTAL CREDITS	36 ECTS
Total hours of class (theory /practice)	180
Total hours of students work (25 hours x 1 credit)	900

5.1.2. General explanation of the Syllabus planning

- Monitoring activities and study

- Theoretical and practical teaching material

- Problems

- Further reading

- Training test and / or assessment of each module / subject

- Consultations by email and / or discussion forums
This structure will allow to acquire the skills for each subject that will be evaluated by, at least, four partial exams for each of the subjects, as included in "5.2.4. Assessment and DEGREE systems.

5.2. Detailed description of the modules / subjects / subjects of the teachings in the Syllabus

GENERAL INFORMATION	
Designation of the Module	Module: **Competences updated. Subjects**: Fluid Mechanics, Materials Science, Strength of Materials, Manufacturing Engineering, Analysis of Electrical Networks and Industrial Automation.
Number of European Credits (on-site class**/e-learning): 36 ECTS (6 ECTS each subject). Blended learning.**	
Nature (Required / Optional): Required	
Temporary Unit: Semester	

5.2.1 COMPETENCES

COMPETENCES	DEFINITION
GENERIC COMPETENCES RD 1393/2007	• Ability to prove, recall and understand knowledge in the area of Electrical Engineering and Industrial branch of the base of general secondary education, and is typically at a level which, although it is supported by advanced textbooks also includes some aspects which imply knowledge of the vanguard of Electrical Engineering and Industrial branch. • Ability to apply their knowledge to their work or vocation in a professional way and have competences typically demonstrated through devising and defending arguments and solving problems within Electrical Engineering and Industrial branch. • Ability to communicate information, ideas, problems and solutions to both specialist and non-specialist audience. • Students should have developed the skills needed to undertake further study with a high level of autonomy.
CORE COMPETENCIES OM CIN 351/2009	• Ability to write, sign and develop projects in the field of industrial engineering aimed, according to the knowledge acquired as core competencies formation, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energetic facilities, electrical and electronic installations, installations and industrial plants and manufacturing processes and automation. • Knowledge in basic and technological aspects to enable them to learn new methods and theories and equip them with versatility to adapt to new situations. • Ability to solve problems with initiative, decision making, creativity, critical thinking and to communicate and transmit knowledge and skills in the field of Industrial Engineering. • Knowledge to perform measurements, calculations, valuations, appraisals, professional reports, studies, reports, work plans and other similar work. • Ability to manage specifications, regulations and obligatory standards. • Ability to work in a multilingual and multidisciplinary environment.
SPECIFIC COMPETENCIES OM CIN 351/2009	• Knowledge of the basic principles of fluid mechanics and their application to solve problems in the field of engineering. Calculating pipes, channels and fluid systems. • Knowledge of the fundamentals of science, technology and chemical of materials. To understand the relationship between microstructure, synthesis or processing and material properties. • Knowledge of the principles of machines and mechanisms theory. • Knowledge and use of the principles of strength of materials.

	• Basic knowledge of production and manufacturing systems. • Basic knowledge and application of environmental technologies and sustainability. • Applied knowledge of electrotechnics. • Knowledge of principles and applications of robotic systems. • Ability to design control systems and industrial automation.

5.2.2 Learning activities and their relationship with the competences to be acquired by the student

- Theoretical and practical on-site classes where the necessary knowledge for the achievement of cognitive and comprehensive competences is transmitted.

- Self-study which allows the student to develop the necessary skills of learning and application of knowledge.

- Performance of work, projects or reports to ensure the competences of solving engineering problems with restrictive conditions and develop the attitudinal and attitudinal competences.

- Assessment, which will ensure the achievement of the specific competences.

5.2.3 Coordination actions (if required)

The academic leadership will handle the task of coordinating the subjects comprising the adaptation degree.

For this a meeting will be require with the participating professors before the course starts to program the sequence of contents, establishing teaching of students and temporarily coordinate assessments and work required in the different subjects.

5.2.4 Assessment and qualifications systems.

This is an adaptation of a degree in Technical Engineering to the new degree so the aims is to ensure that the professional acquires those skills appearing in the degree which were not covered by the previous degrees in Engineering, or verify that the professional has acquired in the course of their professional life.

Therefore, the proposed system is a competences assessment system which ensures the acquisition of defined competences in this adaptation course.

The final grade corresponds to the assessed score (A: 60% B: 20% C: 20%) of the different aspects and activities which are part of this ASSESSMENT SYSTEM:

A. Multiple choice tests with a valid response. With at least four partial tests for each subject.

B. Works, projects and technical reports.

C. Attendance to on-site classes.

The evidence of item A will be defined by the Professor in charge of the teaching of each subject and referred to the Academic Dean to be included in the on-line campus platform so they can be performed by students of the course and they achieve the grades automatically.
The final ASSESSMENT SYSTEMs of this subject are expressed numerically, according to the provisions of art. 5 of Royal Decree 1125/2003, of September 5 (BOE September 18), whereby the European Credit System and Grading System in university degrees which are official and its validity throughout the national territory is established.

5.2.5 Brief description of contents

The contents listed here are taken from the contents for each of the corresponding subjects of the Memory of the Technical Inspection Certificate in Industrial Electronic Engineering from the University of Malaga.

FLUID MECHANICS
It is presented as an introduction to fluid mechanics for engineers and it has six parts: an introduction to fluid mechanics general concepts, the second part is about conservation laws governing the movement of fluids, along with general consideration and applications, a third one about dimensional analysis and its application to fluid mechanics, and finally, fourth and fifth part about some specific applications. These applications will be focused on engineering and environmental problems.

MATERIALS SCIENCE
This subject is considered as introduction of Materials Engineering and performs an analysis of the structure, composition, properties and performance of materials applied to different fields of engineering. It is divided into two principal parts: Firstly, the structure and performance are analyzed and then the principal materials: metallic, ceramic, polymeric and composite.

STRENGTH OF MATERIALS
Contents of this subject must supply the student with the necessary knowledge to design adequately machines and structure resistant elements.
The first part explains the Theory of Elasticity, presenting tension and deformation states, their relation and the stress a solid can undergo. Afterwards, the study of solids under different stresses is analyzed: longitudinal stress, shear stress, bending stress and torsion. This study will be completed with elastic potential, energy methods, prismatic bar instability and buckling.

MANUFACTURING ENGINEERING
It is presented as an introduction to production and manufacturing systems. Fundamentals and technological aspects of the manufacturing processes are studied, considering the environmental implications. In the second part, sustainable manufacturing and different production systems are studied, considering the automation of manufacturing systems and methods of organization of production. Finally, the concepts of quality manufacturing engineering are introduced.

ANALYSIS OF ELECTRICAL NETWORKS
It is a continuation and an advanced course of electrical circuits' analysis, which analyses unbalanced three-phase systems, their resonance and transient circuit analysis.
Furthermore, an analysis of circuits based on two-port network and non-linear electrical circuits is presented.

INDUSTRIAL AUTOMATION
Industrial automation is presented by describing the engineering of the control logic and the traditional languages to describing industrial automatisms. IEC 61131-3 is taken as reference to introduce industrial automation systems and methods to analyse, design and implement industrial automatisms. The second is an introduction to industrial robots, studying their morphology and modelling as well as the basics of robots programming to apply to the implementation of robotic cells.

5.2.6 Module Contents

1.	Fluid Mechanics. General characteristics of fluids. Kinematic description of fluid movement. Dimensional analysis and likeness concepts. Movements at low Reynolds numbers and its application to flow in ducts. Movements at high Reynolds numbers: ideal flows. Laminar and turbulent motions.	6
2.	Materials Science. Introduction, Material structure. Material features. Metallic material study, Ceramic material study. Polymeric material study. Composite material study	6
3.	Strength of Materials. Introduction to elasticity and strength of materials. The elastic solid. Failure criteria. Strength of materials. Basic concepts. Tensile and compressive stresses. Elastic simple bending. Introduction to plastic calculation. Compressive and bending stress. Torsion of circular sections. Elastic potential in bars. Energy methods. Prismatic bar instability. Buckling.	6
4.	Manufacturing Engineering. Introduction to Production and Manufacturing Systems. Fundamentals of manufacturing processes. Technological aspects of the manufacturing process Environmental implications in manufacturing. Sustainable Production Manufacturing Systems. Automated manufacturing systems. Manufacturing management. Quality Manufacturing Engineering.	6
5.	Analysis of Electrical Networks. Unbalanced three-phase systems. Resonance. Transient. Two-port networks. Non-linear electrical circuits' analysis.	6
6.	Industrial Automation. Industrial Automatisms. Engineering of the control logic. Traditional languages to describe industrial automatisms. IEC 61131-3. Industrial automation systems. Methods to analyse design and implement industrial automatisms. Morphology and modelling. Basics of robots programming. Implementation of robotic cells. Use cases.	6
	Total credits	36

ACADEMIC

6.1. Teaching staff and other necessary and available human resources to accomplish the proposed curriculum. Including information about your adequacy.

Name and surname Firstly faculty of the UMA and then another teacher, arranged alphabetically by surname and name)	NIF	Department / Company of origin	Category	Credits for each Professor	Module / subject / subject per credits	In-campus classes hours
LÓPEZ TABOADA, CARLOS	34990022-F	Civil, Materials and Manufacturing Engineering	ASSOCIATED PROFESSOR	1.5	Updated competences/ Strength of Materials	7.5
MARTÍN GRACIANI, Mª OLVIDO	24850011-Y	Civil, Materials and Manufacturing Engineering	LECTURER	6	Updated competences/Materials Science	30

MARTÍN MORENO, FRANCISCO I.	74789006-K	Electrical Engineering	PROFESSOR	1.5	Updated competences/Analysis of Electrical Networks	7.5
MARTOS RAMOS, FRANCISCO	33388897-G	Thermal Engines and Machines	LECTURER	6	Updated competences/Fluid Mechanics	30
MERINO MOYANO, EMILIO	33362838-G	Electrical Engineering	ASSOCIATED PROFESSOR	1.5	Updated competences/ Analysis of Electrical Networks	7.5
PEINADO BURGOS, BEATRIZ	26033679-W	Civil, Materials and Manufacturing Engineering	ASSOCIATED PROFESSOR	3	Updated competences/ Manufacturing Engineering	15
PEDRAZA RODRÍGUEZ, CONSOL.	75540725-P	Civil, Materials and Manufacturing Engineering	LECTURER	1.5	Updated competences/ Strength of Materials	7.5
RUÍZ GONZÁLEZ, JOSÉ ERNESTO	25674863-D	Electrical Engineering	LECTURER	1.5	Updated competences/ Analysis of Electrical Networks	7.5
SÁNCHEZ BERROCAL, JUAN	25591601-F	Civil, Materials and Manufacturing Engineering	ASSOCIATED PROFESSOR	1.5	Updated competences/ Strength of Materials	7.5
TORRES LÓPEZ, VÍCTOR	25108427-V	Systems and Automatic Engineering	LECTURER	6	Updated competences/ Industrial Automation	30
TRIVIÑO CABRERA, ALICIA	77452616-R	Electrical Engineering	ASSISTANT, DOCTOR	1.5	Updated competences/ Analysis of Electrical Networks	7.5
TRUJILLO VILCHEZ, FCO.	53686034-D	Civil, Materials and Manufacturing Engineering	ASSOCIATED PROFESSOR	3	Updated competences/ Manufacturing Engineering	15
VEINTIMILLA ALCAS, JORGE.	77322372-Y	Civil, Materials and Manufacturing Engineering	LECTURER	1.5	Updated competences/ Strength of Materials	7.5

6.2. Evaluating the competence of Professors

All participating members of the teaching staff belonging to the Knowledge Areas which are associated / affiliated Grade subjects and, therefore, faculty participants have sufficient required experience for the teaching of subjects in the course of adaptation, if included in the Human resources Verified Memory of the Degree of Industrial Electronic Engineering.

