

APPLICATION FORM FOR THE 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		Electrical Engineering	
SPECIFIC DESIGNATION			
Electrical 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		Order CIN/351/2009, of February 9th, OSG of February 20th, 2009	
APPLICANT			
NAME AND SURNAME		POSITION	
MARIA JOSÉ BLANCA MENA		VICE-RECTOR FOR TEACHING AND ACADEMIC PLANNING	
Type of Document		Document number	
Identity Card		25084614D	
LEGAL REPRESENTATIVE			
NAME AND SURNAME		POSITION	
Maria José Blanca Mena		Vice-Rector for Teaching and Academic Planning	
Type of Document		Document Number	
Identity Card		25084614D	
RESPONSIBLE FOR THE DEGREE			
NAME AND SURNAME		POSITION	
ALEJANDRO RODRIGUEZ GOMEZ		Dean of the Higher Polytechnic School at the University of Malaga	
Type of document		Document Number	
Identity Card		33381949W	
2. ADDRESS FOR NOTIFICATION PURPOSES			
NOTIFICATIONS of all procedures relating to this application, communications must be sent to the address shown in this paragraph.			
ADDRESS	POSTAL CODE	CITY	TELEPHONE
Plaza El Ejido s/n PABELLON DE GOBIERNO DE LA UNIVERSIDAD DE 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 the personal data .

The applicant acknowledges the terms of the registration and agrees to comply with the requirements thereof, and expressly consenting to the notice telematically 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 AGREEMENT
Degree	Electrical Engineering Degree at the University of Malaga	No		See annexes. Section 1.
LIST OF MENTIONS				
No data				
BRANCH		ISCED 1	ISCED 2	
Engineering and Architecture		Electricity and Energy	Engineering and related professions	
ENABLING FOR REGULATED PROFESSION:		Technical Industrial Engineer		
RESOLUTION	Resolution of January 15, 2009, OSG January 29, 2009			
REGULATION	Order CIN/351/2009, of February 9th, OSG of February 20, 2009			
ASSESSMENT AGENCY				
Andalusian 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	CORE EDUCATION CREDITS	CREDITS IN INTERNSHIPS
240	60	0
OPTIONAL CREDITS	COMPULSORY CREDITS	DEGREE FINAL PROJECT CREDITS / MASTER
30	138	12
LIST OF MENTIONS		
MENTION		OPTIONAL CREDIT
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 TAUGHT IN THE CENTRE		
CLASSROOM	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/secretariageneral/normativa/propia/consejo/Junio_2011/Anexo04.pdf		
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	

2. JUSTIFICATION, ADEQUACY FOR PROPOSAL AND PROCEDURES

See annexes, section 2.

3. COMPETENCES

3.1 CORE AND GENERAL COMPETENCES
CORE COMPETENCES
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.
CC2 - To know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.
CC3 - 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.
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.
GENERAL COMPETENCES
A1 - Ability to write, sign and develop projects in the industrial engineering field which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological branch, construction, alteration, repair, conservation, demolition, manufacture, installation, assembly 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 analyze and evaluate the social and environmental impact of technical solutions.
A8 - Ability to apply principles and methods of quality.
A9 - Ability to organise and planning in the field of business and other institutions and organisations.
A10 - Ability to work in a multilingual and multidisciplinary environment.
A11 - Knowledge, understanding and ability to apply the necessary legislation in the profession exercise of Technical Engineer.
3.2 CROSS-CURRICULAR COMPETENCES
No data
3.3 SPECIFIC COMPETENCES
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 differential equations; numerical methods; numerical algorithms; statistics and optimization.
B2 - Understanding and mastering the basic concepts of the general laws of mechanics, thermodynamics, electrical fields, waves, electromagnetism and their application for solving problems of engineering.
B3 - Basic knowledge on using and programming computers, operating systems, databases and software with applications in engineering.
B4 - Ability to understand and apply the principles of basic knowledge of general, organic and inorganic chemistry and their applications in engineering.