6.3. Human Resources: administrative or technical support

Administrative management:

Name and surname: NIEVES SERRANO MARTÍN **Department or contact location**: School Secretary **Phone number:** 951 952 478 **E-mail:** mnserrano@uma.es
Name and surname: Mª VICENTA BLANEZ RUIZ **Department or contact location:** School Secretary **Phone number:** 951 952 479 **E-mail:** mvblanes@uma.es
Name and surname: ANA LÓPEZ GARCÍA **Department or contact location**: School Secretary **Phone number:** 951 952 480 **E-mail**: anastasi@uma.es
Name and surname: Mª CARMEN SALAS ARENAS **Department or contact location:** School Secretary **Phone number:** 951 952 482 **E-mail**: mcsalas@uma.es
Name and surname: MARGARITA MERELO SANCHEZ **Department or contact location**: School Secretary **Phone number**: 951 952 478 **E-mail**: mms@uma.es
Name and surname: INMACULADA MUÑOZ RUIZ **Department or contact location**: School Secretary **Phone number**: 951 952 310 **E-mail**: inmamruiz@uma.es

Justification of the capacity of the material resources and available services

Material resources and available services are the same as specified in the Grade.

Physical space: Higher Polytechnic School

ON-LINE Campus: campusvirtual.uma.es

7.2 Forecast acquisition of material resources and services.

The acquisition of material resources and services is not expected, because it has the resources available.

8.1. Estimated quantitative values for the indicators and their justification

REQUIRED INDICATORS	Estimated Value
Degree Graduation Rate:	80%
Degree Dropout Rate:	20%

8.2. Introduction of new indicators (if applicable)

DESIGNATION	Definition	Estimated Rate
Degree Efficiency Rate:	(Total number of credits earned by students in the course 100%, x / total credits which are needed to enrol) * 100. This indicator aims to analyse how much it costs the students to overcome the credits of the curriculum. x: Previous course where the indicator measurement is performed.	100%

8.3. Justification of the estimates.

To estimate the indicators the values used in the application for verification of the Degree of Bachelor in Mechanical Engineering at the University of Malaga, validated by ANECA were considered, but taking into account more positive and high values on the basis that it is a course specifically aimed at graduates in Engineering with proven preparation and ability.

9. QUALITY ASSURANCE SYSTEM OF THE DEGREE

The Quality Assurance System of the Adaptation University Degree in Electronic Engineering will be adjusted with the model which is annexed. This was approved at a meeting of the Governing Council of the University of Malaga, celebrated on April 18, 2013

9.1 Person in charge of system quality assurance Syllabus.

The Quality Assurance Committee is formed by the Academic Dean and Vice-Dean, at least two Professors participating in the Degree, a student representing the group and a representative belonging to the administration.

9.2 Procedures to evaluate and improve the quality of teachings and professors.

The objective of this procedure is to know and analyse the results of the Degree.

Recollection of data.

The Committee of Quality Assurance of the Degree will analyse the results of the following indicators at the end of each academic year:

- Success rate: percentage of students on the total who have successfully completed their studies.

- Failure rate: percentage of students who have dropped out.

The Commission will be supported by Quality Service, Strategic Planning and Social Responsibility which will be responsible for their valuation as long as the data is in the database of the University of Malaga.

In addition to these indicators, the Commission of Quality Assurance of the Degree should specify whatever it is considered as relevant.

Information Analysis and Improvement of the System

The Committee of Quality Assurance will be responsible for analysing the results of the indicators, and The Committee must thoroughly examine if the estimated quantitative rates for them are satisfied or not.

These results are taken into account to prepare the Annual Report of the Results of the Degree and to prepare the Improvement Plan.

9.3 Procedure to ensure the quality of internships and mobility programs.

Not applicable

9.4 Procedures to analyse labour insertion of graduates and satisfaction with their training.

The objective of this procedure is to establish the system for measuring and analysing the results on labour insertion.

Recollecting Data.

Quality Service, Strategic Planning and Social Responsibility will support the *Section of the Degrees* and Commissions of Quality Assurance of the Degrees to develop an annual questionnaire for people who have completed the Degrees (graduates) in order to know the satisfaction of graduates with their studies and their employment status.

Information Analysis and Improvement of the System

The Committee of Quality Assurance of the Degree shall analyse the results of the Questionnaire of Degree and the result of the following indicators:

- Employability of the degree: percentage of students who start to work within two years after completing their degree.

- Average time of employability of the degree: average time it takes for graduates to start working.

These results are taken into account for preparing the Annual Report on the Results of the Degree. In the event of any improvements, these will be joined to the Improvement Plan.

9.5 Procedure to analyse the satisfaction of the groups involved (students, academic staff and administration and services, etc.) and to receive suggestions and complaints. Specific criteria in case of expiration of the degree.

PROCEDURE FOR THE ANALYSIS OF THE SATISFACTION OF GROUPS INVOLVED IN THE DEGREE

Satisfaction surveys will be used to recollect information about students, faculty and graduates. These surveys include items about the organization and development of the Degree.

Meetings will be necessary to test the satisfaction for the Personnel of Administration and Services, linked to administrative management of the program.

If there are a very high number of PAS, a questionnaire will be required.

Quality Service, Strategic Planning and Social Responsibility will prepare the model questionnaires, as directed by the Degree Section.

Once the data are submitted from different groups involved by the Commission on Quality Assurance Degree, the Degree Sections will send the data necessary for the completion of the questionnaires (emails) to Service, Strategic Planning and Social Responsibility Service is responsible for managing the questionnaires through Lime Survey manager surveys and to send the results to the Degree Sections which will forward them to the Commission to be analysed.

Information Analysis and Improvement of the System

The Committee of Quality Assurance will be responsible for analysing the information of the results of satisfaction of the groups involved in the Degree.

These results are taken into account to prepare the Annual Report of the Results of the Degree and to prepare the Improvement Plan.

The Improvement Plan includes the improvement actions which the Commission on Quality Assurance establishes once all the results of the system are measured, including derivatives valuating satisfaction groups (results of questionnaires, etc.)

PROCEDURE TO MANAGE SUGGESTIONS AND COMPLAINTS

To receive any suggestion, the procedure is established at the University of Malaga, on the general procedure for complaints, suggestions and compliments, approved by the Governing Council of 21 July 2011.

The process includes the tasks to be performed at the opening, processing and closing of Complaints, Suggestions and Congratulations as well as control and monitoring.

From the Quality Service, Strategic Planning and Social Responsibility, the Regulation will be presented to the Commission on Quality Assurance of the Degree and the members of the Commission (or responsible) will be trained in the computing tool which manages complaints, suggestions and compliments.

The Degree must include on its website a link of the System of Complaints, Suggestions and Congratulations from the University of Malaga: **http://dj.uma.es/quejasysugerencias/**

Furthermore, the Degree must possess the printed paper "Form of complaints, suggestions and compliments" for possible complaints, suggestions or compliments in paper.

In relation to any submitted complaint, it will be sent to the Commission of Quality Assurance of the Degree by different means: email, letter, etc.
Information Analysis and Improvement of the System

The Committee of Quality Assurance is responsible for analysing and processing any complaints, suggestions and compliments related to the Degree. Annually the Quality Service, Strategic Planning and Social Responsibility will send a report of the complaints, suggestions and compliments regarding the Degree, including the suggestions and compliments received, recollected and also processed. This report together with the complaints will be taken into account to prepare the Annual Report of the Results of Degree as well as to prepare the Improvement Plan.

5. TEACHING PLANNING

5.1 DESCRIPTION OF THE SYLLABUS		
See annexes. Paragraph 5		
5.2 LEARNING ACTIVITIES		
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)		
E- LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)		
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)		
5.3 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
On-site class: ACTIVITIES OUTSIDE THE UNIVERSITY (CLINICAL PRACTICES, IN INSTITUTIONS, IN COMPANIES, FIELDWORKS, VISITS TO CENTRES/INSTITUTIONS…).		
On-site class: SEMINARS/WORKSHOPS, REVIEW, DISCUSSION.		
E-Learning: EXPOSITIVE ACTIVITIES (MASTERCLASSES, CONFERENCES AND ON-LINE PRESENTATIONS).		
E-Learning: PRACTICAL ACTIVITIES (PROBLEMS, PROJECTS, DESIGNS AND CASE STUDIES.		
E- Learning: DOCUMENTATION ACTIVITIES (BIBLIOGRAPHIC/DOCUMENTARY SEARCH, TEXT COMMENTARY, REALIZATION OF GLOSSARIES, PREPARATION OF DATABASES…)		
E-Learning: DOCUMENTS (REPORTS, MEMORIES, ESSAYS, DOSSIER, DIARIES, PORTFOLIOS...).		
E-Learning: DISCUSSION ACTIVITIES (PARTICIPATION IN FORUMS, WIKIS, CHATS, ON-LINE SEMINARS…).		
E-Learning: SELF-STUDY AND INDEPENDENT WORK.		
On-site class: TUTORING.		
On-site class: ASSESSMENT ACTIVITIES (DEFENSE OF THE END OF DEGREE PROJECT)		
On-site class: ASSESSMENT		
5.4 ASSESSMENT SYSTEMS		
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OUT OF GRADES): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.		
FINAL EXAM (BETWEEN 20% AND 80% OUT OF GRADES): In-class test: two hours minimum – four hours maximum.		
DEFENSE OF THE FINAL DEGREE PROJECT IN FRONT OF AN EXAMINING BOARD.		
5.5 LEVEL 1: CORE LEARNING		
5.5.1 Core Information Level 1		
LEVEL 2: MATHEMATICS		
5.5.1.1 Core Information Level 2		
TYPE	**BRANCH**	**SUBJECT**
CORE	Engineering and Architecture	Mathematics
ECTS LEVEL2	24	
DURATION: Semester		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
12	12	
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**

OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: LINEAR ALGEBRA		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
CORE	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
6		
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: CALCULUS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
CORE	6	SEMESTER
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
6		
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: VECTOR AND STATISTICAL ANALYSIS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
CORE	6	SEMESTER
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
	6	

ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

LEVEL 3: ADVANCED CALCULUS

5.5.1.1.1 Core Information Level 3

TYPE	ECTS SUBJECT	DURATION
CORE	6	SEMESTER

DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
	6	
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Linear Algebra
Matrices and determinants.
Linear systems of equations.
Vector spaces.
Numerical linear algebra.
Calculation of eigenvalues and eigenvectors.
Affine and Euclidean space. Related applications.
Exponential matrices.