B5 - Ability to have spatial vision and knowledge of mapping techniques, both by traditional methods of metric geometry and descriptive geometry and as computer-aided design applications.
B6 - Adequate knowledge of the business concept, institutional and legal framework of the company. Organisation and business management.
C1 - Knowledge of applied thermodynamics and heat transfer. Basic principles and their application to solving engineering problems. Basic knowledge and application of environmental technologies and sustainability.
C2 - Knowledge of the basic principles of fluid mechanics and their application to solving problems in the field of engineering. Calculating pipes, channels, and fluid systems. Basic knowledge and application of environmental technologies and sustainability.
C3 - Knowledge of the fundamentals of science, technology and chemistry of materials. Understand the relationship between the microstructure, synthesis or processing and properties of materials. Basic knowledge and application of environmental technologies and sustainability.
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. Basic knowledge and application of environmental technologies and sustainability. Applied knowledge of business management.
C10 - Knowledge and skills to organise and manage projects. Knowledge of the organisational structure and functions of a technical office. Basic knowledge and application of environmental technologies and sustainability. Applied knowledge of business management.
E1EE - Ability to calculation and design of electrical machines.
E2EE - Knowledge of the control of electrical machines and drives and their applications.
E3EE - Applied knowledge of power electronics.
E4EE - Ability to calculation and design of low and medium voltage electrical installations.
E5EE - Ability to calculation and design of high voltage electrical installations.
E6EE - Ability to calculation and design of power lines and electric power transport.
E7EE - Knowledge of electric power systems and their applications.
E8EE - Knowledge of the principles of automatic control and their applications to industrial automation.
E9EE - Ability to power station design.
E10EE - Applied knowledge of renewable energies.
T1EE - Knowledge of heat engines. Basic principles and their application as electric power generation elements.
T2EE - Knowledge of modelling and analysis of linear systems in state space.
T3EE - Knowledge of design techniques of continuous and discrete time control systems by means of internal description (state variables).
OEE1 - Knowledge of modelling and analysis of linear systems in state space.
OEE2 - Knowledge of design techniques of continuous and discrete time control system by means of internal description (state variables).
OEE3 - Ability to apply the principles of the Health and Safety at Work, techniques for assessing the risks of accidents, measures and adequate means for its prevention.
OEE4 - Students should know the means of collective and individual protection.
OEE5 - To understand the significance and need for safe working conditions.
OEE6 - To know the responsibilities of the occurrence of accidents, features and methods in solving labor disputes.
OEE7 - To know in detail the basics of Safety Inspection and Accident Investigation. Methodology and implementation.
OEE8 - To know the different types of reporting accidents.

OOE9 - To understand and know the risk assessment of a company and its preventive measures.
OOE10 - To know how to calculate and interpret statistical indices of most common accidents and perform critically an evaluation of them.
OOE11 - To know the basics of scientific documentation and information sources in industrial hygiene. Knowledge of the fundamentals of the investigation of occupational diseases.
OOE12 - To know the main hygiene, physical, chemical and biological risks.
OOE13 - To know the pollutants in hospitals and the mechanisms of evolution, control and their prevention.
OOE14 - To know the basics of Ergonomics, objectives, branches, and its usefulness in prevention.
OOE15 - To be able to collaborate with the preventive planning of a company and know aspects related to the promotion of health at work.
OOE16 - Basic knowledge of first aid at company level.
OOE17 - Knowledge, understanding and ability to design and manage production systems and industrial operations.
OOE18 - Basic knowledge and application of environmental technologies and sustainability.
OOE19 - Applied knowledge of Business Organisation in Industrial Operations.
OOE20 - Knowledge and ability to organise, manage and control projects.
OOE21- Ability to programming and integration of industrial manipulators in automated cells.
OOE22 - Knowledge and ability to apply database knowledge.
OOE23 - Basic knowledge of computer systems and programming aimed at industrial applications.
OOE24 - Ability to apply knowledge of mathematics, science and engineering to implement algorithms in a programming language.
OOE25 - Basic knowledge of visual programming.
OOE26 - Knowledge of technological applications that have been developed from contemporary physics principles.
OOE27 - Ability to design and improve technological devices through the knowledge of operating physical laws.
OOE28 - Ability to design electronic and industrial instrumentation systems.
OOE29 - Ability to manage electronic instrumentation based on PC.
OOE30 - To know typical terminology, symbology and regulations associated to the electrical measurement field.
OOE31 - To control different measurement methods and skills, selecting the most suitable for each moment.
OOE32 - Knowledge of the basics of electrical safety associated to carrying out the measure, at both the laboratory and the industry.
OOE33 - To be able to estimate the accuracy and the uncertainty of the measurement made.
OOE34 - To be able to handle measurement devices (electrical and electronic) needed to make the appropriate measurements for the moment required.
OOE35 - To know disturbance problems in electric power systems.
OOE36 - To know the wave quality measure in power systems.
DFP - Exercise to be performed individually and present and defend in front of an examination board, this is a project in the field of specific technologies of Industrial Engineering of professional nature in which synthesize and integrate the competences/ skills acquired in the degree teachings.