Calculus.

Real and complex numbers.
Real functions of real variables.
Geometric and physical applications.
Real function integration of real variables.
Numerical series and series of functions.
Real function integration of real variables.
Interpolation and approximation of functions.
Vector fields and scalar fields.
Maxima and minima.

Vector and Statistical Analysis

Differential geometry.
Line integral. Double and triple integrals. Surface integrals.
Dimensional and two-dimensional descriptive statistics.
Introduction to Discrete Mathematics.

Advanced calculus

First order differential equations (ODE).
Superior order ODE.
Laplace Transform.
Numerical solution of differential equations and systems of differential equations.
Methods of complex variables.
Partial Differential Equations.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB3 – Ability to gather and interpret relevant data (usually within their field of study) to make judgments which include reflection on relevant social, scientific or ethical aspects.

CB4 – Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.

CB5 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

B1 – Ability to solve mathematical problems that may arise in engineering. Ability to apply knowledge of linear algebra; geometry; differential and integral calculus; differential and partial derivatives equations; numerical methods; numerical algorithms; statistics and optimization.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS

On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)

Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)

Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)

E- Learning: PERSONAL STUDY

On-site class: ASSESSMENT

5.5.1.8 ASSESSMENT SYSTEMS

ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0

LEVEL 2: PHYSICS

5.5.1.1 Core Information Level 2		
TYPE	**BRANCH**	**SUBJECT**
CORE	Engineering and Architecture	Physics
ECTS LEVEL2	12	
DURATION: Semester		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
6	6	
ECTS Semester	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: PHYSICS 1		
5.5.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
CORE	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
6		
ECTS Semester	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: PHYSICS 2		
5.5.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
CORE	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
	6	
ECTS Semester	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		

SPANISH	CATALAN	BASQUE
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Physics 1

Classical mechanics.

Mechanics of particle systems.

Elasticity and fluids.

Oscillations and waves.

Thermodynamics.

Physics 2

Electric field.

Magnetic field.

Time-dependent fields.

Electromagnetic waves.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB3 – Ability to gather and interpret relevant data (usually within their field of study) to make judgments which include reflection on relevant social, scientific or ethical aspects.

CB4 – Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.

CB5 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

B2 – Understanding and mastering the basic concepts of the general laws of mechanics, thermodynamics, electromagnetism and their application to solving engineering problems.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS

On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)

Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: GRAPHIC EXPRESSION		
5.5.1.1 Core Information Level 2		
TYPE	**BRANCH**	**SUBJECT**
CORE	Engineering and Architecture	Graphic Expression
ECTS LEVEL2	6	
DURATION: Semester		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
	6	
ECTS Semester	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	**NO**
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: GRAPHIC EXPRESSION IN ENGINEERING		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
CORE	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
6		
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		

SPANISH	CATALAN	BASQUE
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Metric Geometry.

Principles of Standardization.

Diedric (Basics and Distances).

Diedric (Angles).

Diedric (Flat sections).

Diedric (Surfaces intersection).

Axonometric perspective.

Cavalier perspective.

Contour maps.

Introduction to CAD.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

A6 – Ability to handle specifications, regulations and mandatory rules.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

B5 – Ability for spatial vision and knowledge of graphic representation techniques, both traditional methods of metric and descriptive geometry, and geometry through applications of computer-aided design.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS

On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)

Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)

Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)

E- Learning: PERSONAL STUDY AND INDEPENDENT WORK

On-site class: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: BUSINESS		
5.5.1.1 Core Information Level 2		
TYPE	**BRANCH**	**SUBJECT**
CORE	Engineering and Architecture	Business
ECTS LEVEL2	6	
DURATION: Semester		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
6		
ECTS Semester	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: BUSINESS MANAGEMENT		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
CORE	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
6		
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
5.5.1.2 LEARNING RESULTS		

5.5.1.3 CONTENTS

The firm.

Science, technology and industry systems.

Competitiveness and innovation of the company.

Social responsibility.

Company strategy and policy.

Business creation.

Techniques of direction and management.

Financial management of the company.

Commercial management systems.

Production management systems.

Human resources in the company.

Management of business risks.

Quality management.

Environmental management in the company.

Project management.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB3 – Ability to gather and interpret relevant data (usually within their field of study) to make judgments including consideration on relevant social scientific or ethical aspects.

CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.

CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

A5 – Knowledge to perform measurements, calculations, assessments, appraisals, expert calculations, studies, reports, work plans and similar work.

A6 – Ability to handle specifications, regulations and mandatory rules.

A7 – Ability to analyse and evaluate the social and environmental impact of technical solutions.

A8 – Ability to apply principles and methods of quality.

A9 – Ability to organise and schedule in the field of business and other institutions and organizations.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

B6 – Adequate knowledge of the business concept, institutional and legal framework of the company. Organization and management companies.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100

CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: CHEMISTRY		
5.5.1.1 Core Information Level 2		
TYPE	**BRANCH**	**SUBJECT**
CORE	Engineering and Architecture	Chemistry
ECTS LEVEL 2	6	
DURATION: Semester		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
6		
ECTS Semester	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: CHEMISTRY		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
CORE	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
6		
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**

OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Structure of matter and nuclear chemistry.

Chemical transformations and chemical balance.

Chemistry of pollution.

Electrical-chemistry.

Instrumental analysis.

Basics of Industrial Chemistry.

Applications of organic and inorganic chemistry to engineering.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB3 – Ability to gather and interpret relevant data (usually within their field of study) to make judgments including consideration on relevant social scientific or ethical aspects.

CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.

CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.

7 – Ability to analyse and evaluate the social and environmental impact of technical solutions.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

B4 – Ability to understand and apply the principles of basic knowledge of general chemistry, organic and inorganic chemistry and applications in engineering.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS

On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)

Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)

Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)

E- Learning: PERSONAL STUDY AND INDEPENDENT WORK

On-site class: EVALUATION		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: COMPUTING		
5.5.1.1 Core Information Level 2		
TYPE	**BRANCH**	**SUBJECT**
CORE	Engineering and Architecture	Computing
ECTS LEVEL2	6	
DURATION: Semester		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
	6	
ECTS Semester	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: BASICS OF COMPUTING		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
CORE	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
	6	
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
5.5.1.2 LEARNING RESULTS		

5.5.1.3 CONTENTS

Computer and information.

Computer structure.

Basic concepts of Operative Systems.

Database basic concepts.

Algorithms and programs.

Introduction to Programming in C language.

Control structures.

Functions.

Structure data.

Communication systems: Telematics and Internet.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

B3 – Basic knowledge of the use and programming of computers, operating systems, databases and computing programs with applications in engineering.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS

On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)

Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)

Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)

E- Learning: PERSONAL STUDY AND INDEPENDENT WORK

On-site class: EVALUATION

5.5.1.8 ASSESSMENT SYSTEMS

ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0

FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0

5.5 LEVEL 1: COMMON LEARNING TO INDUSTRIAL BRANCH.		
5.5.1 Core Data of Level 1		
LEVEL 2: SCIENCE AND ENGINEERING OF MATERIALS		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
6		
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: SCIENCE OF MATERIALS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
6		
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Introduction. The structure of materials. Behaviour of materials. Study of metal materials. Study of ceramics.		

Study of polymeric materials. Study of composite materials.
5.5.1.4 OBSERVATIONS
5.5.1.5 COMPETENCES
5.5.1.5.1 CORE AND GENERAL COMPETENCES
CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.
CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.
CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.
CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.
A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.
A5 – Knowledge to perform measurements, calculations, assessments, appraisals, expert calculations, studies, reports, work plans and similar work.
A6 – Ability to handle specifications, regulations and mandatory rules.
A7 – Ability to analyse and evaluate the social and environmental impact of technical solutions.
5.5.1.5.2 CROSS-CURRICULUM
No data exist
5.5.1.5.3 SPECIFIC
C3 – Knowledge of the fundamentals of science, technology and chemistry of materials. To understand the relationship among microstructures, synthesis or processing and properties of materials.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK
On-site class: ASSESSMENT

5.5.1.8 ASSESSMENT SYSTEMS

ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT

CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0

LEVEL 2: MANUFACTURING ENGINEERING		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION: Semester		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
		6
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: MANUFACTURING ENGINEERING		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
		6
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Introduction to production systems and manufacturing. Fundamentals of manufacturing processes. Technological aspects of the manufacturing process.		

Environmental implications in manufacturing.
Sustainable manufacturing.
Production systems.
Automated manufacturing systems.
Organization of production.
Manufacturing quality engineering.
Foundry operations.
Operations in a plastic deformation workshop
Operations in a welding workshop I.
Operations in a welding workshop II.
Operations in a machining workshop I.
Operations in a machining workshop II.
5.5.1.4 OBSERVATIONS
5.5.1.5 COMPETENCES
5.5.1.5.1 CORE AND GENERAL COMPETENCES
CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.
CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.
CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.
CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.
A1 – Ability to write, sign and develop projects in the field of industrial engineering which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energy facilities, electrical and electronic installations, installations and industrial plants and manufacturing-automation processes.
A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.
A5 – Knowledge to perform measurements, calculations, assessments, appraisals, expert calculations, studies, reports, work plans and similar work.
A6 – Ability to handle specifications, regulations and mandatory rules.
A7 – Ability to analyse and evaluate the social and environmental impact of technical solutions.
A8 – Ability to apply principles and methods of quality.
A10 – Ability to work in a multilingual and multidisciplinary environment.
5.5.1.5.2 CROSS-CURRICULUM
No data exist
5.5.1.5.3 SPECIFIC
C9 – Basic knowledge of production and manufacturing systems.
C10 – Basic knowledge and application of environmental technologies and sustainability.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100

CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS

On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)

Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)

Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)

E- Learning: PERSONAL STUDY AND INDEPENDENT WORK

On-site class: ASSESSMENT

5.5.1.8 ASSESSMENT SYSTEMS

ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0

5.5 LEVEL 1: COMMON LEARNING TO INDUSTRIAL BRANCH II

5.5.1 Core Data of Level 1

LEVEL 2: THERMOTECNICS

5.5.1.1 Core Information Level 2

TYPE	COMPULSORY
ECTS LEVEL 2	6

DURATION

ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
		6
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**

OFFERED IN THE FOLLOWING LANGUAGES

SPANISH	CATALAN	BASQUE
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

LEVEL 3: THERMOTECNICS

5.5.1.1.1 Core Information Level 3

TYPE	ECTS SUBJECT	DURATION
COMPULSORY	6	Semester

DURATION

ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
		6
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Exergy analysis of thermodynamic systems. Exergy concept.

Steam power cycles.

Power generation with gas cycles.

Refrigerators and heat pump cycles.

Nonreactive ideal gas mixtures and psychrometrics.

Reactive mixtures and combustion.

General concepts of heat transfer.

Thermal conduction.

Convective heat transfer.

Radiation heat-transfer.

Applications in facilities.

Practice 1. Stirling engine.

Practice 2. Steam turbine cycles.

Practice 3. Cycle gas turbine.

Practice 4. Alternative motor cycles.

Practice 5. Study of steam-compression refrigeration cycle.

Practice 6. Solid thermal conductivity.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

C1 – Knowledge of applied thermodynamics and heat transfer. Basic principles and their applications to solving engineering problems.

C10 – Basic knowledge and application of environmental technologies and sustainability.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK
On-site class: ASSESSMENT

5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0

LEVEL 2: FLUID MECHANICS		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
6		
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

LEVEL 3: FLUID MECHANICS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester

DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
6		
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**

OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

General characteristics of fluids.

Kinematic description of fluid motion.

Dimensional analysis concepts and physical resemblance.

Movements at low Reynolds numbers and their application to flow in ducts.

Movements at high Reynolds numbers.

Laminar and turbulent motions.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

A7 – Ability to analyse and evaluate the social and environmental impact of technical solutions.

A10 – Ability to work in a multilingual and multidisciplinary environment.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

C2 – Knowledge of the basic principles of fluid mechanics and their application to solving problems in the field of engineering. Pipes, channels and fluid systems calculations.

C10 – Basic knowledge and application of environmental technologies and sustainability.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100

CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK
On-site class: ASSESSMENT

5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0

5.5 LEVEL 1: COMMON LEARNING TO INDUSTRIAL BRANCH III		
5.5.1 Core Data of Level 1		
LEVEL 2: CONTROL ENGINEERING		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
6		
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: CONTROL ENGINEERING		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester
DURATION		

ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
6		
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Introduction.

Concept and types of systems. Concept and types of automation.

PC control.

Engineering Control Logic.

Industrial Automation.

Programmable Logic Controllers.

Automatic control.

Linear systems. Laplace transforms and z-transforms.

Sampled systems. Transfer functions. Description in state space.

Transient response systems first and second order. The concept of closed-loop.

Introduction to Control Systems. Examples of Control Systems.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

CB3 – Ability to gather and interpret relevant data (usually within their field of study) to make judgments including consideration on relevant social scientific or ethical aspects.

CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

A10 – Ability to work in a multilingual and multidisciplinary environment.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

C6 – Knowledge of the basics of automation and control methods.

5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	**HOURS**	**PRESENTIALITY**
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK
On-site class: ASSESSMENT

5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0

LEVEL 2: ELECTROTECHNICS		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION: Semester		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
6		
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

LEVEL 3: FUNDAMENTALS OF ELECTRICAL ENGINEERING		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester

DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
6		
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**

OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Introduction to analysis of circuits.

Technical analysis of circuits.

Theorems and additional analytical techniques.

Stationary sinusoid regime.

Three-phase electric power.

Elements in power systems.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

CB3 – Ability to gather and interpret relevant data (usually within their field of study) to make judgments including consideration on relevant social scientific or ethical aspects.

CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

C4 – Knowledge and use of the principles of circuit theory and electrical machines.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS

On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)

Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: ELECTRONICS		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION: Semester		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
6		
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: FUNDAMENTALS OF ELECTRONICS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
6		
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**

YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Basics of linear circuits. Amplification.

Diodes. Diode circuits.

Bipolar (BJT). Circuits with transistors. Differential stages.

Operational amplifiers. O.A. circuits.

Basics of digital logic. Definition of states.

Logic functions. Boolean algebra.

Logic Devices. Logic gates. Combinational logic.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

CB3 – Ability to gather and interpret relevant data (usually within their field of study) to make judgments including consideration on relevant social scientific or ethical aspects.

CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

C5 – Knowledge of the basics of electronics.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS

On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)

Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)

Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)

E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
5.5 LEVEL 1: COMMON LEARNING TO INDUSTRIAL BRANCH IV		
5.5.1 Core Data of Level 1		
LEVEL 2: STRENGTH OF MATERIALS		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
		6
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: STRENGTH OF MATERIALS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
		6
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**

NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Introduction to elasticity and strength of materials.

Elastic solid.

Plasticizing and breaking criteria.

Strength of materials. Basics.

Traction and compression.

Flat elastic flexion.

Introduction to plastic calculation.

Deflected flexo-compression.

Twist in circular profiles.

Elastic potential bar. Energy methods.

Instability of prismatic bars. Buckling.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.

CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

A6 – Ability to handle specifications, regulations and mandatory rules.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

C8 – Knowledge and use of the principles of strength of materials.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS

On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)

Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK
On-site class: ASSESSMENT

5.5.1.8 ASSESSMENT SYSTEMS

ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0

LEVEL 2: MACHINES AND MECHANISMS

5.5.1.1 Core Information Level 2

TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
		6
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

LEVEL 3: THEORY OF MACHINES

5.5.1.1.1 Core Information Level 3

TYPE	ECTS SUBJECT	DURATION
COMPULSORY	6	Semester

DURATION

ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
		6
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**

YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Introduction to the study of mechanisms.

Kinematic analysis of flat mechanisms.

Dynamic analysis of mechanisms.

Balancing.

Flywheels.

Vibrations.

Gears.

Transmissions and gear trains.

Practice 1: mechanisms analysis software (MECC).

Practice 2: couple on a rod-crank mechanism calculation chart.

Practice 3: rotor balancing.

Practice 4: transmission of four gears.

Practice 5: simple planetary gear train.

Practice 6: double planetary gear train.

Practice 7: automatic transmission with three gears.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.

CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

A7 – Ability to analyse and evaluate the social and environmental impact of technical solutions.

A10 – Ability to work in a multilingual and multidisciplinary environment.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

C7 – Knowledge of the principles of machines and mechanisms theory.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY

CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK
On-site class: ASSESSMENT

5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0

5.5 LEVEL 1: COMMON LEARNING TO INDUSTRIAL BRANCH V		
5.5.1 Core Data of Level 1		
LEVEL 2: PROYECTS		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
6		
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: TECHNICAL OFFICE		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**

COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
6		
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
The work of engineering: the industrial technician. The technical office and its organization. Computer applications to T.O Reviews, valuations, technical reports and certificates. Industrial projects. Definition and purpose; phases, formal presentation and structure. Processing. Project documents: general index. Memory and annexes. Project documents: planes. Project documents: contract specifications. Project documents: state of measurements. Project documents: budget. Project documents: ad hoc studies. Construction management. Regulations for industrial facilities and their applications.		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.		
CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.		
CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.		
CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.		
5.5.1.5.2 CROSS-CURRICULUM		
No data exist		
5.5.1.5.3 SPECIFIC		
C10 – Basic knowledge and application of environmental technologies and sustainability.		
C11 – Applied knowledge of business management.		

C12 – Knowledge and skills to organise and manage projects. Knowledge of the organizational structure and functions of a project office.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	**HOURS**	**PRESENTIALITY**
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: GRAPHIC EXPRESSION		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
		6
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: GRAPHIC ENGINEERING IN ELECTRONICS		
5.5.1.1.1 Core Information Level 3		

TYPE	ECTS SUBJECT	DURATION
COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
		6
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Cuts and sections

Dimensioning and drawing sets

Dimensional and geometric tolerances

Surface states

Standard elements of detachable joints. Metal structures

Fixed joints

Springs

Electrical standardization. General rules of representation of electrical symbols

Electrical installations in residential buildings

Electrical installations in industrial buildings

Representation systems in electrotechnics

Representation systems in analogue electronics

Systems in digital electronic representation

CAD for electronics

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

A1 – Ability to write, sign and develop projects in the field of industrial engineering which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energy facilities, electrical and electronic installations, installations and industrial plants and manufacturing-automation processes.

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

A5 – Knowledge to perform measurements, calculations, assessments, appraisals, expert calculations, studies, reports, work plans and similar work.

A6 – Ability to handle specifications, regulations and mandatory rules.

5.5.1.5.2 CROSS-CURRICULUM		
No data exist		
5.5.1.5.3 SPECIFIC		
B5 – Ability for spatial vision and knowledge of graphic representation techniques, both traditional methods of metric and descriptive geometry, and geometry through applications of computer-aided design.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	**HOURS**	**PRESENTIALITY**
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
5.5 LEVEL 1: SPECIFIC LEARNING IN ELECTRONICS ENGINEERING I		
5.5.1 Core Data Level 1		
LEVEL 2: ANALOGUE ELECTRONICS		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
	6	
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO

FRENCH	GERMAN	PORTUGUESE
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: ANALOGUE ELECTRONICS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
	6	
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Basics of semiconductors. Introduction to the semiconductor physics. The P-N junction. Bipolar junction transistor (BJT). The junction gate field-effect transistor (JFET). The insulated-gate field-effect transistor (MOSFET). Application of semiconductor devices to gain basic stages. Polarization of discrete devices and integrated structures study. Frequency response of amplifier stages with transistors. Simulation. Laboratory practices.		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.		
CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.		
CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.		
CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.		
A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.		
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.		