4. ACCESS AND ADMISSION OF STUDENTS

4.1 PREVIOUS INFORMATION SYSTEMS

See annexes. Section 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, section 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 to 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 centres, may also be made use, 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 official university degree and the procedure for admission to the Spanish public universities, the Royal Decree 1892/2008, of November 14th (OSG number 283, on 24-11-2008) has been dictated.

According to the provisions of the aforementioned Royal Decree to access the official university degree 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 ordination of the education system regulated by the Organic Law 1/1990 of October 3rd, of General Organisation 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 on 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, of Universities. 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 work or 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 possess any academic degrees enabling access to the university by other means; and being unable to accredit working or 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 ordinance 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 recognised 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 teaching 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 of Education 2/2006 of June 3rd, 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 organisation 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 of Education 2/2006 of June 3rd, 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 recognised foreign studies to access to Faculties, Higher Technical Schools and University Colleges are regulated, amended by Order of May 13th, 1993, and the Order of May 4th, 1994.

The entrance test for people over than 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 over 25 people 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 calculating 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 to university teachings leading to obtaining official degrees since Vocational Education, according to the preemption provisions established in Annex II of Royal Decree 1892/2008.

Access through accreditation of working or 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 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 %
Student with university degree or equivalent	1 %	3 %

Furthermore, five percent of the seats available for students who have recognised a disability degree 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 university shall be reserved for those who accredit their status as top-level or high performance athletes and meet the corresponding academic requirements. 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 of available places for these athletes, although the quota may be increased.

According to the provisions of article 75 of Andalusian Law of Universities 15/2003, for the sole purposes of admission to the university centres, all Andalusian 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 Andalusian Council of Universities.

It has not been established conditions or special access test to the degree to which this report refers.

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 teamcooperation
- Personal workorganisation
- Ability to workunder 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 communicationcapability
- 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, it will be applied to the admission procedures to university from the academic year 2010-2011. Until reached that point, the admissions of students in the Andalusian universities are governed by the rules agreed in 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

4.3. - Support for students.

4.3.1. - Welcoming to the new students.

Hosting action: academic event in which the management team of the Higher Polytechnic 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 centre infrastructure, information technology, website, virtual 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 industrial engineering sub-branch.

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 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 sensibility 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 Disabled Students (SAAD).

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 counseling 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: benches, tables, 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. Section 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 Government Council Agreement, 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 Education Cooperation Programmes (Internships).
- Work or professional experience not related to Education Cooperation Programmes.
- Participation in cultural, sporting, student representation, charity and cooperation university activities.