A6 – Ability to handle specifications, regulations and mandatory rules.		
5.5.1.5.2 CROSS-CURRICULUM		
No data exist		
5.5.1.5.3 SPECIFIC		
E2EI – Knowledge of the basics and applications of analogue electronics.		
E6EI – Ability to design digital, analogue and power electronic systems.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	**HOURS**	**PRESENTIALITY**
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: DIGITAL ELECTRONICS		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
	6	
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**

NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: DIGITAL ELECTRONICS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
	6	
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Introduction to digital electronics. Combinational functions. Flip-flops and related items. Sequential circuits (I). Sequential circuits (II). Counters. Registers. Programmable memories and elements. Microprocessors. Peripheral devices. Annexed units to processor. Microprocessor based systems (MBS). Practice 1: hardware register with serial and parallel preload. Practice 2: digital circuits' simulation. Timing diagrams analysis. Practice 3: microcontroller programming with MPLAB/ICD2/PICDEM2+.		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.		
CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.		
CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.		

CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.
A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.
A10 – Ability to work in a multilingual and multidisciplinary environment.
5.5.1.5.2 CROSS-CURRICULUM
No data exist
5.5.1.5.3 SPECIFIC
E3EI – Knowledge of the basics and applications of digital electronics and microprocessors.
E6EI – Ability to design digital, analogue and power electronic systems.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK
On-site class: ASSESSMENT

5.5.1.8 EVALUATION SYSTEMS

ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0

LEVEL 2: ELECTRONICS

5.5.1.1 Core Information Level 2

TYPE	COMPULSORY
ECTS LEVEL 2	12

DURATION

ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
		6
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
6		

ECTS Semester 10	ECTS Semester 11	ECTS Semester 12
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: DIGITAL ELECTRONIC SYSTEMS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
		6
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: INTEGRATED CIRCUITS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
6		
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Digital electronic systems The microprocessor CU.		

The MBS as the basis of microcontrollers.

System Specifications.

Industrial microcontrollers.

Industrial Embedded Systems.

Practice 1. Making an application with industrial microcontrollers.

Practice 2. Using embedded systems for applications.

Integrated circuits

Feedback. Frequency response. Stability. Bode plots.

Basics for operational Amplifier. The ideal amplifier. The real amplifier.

Operational amplifier linear applications. Basic configurations. Simulation.

Operational amplifier nonlinear applications. Harmonic oscillators. Simulation.

Output power stages.

Voltage regulators and power supplies.

IC thermal performance. Heat dissipation.

Process of design configurations.

Laboratory Practices: A set of common configurations.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.

CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

A10 – Ability to work in a multilingual and multidisciplinary environment.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

E2EI – Knowledge of the basics and applications of analogue electronics.

E3EI – Knowledge of the basics and applications of digital electronics and microprocessors.

E6EI – Ability to design digital, analogue and power electronic systems.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0

EVALUATION	15	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
5.5 LEVEL 1: SPECIFIC LEARNING IN ELECTRONICS ENGINEERING II		
5.5.1 Core Data Level 1		
LEVEL 2: POWER ELECTRONICS		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
6		
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: POWER ELECTRONICS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**

6		
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Introduction to power electronics.

Power semiconductors.

Not controlled rectifiers.

Phase-controlled converters.

DC/DC converters.

Inverters.

AC/AC converters.

Power electronics applications.

Practice 1. Power semiconductors: diodes, thyristors and transistors. Polarization. Firing circuits.

Practice 2. Phase-controlled rectifiers and converters.

Practice 3. DC / DC converters. Controllable switch converter. PWM converter.

Practice 4. Inverters.

Practice 5. AC/AC converters.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

CB3 – Ability to gather and interpret relevant data (usually within their field of study) to make judgments including consideration on relevant social scientific or ethical aspects.

CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.

CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

A7 – Ability to analyse and evaluate the social and environmental impact of technical solutions.

A10 – Ability to work in a multilingual and multidisciplinary environment.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

E4EI – Applied knowledge of power electrotechnics.

E6EI – Ability to design digital, analogue and power electronic systems.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	**HOURS**	**PRESENTIALITY**
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: ELECTRONIC INSTRUMENTATION		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
6		
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: ELECTRONIC INSTRUMENTATION		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**

COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
6		
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Measurement systems architecture

Measurement systems implementation

PC-based instrumentation software

Practice 1: data acquisition cards

Practice 2: data acquisition modules

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

CB3 – Ability to gather and interpret relevant data (usually within their field of study) to make judgments including consideration on relevant social scientific or ethical aspects.

CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.

CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

A5 – Knowledge to perform measurements, calculations, assessments, appraisals, expert calculations, studies, reports, work plans and similar work.

A6 – Ability to handle specifications, regulations and mandatory rules.

A10 – Ability to work in a multilingual and multidisciplinary environment.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

E5EI – Applied knowledge of electronic instrumentation.

5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	**HOURS**	**PRESENTIALITY**
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK
On-site class: ASSESSMENT

5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0

LEVEL 2: ELECTRONICS		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
	6	
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

LEVEL 3: ELECTRONIC TECHNOLOGY		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester
DURATION		

ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
	6	
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**

OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Introduction to components. Processes and products engineering.

Passive components. Resistances. Capacitors. Inductive devices. Quartz crystals.

Semiconductor materials. Manufacturing technology.

Semiconductor devices. Electrical and technological parameters. Light-emitting diodes (LED). Liquid-crystal displays (LCD).

Printed circuit boards. Technology. Typology.

Thick layer technology. Hybrid circuits.

Manufacturing processes. Components assembly in printed circuit boards.

Theory of Quality and Reliability of electronic components. Testing / reliability of components.

Detection techniques and troubleshooting.

Materials management. Logistics. SW tools of CAM production management.

Practice 1: Design, simulation and installation of an electronic application. Specifications development. Development of the engineering documentation. Wiring diagram. Component lists. Assembly and testing instructions.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

CB3 – Ability to gather and interpret relevant data (usually within their field of study) to make judgments including consideration on relevant social scientific or ethical aspects.

CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.

CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.

A2 – Ability for the management of the activities of engineering projects described in the previous section.

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.

A6 – Ability to handle specifications, regulations and mandatory rules.

A7 – Ability to analyse and evaluate the social and environmental impact of technical solutions.

A8 – Ability to apply principles and methods of quality.		
A9 – Ability to organise and schedule in the field of business and other institutions and organizations.		
A10 – Ability to work in a multilingual and multidisciplinary environment.		
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.		
5.5.1.5.2 CROSS-CURRICULUM		
No data exist		
5.5.1.5.3 SPECIFIC		
E2EI – Knowledge of the basics and applications of analogue electronics.		
E6EI – Ability to design digital, analogue and power electronic systems.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	**HOURS**	**PRESENTIALITY**
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
5.5 LEVEL 1: SPECIFIC LEARNING IN ELECTRONICS ENGINEERING III		
5.5.1 Core Data Level 1		
LEVEL 2: AUTOMATIC REGULATION		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
	6	

ECTS Semester 7	ECTS Semester 8	ECTS Semester 9
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: AUTOMATIC REGULATION		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
	6	
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Dynamic Systems Modeling and Simulation. Dynamic systems analysis in continuous and discrete time. Introduction to control systems designing.		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.		
CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.		
CB3 – Ability to gather and interpret relevant data (usually within their field of study) to make judgments including consideration on relevant social scientific or ethical aspects.		
CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.		
CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.		
A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.		

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.		
A10 – Ability to work in a multilingual and multidisciplinary environment.		
5.5.1.5.2 CROSS-CURRICULUM		
No data exist		
5.5.1.5.3 SPECIFIC		
E7EI – Knowledge and ability to model and simulate systems.		
E8EI – Knowledge of automatic regulation and control techniques and their application to industrial automation.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	**HOURS**	**PRESENTIALITY**
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: AUTOMATIC CONTROL		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
		6
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO

GALICIAN	VALENCIAN	ENGLISH
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

LEVEL 3: AUTOMATIC CONTROL		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester

DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
		6
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**

OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Industrial Automation.

Control Logic Engineering.

Traditional languages for describing industrial automation.

IEC 61131-3 Standard.

Programmable logic controllers.

Methods for analysis, design and implementation of industrial automation.

Introduction to industrial robots.

Morphology and modelling.

Robot programming fundamentals.

Implementation of robotic cells. Practical cases.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.

A6 – Ability to handle specifications, regulations and mandatory rules.

A10 – Ability to work in a multilingual and multidisciplinary environment.

A11 – Knowledge, understanding and ability to apply the necessary legislation in the exercise of the profession of Engineer.		
5.5.1.5.2 CROSS-CURRICULUM		
No data exist		
5.5.1.5.3 SPECIFIC		
E9EI – Knowledge of principles and applications of robotic systems.		
E11EI – Ability to design control systems and industrial automation.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	**HOURS**	**PRESENTIALITY**
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: INDUSTRIAL COMPUTING		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
		6
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**

NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: INDUSTRIAL COMPUTING		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
		6
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Introduction to industrial computing. Microcontrollers and microprocessors for control systems. Interruptions and transfer methods. Interfaces with industrial processes. Distributed control systems. Real-time control systems. Industrial communication and fieldbuses.		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.		
CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.		
CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.		
CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.		
A1 – Ability to write, sign and develop projects in the field of industrial engineering which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energy facilities, electrical and electronic installations, installations and industrial plants and manufacturing-automation processes.		
A2 – Ability for the management of the activities of engineering projects described in the previous section.		
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.		

5.5.1.5.2 CROSS-CURRICULUM		
No data exist		
5.5.1.5.3 SPECIFIC		
E10EI – Applied knowledge of industrial computing and communications.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	**HOURS**	**PRESENTIALITY**
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: CONTROL ENGINEERING		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
	6	
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: INDUSTRIAL CONTROLLERS DESIGN		

5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
	6	
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Industrial process control instrumentation.

Experimental characterization of processes.

PID controllers design.

PID control structures.

Nonlinear elements in the control loop.

Nonlinear PID control variants.

PID controllers' auto-tuning.

Control Paradigms.

Control structures based on models.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

CB3 – Ability to gather and interpret relevant data (usually within their field of study) to make judgments including consideration on relevant social scientific or ethical aspects.

CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.

CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.

A1 – Ability to write, sign and develop projects in the field of industrial engineering which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energy facilities, electrical and electronic installations, installations and industrial plants and manufacturing-automation processes.

A2 – Ability for the management of the activities of engineering projects described in the previous section.

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.
A5 – Knowledge to perform measurements, calculations, assessments, appraisals, expert calculations, studies, reports, work plans and similar work.
5.5.1.5.2 CROSS-CURRICULUM
No data exist
5.5.1.5.3 SPECIFIC
T1EI – Ability to tune industrial controllers and experimental identification of plants.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK
On-site class: ASSESSMENT

5.5.1.8 EVALUATION SYSTEMS

ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0

5.5 LEVEL 1: SPECIFIC LEARNING IN ELECTRONICS ENGINEERING IV

5.5.1 Core Data Level 1

LEVEL 2: ELECTROTECHNICS

5.5.1.1 Core Information Level 2

TYPE	COMPULSORY
ECTS LEVEL 2	6

DURATION

ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
	6	
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**

OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LEVEL 3: ANALYSIS OF ELECTRICAL NETWORKS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
COMPULSORY	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
	6	
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Unbalanced three-phase systems. Resonance. Transient regime. Two-port networks. Analysis of nonlinear electrical circuits.		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.		
CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.		
CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.		
CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.		
A1 – Ability to write, sign and develop projects in the field of industrial engineering which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energy facilities, electrical and electronic installations, installations and industrial plants and manufacturing-automation processes.		
A2 – Ability for the management of the activities of engineering projects described in the previous section.		

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.		
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.		
A5 – Knowledge to perform measurements, calculations, assessments, appraisals, expert calculations, studies, reports, work plans and similar work.		
A6 – Ability to handle specifications, regulations and mandatory rules.		
5.5.1.5.2 CROSS-CURRICULUM		
No data exist		
5.5.1.5.3 SPECIFIC		
E7EI – Knowledge and ability to model and simulate systems.		
E8EI – Knowledge of automatic regulation and control techniques and their application to industrial automation.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	**HOURS**	**PRESENTIALITY**
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
5.5 LEVEL 1: OPTIONAL LEARNING		
5.5.1 Core Data Level 1		
LEVEL 2: ELECTRONICS		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
ECTS LEVEL 2	24	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**

ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
12	12	
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		
LEVEL 3: ADVANCED DIGITAL SYSTEMS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
6		
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		
LEVEL 3: MICROELECTRONICS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
	6	
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

LIST OF MENTIONS		
No data exist		
LEVEL 3: ELECTRONICS ENGINEERING EQUIPMENT		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
6		
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		
LEVEL 3: ELECTRONIC MEASURING		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
	6	
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Advanced digital systems Introduction to digital signal processing. Digital signal processing and digital signal processors. State of the art of digital signal processors.		

DSP TMS 320C study.

Electro-magnetic compatibility (EMC).

Digital communications.

Practice 1. To carry out different types of digital filters with DSP development equipment.

Practice 2. Simulation and EMC measures on PCSPICE.

Practice 3. Simulation of simple digital modulators: AM, OOK, FSK, PSK, and QAM using LabView.

Microelectronics

Introduction to integrated circuits and VLSI systems.

Devices and basic circuits.

Technologies, design rules and parameters estimation.

Programmable logic devices.

Field programmable gate arrays.

Logical design complements.

Hardware description languages: VHDL.

Detail and study work tools.

Electronic engineering equipment

Introduction. Electronic equipment and systems.

Design of electronic equipment.

Electronic equipment in industrial control.

Electronic equipment in biomedicine.

Electronic equipment in the car.

Additional electronic equipment.

Electronic measuring

Measurement systems implementations.

PC-based instrumentation software.

Practice 1: data acquisition cards.

Practice 2: data acquisition modules.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.

CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

A5 – Knowledge to perform measurements, calculations, assessments, appraisals, expert calculations, studies, reports, work plans and similar work.

A10 – Ability to work in a multilingual and multidisciplinary environment.		
5.5.1.5.2 CROSS-CURRICULUM		
No data exist		
5.5.1.5.3 SPECIFIC		
E3EI – Knowledge of the basics and applications of digital electronics and microprocessors.		
E6EI – Ability to design digital, analogue and power electronic systems.		
OEI1 – To understand logic gates at CMOS level and to design small systems using layout rules given by the manufacturer for ASICs FULL CUSTOM type.		
OEI2 – Ability to design ASIC systems using high-level hardware description languages (VHDL specifically).		
OEI3 – To understand the specificity of modelling languages and hardware simulation and to manage VHDL.		
OEI4 – To understand the ability and different implementable solutions in FPGA systems and systems available on the market.		
OEI5 – To understand the ability and different implementable solutions in FPGA systems and systems available on the market.		
OEI6 – Ability to manage electronic instrumentation based on PCs.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	**HOURS**	**PRESENTIALITY**
CLASSROOM LEARNING ACTIVITIES	60	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: ELECTRICITY		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
ECTS LEVEL 2	12	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
	6	
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**

6		
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		
LEVEL 3: ELECTRICAL MACHINES AND INSTALLATIONS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
6		
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		
LEVEL 3: LIGHTING AND HOME AUTOMATION TECHNIQUES		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
	6	
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		

No data exist

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Machines and electrical installations

Single-phase transformers.

Trials.

Three-phase transformers.

Constitution and principle of the induction machine operation.

Operation in charge.

Selection and installation.

Electric energy generation and distribution.

Electrical pipes.

Low voltage electrical switchgear.

Installations protection against overcurrent.

Protection against direct and indirect contacts.

Reactive power compensation.

Lighting and home automation techniques

Basic factors in lighting.

Quantities and units used in lighting.

Charts and lighting graphs.

Reflection, absorption and transmission of light.

Technological aspects of incandescent light bulb.

Gas-discharge bulbs (I).

Gas-discharge bulbs (II).

Interior lighting project.

Outdoor lighting project.

Fundamental principle of roads lighting.

Basics to consider in the calculation of public roads lighting.

Installations lighting power and control.

Home automation introduction.

What is home automation?

Home automation market characteristics.

User requirements.

Home automation system configuration.

Home automation applications.

Home automation buildings conditions.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.		
CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.		
CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.		
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.		
5.5.1.5.2 CROSS-CURRICULUM		
No data exist		
5.5.1.5.3 SPECIFIC		
C4 – Knowledge and use of the principles of circuit theory and electrical machines.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	**HOURS**	**PRESENTIALITY**
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: CONTROL ENGINEERING		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
ECTS LEVEL 2	12	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
	6	6
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		

SPANISH	CATALAN	BASQUE
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		
LEVEL 3: PERCEPTION SYSTEMS FOR AUTOMATION		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
		6
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		
LEVEL 3: INDUSTRIAL ROBOTS PROGRAMMING		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
	6	
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		
5.5.1.2 LEARNING RESULTS		

5.5.1.3 CONTENTS

Perception systems for automation

Introduction to sensory and machine vision systems. Types of magnitudes and technologies. Data acquisition techniques and transfer methods. Imaging techniques. Preprocessing.

Image segmentation.

Distance vision sensors. Position estimation. Stereo vision. Sensor networks. Pattern recognition.

Industrial robots programming

Introduction to Robotics. Morphology and characteristics.

Direct kinematic model.

Inverse kinematic model.

Robot programming languages.

Implementation of industrial robots. Robots integration. Security.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.

CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.

CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.

A1 – Ability to write, sign and develop projects in the field of industrial engineering which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energy facilities, electrical and electronic installations, installations and industrial plants and manufacturing-automation processes.

A2 – Ability for the management of the activities of engineering projects described in the previous section.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

A6 – Ability to handle specifications, regulations and mandatory rules.

A10 – Ability to work in a multilingual and multidisciplinary environment.

A11 – Knowledge, understanding and ability to apply the necessary legislation in the exercise of the profession of Engineer.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

OEI7 – Knowledge of the fundamentals and applications of sensing systems in industrial automation

OEI8 – Ability to programming and integration of industrial manipulators in automated cells.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0

EVALUATION	15	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: ENGLISH		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
		6
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
NO	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	YES
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		
LEVEL 3: ENGLISH APPLIED TO ELECTRONIC ENGINEERING		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
		6
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**

ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
NO	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	YES
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Nominal groups. Extensive reading: Chemistry principles: Atoms and molecules. Speaking: Microtext. Verb tenses. Extensive reading: Integrated circuits. Speaking: Microtext. Relative clauses. Extensive reading: Transistors. Speaking: Microtext. Lexis: Word formation. Extensive reading: The planar process. Speaking: Microtext. Expressing logical relations. Writing: Text organization. Speaking: Microtext. Expressing suasion and intellectual attitudes. Writing: Writing from sketches. Speaking: Microtext. Giving factual information. Writing: C.V., application letter. Speaking: Microtext. Scientific symbols, signs and expressions. Writing: Reports and abstracts. Speaking: Microtext.		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
A10 – Ability to work in a multilingual and multidisciplinary environment.		
5.5.1.5.2 CROSS-CURRICULUM		
No data exist		
5.5.1.5.3 SPECIFIC		
No data exist		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	**HOURS**	**PRESENTIALITY**
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		

On-site class: ASSESSMENT		
5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: HEALTH AND SAFETY		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
	8	
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		
LEVEL 3: OCCUPATIONAL HEALTH AND SAFETY		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
	6	
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		

No data exist
5.5.1.2 LEARNING RESULTS
5.5.1.3 CONTENTS
Concepts of Health and Illness. Occupational Health decisive factors. Fundamentals and concepts related to safety and health. Risk assessment: analysis, evaluation and control of specific risks. Accident investigation. Individual and collective protection. Introduction to occupational hygiene: hygienic risk evaluation and assessment. Basics of labor toxicology. Chemical agents. Physical agents, noise and thermal environment. Physical agents, ionizing and non-ionizing radiation. Biological agents, toxic and hazardous wastes. Introduction to ergonomics: working conditions analysis Labor physiology basic concepts. Occupational biomechanics. Musculoskeletal system disorders. Physical workload. Assessment methods of physical load. Mental workload: Psychosocial Risks at Work: Concept. Notions of occupational epidemiology. Legislation and Health.
5.5.1.4 OBSERVATIONS
5.5.1.5 COMPETENCES
5.5.1.5.1 CORE AND GENERAL COMPETENCES
CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.
CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.
CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.
CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.
5.5.1.5.2 CROSS-CURRICULUM
No data exist
5.5.1.5.3 SPECIFIC
OEI9 – Knowledge and use of the principles of the health and safety at Work, techniques for assessing the risks of accidents, measures and adequate means for their prevention.
OEI10 – To know the responsibilities of the occurrence of accidents, features and methods in solving working disputes.
OEI11 – To understand the risk assessment of a company and its preventive measures.
OEI12 – To know the basics of scientific documentation and information sources in industrial hygiene. Knowledge of the fundamentals of occupational diseases research.
OEI3 – To understand the specificity of modelling languages and hardware simulation and to manage VHDL.
5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY

CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK
On-site class: ASSESSMENT

5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0

LEVEL 2: COMPUTING		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
		6
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		

LEVEL 3: COMPUTING SYSTEMS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
OPTIONAL	6	Semester
DURATION		

ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
		6
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**

OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

LIST OF MENTIONS

No data exist

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Databases.