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 enrollment period (for new students in the respective Centre and degree of the University of Malaga), or during 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 Degree Final 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 core 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, when 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 educations which have been used by the applicant for access to the degree of destination.
- The recognition of accredited working or professional experience not related to Education 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 Education 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 competence 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 enrollment 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 described 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 the 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 their 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

NUMBER OF CREDITS	36
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1. ADAPATATION COURSE DESCRIPTION					
1.0. TITLE:					
UNIVERSITY EXPERTISE OF ADAPTATION TO ELECTRICAL ENGINEERING DEGREE					
1.0.2. Field (Tick appropriate, only one field)					
☐	Health Sciences				
☐	Sciences				
☐	Social and Legal Sciences				
☐	Art and Humanities				
☒	Engineering and Architecture				
1.1. CENTRES/S WHERE TEACHINGS TAKE PLACE:					
1.1.1. Place of teaching (classroom, virtual campus...)					
(Space reservation will be detailed)					
HIGHER POLYTECHNIC SCHOOL					
1.2. TYPE OF TEACHING:					
☐	Classroom	☒	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:

Identity Card:

MOLINA MALDONADO RAFAEL

23783132-M

Category:

UNIVERSITY PROFESSOR

Knowledge area:

ELECTRICAL ENGINEERING

Department:

ELECTRICAL ENGINEERING

ACADEMIC VICE-RECTOR:

Name and surname:

Identity Card:

RODRIGUEZ GOMEZ ALEJANDRO

33381949-W

Category:

UNIVERSITY PROFESSOR

Knowledge area:

ELECTRICAL ENGINEERING

Department:

ELECTRICAL ENGINEERING

CONTACT DATA AND INFORMATION:

Phone/s:

E-mail:

951952310

inmamruiz@uma.es

1.5. NUMBER OF OFFERED SEATS:

Minimum number of students:

15

Maximum number of students:

30

1.6. NUMBER OF EUROPEAN CREDITS OF THE DEGREE:

36 ECTS

1.7. BRIEF DESCRIPTION OF THE COURSE:

This itinerary consists in a blended learning course which provides the necessary competences to complete the formation of graduates in Industrial Engineering, speciality of Electricity, opting to the Electrical Engineering Degree.

1.8. SYLLABUS:

Module I: Competence updating with 36 ECTS divided into six subjects of 6 ECTS each: MATERIALS SCIENCE, AUTOMATIC CONTROL, THEORY OF MACHINES, MANUFACTURING ENGINEERING, STRENGTH OF MATERIALS AND ELECTRICAL ENGINEERING.

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/economia/innovacioncienciayempleo/>

Application period:

Start date

End date

September 9, 2013

September 21, 2013

Enrollment 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

Installment 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 (OSG 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 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 Subdirector General of Academic Coordination and Legal System of the Directorate General of University Policy of the General Secretariat of Universities, Ministry of Education.

According to the previous paragraph, we must observe:

1) The syllabus 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 RDs is established, first, that the global teachings in no case shall be less than 205 credits or higher than the maximum of credits that 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 teachings in the degree of Technical Engineering in Industrial Design in no case shall be less than 180 credits.

2) The syllabus (corresponding to the degrees of Technical Industrial Engineering, in their 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 will not be less than 10% of the overall teachings of the syllabus leading to the award of the official degree chosen. 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 core subject the Degree Final Project.

5) The RD 1954/1994 of September 30th, on recognition of degrees to the catalogue Official University Degrees, created by the RD 1497/1987 of November 27th.

Since previous studies, to the effective day 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 reasonable that any graduated in Technical Engineering of the Industrial Branch had 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 graduated 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 core subjects, plus 12 ECTS credits corresponding to the Degree Final 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 specific itinerary will depend on the specific studied technology (industrial design, industrial electronics, electricity, mechanics or industrial chemistry). The skills to be developed in each specific itinerary of the Adaptation Course would be focussed primarily on the training competences common to the industrial branch or product engineering.

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

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

COMPETENCES

3.1. Objectives reflecting the overall orientation of the degree

Core objectives:

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 upgrade the Technical Industrial Engineers specialized in Electricity into new competences emerged after the implementation of the new degrees within the European Higher Education Area.

3.2. Core and specific competences 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 Deans of the Andalusian Public University System that provide Technical Engineering degrees. These competences were selected from the Ministerial Order CIN/351/2009, recollecting all those which were not covered by any of the Technical Engineering degrees of the aforementioned faculties, 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 date of November 26th, 2012.