Scientific programming using Matlab.

Visual event-driven programming.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.

A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

OEI14 – Knowledge and ability to apply knowledge of databases.

OEI15 – Basic knowledge of computer systems and programming aimed at industrial applications.

OEI16 – Ability to apply knowledge of mathematics, science and engineering to implement algorithms in programming language.

OEI17 – Basic knowledge of visual programming.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS

On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)

Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)

Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: PHYSICS		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
		6
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		
LEVEL 3: EXTENSION OF PHYSICS		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
		6
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**

NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

LIST OF MENTIONS
No data exist
5.5.1.2 LEARNING RESULTS
5.5.1.3 CONTENTS
Fundamentals of Modern Physics Matter Structure Matter Properties Optics and Acoustics
5.5.1.4 OBSERVATIONS
5.5.1.5 COMPETENCES
5.5.1.5.1 CORE AND GENERAL COMPETENCES
CB1 – Ability to prove, recall and understand knowledge in a field of study which are supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, includes also some aspects which imply knowledge of the forefront of their area of study.
CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.
CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.
CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.
A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.
A10 – Ability to work in a multilingual and multidisciplinary environment.
5.5.1.5.2 CROSS-CURRICULUM
No data exist
5.5.1.5.3 SPECIFIC
OEI8 – Ability to programming and integration of industrial manipulators in automated cells.
OEI9 – Knowledge and use of the principles of the health and safety at Work, techniques for assessing the risks of accidents, measures and adequate means for their prevention.
5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)

E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: INDUSTRIAL ORGANIZATION		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
		6
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		
LEVEL 3: OPERATIONS MANAGEMENT		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
		6
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

LIST OF MENTIONS
No data exist
5.5.1.2 LEARNING RESULTS
5.5.1.3 CONTENTS
Functions of operations management. Facilities location. Design, capacity and distribution of installations. Planning and analysis of processes. Work design and measurement. Total planning and master programming. Materials management: purchase and inventories acquisition. Inventory control. Materials requirements planning. Programming and control of production activities. Project management. Quality control. Maintenance and reliability.
5.5.1.4 OBSERVATIONS
5.5.1.5 COMPETENCES
5.5.1.5.1 CORE AND GENERAL COMPETENCES
CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.
CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.
CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.
A5 – Knowledge to perform measurements, calculations, assessments, appraisals, expert calculations, studies, reports, work plans and similar work.
A6 – Ability to handle specifications, regulations and mandatory rules.
A8 – Ability to apply principles and methods of quality.
A9 – Ability to organise and schedule in the field of business and other institutions and organizations.
A11 – Knowledge, understanding and ability to apply the necessary legislation in the exercise of the profession of Engineer.
5.5.1.5.2 CROSS-CURRICULUM
No data exist
5.5.1.5.3 SPECIFIC
OEI20 – Knowledge, understanding and ability to design and manage production systems and industrial operations.
OEI21 – Basic knowledge and application of environmental technologies and sustainability.
OEI22 – Applied knowledge of business organization in industrial operations.
OEI23 – Knowledge and ability to organise, to manage and control projects.
5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK
On-site class: ASSESSMENT

5.5.1.8 EVALUATION SYSTEMS

ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0

LEVEL 2: STRUCTURES

5.5.1.1 Core Information Level 2

TYPE	OPTIONAL
ECTS LEVEL 2	6

DURATION

ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
	6	
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**

OFFERED IN THE FOLLOWING LANGUAGES

SPANISH	CATALAN	BASQUE
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

LIST OF MENTIONS

No data exist

LEVEL 3: STRUCTURAL AND ASSISTED DESIGN AND ANALYSIS

5.5.1.1.1 Core Information Level 3

TYPE	ECTS SUBJECT	DURATION
OPTIONAL	6	Semester

DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
	6	
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**

OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

LIST OF MENTIONS
No data exist

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS
Charges acting on structures. Structural requirements. Structural materials. Cables and membranes. Triangulated structural systems. Reticulated structural systems. Laminar structural systems. Arcaded structural systems. Mobile structural systems. MEF: theoretical bases. Solving a problem using the MEF. 1D systems analysis. 2D systems analysis. 3D systems analysis.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES
5.5.1.5.1 CORE AND GENERAL COMPETENCES
CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.
CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.
CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.
A1 – Ability to write, sign and develop projects in the field of industrial engineering which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energy facilities, electrical and electronic installations, installations and industrial plants and manufacturing-automation processes.
A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.

A5 – Knowledge to perform measurements, calculations, assessments, appraisals, expert calculations, studies, reports, work plans and similar work.		
5.5.1.5.2 CROSS-CURRICULUM		
No data exist		
5.5.1.5.3 SPECIFIC		
No data exist		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	**HOURS**	**PRESENTIALITY**
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100
5.5.1.7 TEACHING METHODS		
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)		
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)		
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)		
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK		
On-site class: ASSESSMENT		
5.5.1.8 EVALUATION SYSTEMS		
ASSESSMENT SYSTEM	**MINIMAL ASSESSMENT**	**MAXIMAL ASSESSMENT**
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0
LEVEL 2: MECHANICAL ENGINEERING		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
ECTS LEVEL 2	6	
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
		6
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	

NO	NO	
LIST OF MENTIONS		
No data exist		
LEVEL 3: INDUSTRIAL MAINTENANCE		
5.5.1.1.1 Core Information Level 3		
TYPE	**ECTS SUBJECT**	**DURATION**
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	**ECTS Semester 2**	**ECTS Semester 3**
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
		6
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	
LIST OF MENTIONS		
No data exist		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
The industrial maintenance. General information. Types of maintenance. Lubricants in maintaining. Preventive and predictive maintenance techniques. Failure study. Organization of maintenance in an industry. Practice 1. Maintenance management computer aided. Practice 2. Industrial instrumentation (data acquisition systems and sensors). Practice 3. Vibration analysis: Severity of vibration and vibration spectrum analysis. Practice 4. Basic repair techniques: Balanced and aligned.		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CB2 – Ability to apply their knowledge to their work or vocation in a professional way and have the competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.		
CB4 – Ability to communicate information, ideas, problems and solutions to specialized and unskilled audiences.		
CB5 – Ability to develop those learning skills necessary to undertake further studies with a high degree of autonomy.		
A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.		
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.		

A6 – Ability to handle specifications, regulations and mandatory rules.
A9 – Ability to organise and schedule in the field of business and other institutions and organizations.
A10 – Ability to work in a multilingual and multidisciplinary environment.
5.5.1.5.2 CROSS-CURRICULUM
No data exist
5.5.1.5.3 SPECIFIC
C4 – Knowledge and use of the principles of circuit theory and electrical machines.
C7 – Knowledge of the principles of machines and mechanisms theory.
C8 – Knowledge and use of the principles of resistance of materials.
OEI24 – Knowledge of industrial maintenance with emphasis on predictive maintenance.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	60	100
CLASSROOM ACTIVITIES	75	0
EVALUATION	15	100

5.5.1.7 TEACHING METHODS
On-site class: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK…)
Lesson attendance: PRACTICE ACTIVITIES IN CLASSROOM (ACCOMPLISHMENT OF PROBLEMS, ACTIVITIES OF DESIGN, SIMULATION EXERCISE, ACCOMPLISHMENTS OF TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC)
Lesson attendance: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICES, PRACTICES IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL MEDIA CLASSROOM S, IN WORKSHOPS...)
E- Learning: PERSONAL STUDY AND INDEPENDENT WORK
On-site class: ASSESSMENT

5.5.1.8 EVALUATION SYSTEMS

ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING EVALUATION (BETWEEN 0% AND 100% OF THE DEGREE): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OF THE DEGREE): In-class test, minimum two hours and maximum four.	0.0	100.0

5.5 LEVEL 1: END OF DEGREE PROJECT	
5.5.1 Core Data Level 1	
LEVEL 2: END OF DEGREE PROJECT	
5.5.1.1 Core Data Level 2	
TYPE	FINAL DEGREE PROJECT
ECTS LEVEL 2	12
DURATION: Semester	

ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	**ECTS Semester 5**	**ECTS Semester 6**
ECTS Semester 7	**ECTS Semester 8**	**ECTS Semester 9**
	12	
ECTS Semester 10	**ECTS Semester 11**	**ECTS Semester 12**

OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	**CATALAN**	**BASQUE**
YES	NO	NO
GALICIAN	**VALENCIAN**	**ENGLISH**
NO	NO	NO
FRENCH	**GERMAN**	**PORTUGUESE**
NO	NO	NO
ITALIAN	**OTHER**	
NO	NO	

THERE IS NO 3 LEVEL ELEMENTS

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Due to the fact that specific contents of the subject depend on the proposals presented by the Departments involved in the degree, it does not make sense in advance to establish any restriction. Nevertheless, it is necessary to point out that the proposed topics should be useful for students to apply and accomplish the competences associated to the degree title which have been acquired along the qualification (knowledge, abilities, attitudes...) Furthermore, this project should permit the assessment of them and lead to the student's training for professional accreditation as previous requirement to obtain his/her degree title.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CB1 – Ability to prove, recall and understand knowledge in a field of study which is supposed to be from the general secondary education, and is typically at a level which, although it is supported by advanced textbooks, also includes some aspects which imply knowledge of the forefront of their area of study.

5.5.1.5.2 CROSS-CURRICULUM

No data exist

5.5.1.5.3 SPECIFIC

EDP – Exercise to be performed individually and presented and defended in front of an examination board. A project in the field of specific technologies of industrial engineering professional nature where the competencies/skills acquired in the degree teachings are synthesized and integrated.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
CLASSROOM LEARNING ACTIVITIES	4	100
CLASSROOM ACTIVITIES	295	0
EVALUATION	1	100

5.5.1.7 TEACHING METHODS

On-site class: TEACHING TUTORING

E- Learning: PERSONAL STUDY AND INDEPENDENT WORK

On-site class: ASSESSMENT ACTIVITIES (DEFENSE OF THE FINAL DEGREE PROJECT)

5.5.1.8 ASSESSMENT SYSTEMS

ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT

DEFENSE OF THE FINAL DEGREE PROJECT IN FRONT OF AN EXAMINING BOARD	0.0	100.0

6. ACADEMIC PERSONNEL

6.1 TEACHING STAFF AND OTHER HUMAN RESOURCES				
University	**Category**	**Total %**	**Doctors %**	**Hours %**
University of Malaga	Professor	1.97	100.0	25.0
University of Malaga	Professor	6.4	100.0	25.0
University of Malaga	Lecturer	27.1	100.0	25.0
University of Malaga	Lecturer	23.65	0.0	25.0
University of Malaga	Professor hired by a Doctor	8.87	100.0	25.0
University of Malaga	Assistant Doctor	3.94	100.0	25.0
University of Malaga	Assistant	0.49	0.0	25.0
University of Malaga	Associate Professor (includes associated professor from the Faculty of Health Sciences	20.2	0.0	25.0
University of Malaga	Other teaching Personnel with Employment contact	3.44	0.0	25.0

ACADEMIC PERSONNEL

See annex. Paragraph 6

6.2 OTHER HUMAN RESOURCES

See annex, paragraph 6.2

7. MATERIAL RESOURCES AND SERVICES

Justification the available material resources are adequate: See annexes. Paragraph 7.

8. EXPECTED RESULTS

8.1 QUANTITATIVE VALUES ESTIMATION

GRADUATION RATE %	DROPOUT RATE %	EFICIENCY RATE %
15	30	60
CODE	**RATE**	**VALUE %**
No data exist		

Justification of proposed indicators:

See annex. Paragraph 8.

8.2 GENERAL PROCEDURE FOR EVALUATING THE PROCESS AND RESULTS

The regulation of the procedure to be followed at the University of Malaga for assessing the progress and results of student learning, in general, it is contemplated in Article 134 of the Statutes of the University, approved by Decree of the Andalussian Regional Government, number 145/2003, of June 3rd (BOJA of June 9th).

In accordance with the provisions of the aforementioned article, for each academic year, and sufficiently in advance to commence the corresponding school year, the School Meetings, based on the information provided by the relevant departments, shall approve the academic schedule of the teachings that belong to the official qualifications taught in the CENTRE. This program should include, among others, the teaching program of each of the relevant subjects, and this, in turn, shall incorporate the ASSESSMENT SYSTEM of the students' academic performance, setting the type of tests, their number, the criteria for correction and the components to be considered for the student final grade.

The aforementioned ASSESSMENT SYSTEM should, in turn, take into account the provisions of article 124 of the quoted Statutes, which establishes the right of students to do two ordinary exam sessions per academic year.

In addition to the aforementioned procedure, consequence of the current legal regime in the subject, the assessment of progress and results of student learning is also contemplated in the PE03 procedure ("Measurement, Analysis and Continuous Improvement") of the Quality Assurance System, which is

contained in section 9.2 of the Statement, in order to achieve improvement of the teaching quality.

According to the Report on Teaching Innovation in Andalussian Universities (CIDUA), assessment of progress and learning outcomes of students shall be carried out taking into account that the evaluation should be considered as an opportunity to determine the quality of the teaching-learning process and an opportunity for its reformulation and improvement.

The central aim of the evaluation model proposed by the University of Malaga is that the student is aware at all times of his/her learning process, understanding what they learn, Ability to apply it and understand the meaning and social and professional usefulness of learning that they perform. The fundamental methodological support of the teaching project which guides the proposed model framework relies on a combination of individual work, teacher explanations, experimentation in practice, interaction and cooperative work among equals and communication with the tutor.

In summary, it is about transforming the conventional model of oral transmission of knowledge, note-taking and reproduction of what is transmitted in tests and examinations, into a model that reaffirms the tutorial nature of university educational function which caters to the peculiarities of professional and academic learning of each student.

9. QUALITY ASSURANCE SYSTEM

LINK	http://www.politecnica.uma.es/contenidos/general.action?idselectedsection=2&selectedsection=Conoce%20la%20EPS&parentmenu=Garant%EDa%20de%20la%20Calidad&submenu=Manual%20Sistema%20de%20Calidad&idpage=205

10. IMPLEMENTATION CALENDAR

10.1 IMPLEMENTATION TIMELINE

COURSE ENTRY	2010

See annex, paragraph 10.

10.2 ADAPTATION PROCEDURE

REGULATION RULES OF THE ADAPTATION SYSTEM OF THE DEGREE QUALIFICATIONS OF STUDENTS FROM PHASED OUT EDUCATIONS BECAUSE OF THE IMPLEMENTATION OF SUCH QUALIFICATIONS.

Article 1. Field of application.

The current rules are applicable to students at the University of Malaga, with current academic record in the university degrees of official status about to become extinct as a result of the implementation of an official university degree at the university.

Article 2. Adaptation procedure.

1. Students to whom these rules are applicable may be adapted to the corresponding official degree, in any academic year, without having to request the corresponding vacancy through the pre-enrolment procedure.

2. The administrative procedure for executing the adaptation referred by the previous paragraph shall start upon request, addressed to the Dean/Director of the respective Centre of the University of Malaga during the corresponding official period for student enrolment.

3. The aforementioned adaptation shall entail the right to formalise the enrolment as a student of the respective official degree without the need to request for the vacancy through the pre-enrolment process, not either obtain recognition of credits, in accordance with the provisions of the "regulatory standards of the recognition of studies and activities, and work and professional experience, in order to obtain official university Degrees and Master, as well as transfer credits" approved by the Governing Council of the University of Malaga, meeting of June 23rd, 2011.

Article 3. Fighting Procedures curricula.

1. The expiration of the curricula corresponding to the qualifications referred by the article 1 of the current rules shall occur temporarily, year by year, starting from the academic year in which the respective Degree is implemented, but in any case may exceed the date of September 30th, 2015.

2. After each course has been extinguished, six calls to examination of the corresponding subjects shall be made within three academic years, which will be open to students who may apply the current rules and who are enrolled in these subjects in the reference academic year. This possibility of audience shall also affect students who have not previously studied the corresponding subjects, provided the respective ASSESSMENT SYSTEM permits it.

3. Students who exhaust all calls indicated in the previous paragraph without having passed the respective subjects may be adapted to the corresponding official Degree, in the same conditions as indicated in article 2 of the current rules.

TABLE OF ADAPTATION OF CURRENT TEACHINGS WITH THE CORRESPONDING WITH THE DEGREE

Algebra	Linear Algebra
Calculus	Calculus
Advanced Mathematics	Advanced Calculus
Statistics Methods in Engineering	Vector and Statistical Analysis
Physical fundamentals of Electronic Engineering	Physics 1
Advanced physics in Electronic Engineering	Advanced Physics
Basics of Computing	Basics of Computing
Chemistry applied to Electronic Engineering	Chemistry
Graphic Expression and Computed Aided Design	Graphic Expression in Engineering
Business Administration and Organisation of Production	Business Management
Thermodynamics	Science of Materials
Circuits Theory	Fundamentals of Electrical Engineering
Electronic Engineering Equipment	Electronic Engineering Equipment
Industrial Automation	Control Engineering
Mechanical Systems	Theory of Machines
Technical Office	Technical Office
Basics of electrotechnics	Physics 2
Power Electronics	Power Electronics

Power Electronic Laboratory	
Analogue Electronics	Analogue Electronics
Digital Electronics	Digital Electronics
Automatic Regulation	Automatic Regulation
Automatic Regulation Laboratory	Industrial Automation
Industrial Computing	Industrial Computing
Simulation and modeling in System Engineering	Industrial Controllers Design
Digital Electronic Systems Digital Electronic Systems Laboratory	Digital Electronic Systems
Integrated Circuits	Integrated Circuits
Electronic Technology	Electronic Technology
Advanced Digital Systems Advanced Digital Systems Laboratory	Advanced Digital Systems
Electronic Instrumentation Electronic Instrumentation Laboratory	Electronic Instrumentation
Electrical Installations Design Basics of Electrical Machines	Electrical Machines and installations
Microelectronics Laboratory Microelectronics	Microelectronics
Technical English I Technical English II	English Applied to Electronic Engineering
Health and safety at work	Occupational Safety and Health
Management, Planning and Quality Control	Operations Management
Design for manufacturing	Design for manufacturing
Equipment for processes automation	Industrial Robots Programming
Experimental techniques in Electrotechnics	Lighting and Home Automation Techniques

10.3 STUDIES BEING PHASED OUT

CODE	DEGREE - CENTRE
5097000-29009119	Technical Engineer in Industrial Electronics – Higher Polytechnic School

11. RESPONSABLES ASSOCIATED WITH THE APPLICATION

11.1 RESPONSIBLE FOR DEGREE

NIF	NAME	LAST NAME 1	LAST NAME 2
33381949W	ALEJANDRO	RODRÍGUEZ	GÓMEZ
ADDRESS	**POSTAL CODE**	**PROVINCE**	**TOWNSHIP**
Dr. Ortiz Ramos S/N St, 29071- Málaga- Escuela Politécnica Superior	29071	Málaga	Málaga
EMAIL	**PHONE NUMBER**	**FAX**	**CHARGE**
Director.eps@uma.es	670947044	952132694	DIRECTOR OF THE HIGHER POLYTECHNIC SCHOOL

11.2 LEGAL REPRESENTATIVE

NIF	NAME	LAST NAME 1	LAST NAME 2
25084614D	MARIA JOSÉ	BLANCA	MENA
ADDRESS	**POSTAL CODE**	**PROVINCE**	**TOWNSHIP**
EL EJIDO S/N St. PABELLÓN DE GOBIERNO DE LA UNIVERSIDAD DE MALAGA	29071	Málaga	Málaga
EMAIL	**PHONE**	**FAX**	**CHARGE**
blamen@uma.es	952131038	952132694	VICE-RECTOR OF ACADEMIC ORDINANCE AND FACULTY

11.3 APPLICANT

Responsible for title is not the applicant

NIF	NAME	LAST NAME 1	LAST NAME 2
25084614D	MARIA JOSÉ	BLANCA	MENA
ADDRESS	**POSTAL CODE**	**PROVINCE**	**TOWNSHIP**

EL EJIDO S/N St. PABELLÓN DE GOBIERNO DE LA UNIVERSIDAD DE MALAGA	29071	Málaga	Málaga
EMAIL	**PHONE**	**FAX**	**CHARGE**
blamen@uma.es	952131038	952132694	VICE-RECTOR OF ACADEMIC ORDINANCE AND FACULTY AT THE UNIVERSITY OF MALAGA