COMPETENCE	DEFINITION
CORE COMPETENCES RD 1393/2007	- Students should demonstrate knowledge and understanding in the area of Electrical Engineering and Industrial branch from general secondary education, and their level is supported by advanced textbooks also includes some aspects which imply knowledge of the state of the state of the art of Electrical Engineering and Industrial branch. - Students should be able to apply their knowledge to their work or vocation in a professional way and show competences typically demonstrated through devising and defending arguments and solving problems within Electrical Engineering and Industrial branch. - Students must be able to communicate information, ideas, problems and solutions to both specialist and non-specialist audiences. - Students should have developed the skills needed to undertake further study with a high level of autonomy.
CORE COMPETENCES MO CIN 351/2009	Ability to write, sign and develop projects in the field of industrial engineering aimed, according to the knowledge acquired as core competences formation

	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 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 competences Industrial Branch MO CIN351/2009	- Knowledge of fundamentals of science, technology and chemistry of materials. To understand the relation between microstructure, processing and properties of materials. - Knowledge of the basics of automation and control methods. - Knowledge of the principles of theory of machines and mechanisms. - Knowledge and use of the strength of materials principles. - Basic knowledge of the production and manufacturing processes. - Basic knowledge and application of environmental technologies and sustainability. - Knowledge on electric power systems and their applications. - Applied knowledge on renewable energies. - Knowledge of the control of electrical machines and drives and their applications. - Applied knowledge of power electronics.

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

PRIOR INFORMATION SYSTEM

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

B. Information Day. An information day on the specific adaptation course 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 relevant 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 Andalusia Public Universities will need to be completed and submitted on the following electronic access point:

<http://www.juntadeandalucia.es/economia/innovacioncienciayempleo/>

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 not less than one week. Universities also make public such periods on the notice boards of their Admissions Offices:

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

WELCOMING PROCEDURE AND GUIDANCE

An academic event is performed, there 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, virtual campus of the University of Malaga and some question time.

4.2 Access requirements and conditions or special Access tests

Accessing the university education is an act regulated and 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 with "full respect for fundamental rights and 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 Andalusia for the admission procedure is set to specific curricular itineraries for those having a degree or 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 Technical Industrial Engineering Degree, specialized in Electricity obtained according to plans regulated by the Organic Law 11/1983 studies, August 25, University Reform, make 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, specialized in Electricity.

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 greater 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.

The record is assessed on the maximum possible score 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 score in this section, he/she shall be given the maximum level, while the valuation of the other contestants will be proportionately. Therefore both, the score achieved as the total points scored in the competition must be regarded solely as a relative measure established 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.

SUPPORT AND GUIDANCE TO STUDENTS ONCE REGISTERED.

Once registered students are informed of the structure and organisation 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, of 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 Electrical Engineering Degree includes 240 credits, the maximum credits that could recognise are 36 credits.

As is reflected in the agreement of the Committee of Degrees of the Industrial Branch in the Andalusia Public University System, 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 for each teaching method

TEACHING METHODS	EUROPEAN CREDITS
Theoretical/practical teaching in classroom	24 ECTS
On-line teaching	12 ECTS
Internships in companies	0 ECTS
Degree Final Project for Adaptation Course	0 ECTS
EUROPEAN TOTAL CREDITS	36 ECTS
Total of classroom hours (theory/practice)	180
Total hours of students work (25 hours x 1 credit)	900

5.1.2. General explanation of the Syllabus planning

The Adaptation Course is established as one semester; lectures will be performed every Friday from 16h-21:30 pm and Saturdays from 8:45-14:15 h.

Lectures are complemented by on line classes supported by the platform campusvirtual.uma.es with activities and material included:

- Monitoring activities and study
- A theoretical and practical teaching material
- Problems
- Further reading
- Training test and and/or assessment of each module / subject
- Consultations by email and / or discussion forums

This structure will allow 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 qualification systems".

5.2. Detail description of the modules / matters / subjects of the teachings in the Syllabus

GENERAL INFORMATION	
Designation of the Module	Module: Competence updating Subject: Materials Science, Automatic Control, Theory of Machines, Strength of Materials, Manufacturing Engineering, Electrical Engineering.
Number of European Credits (classroom / online): 36 ECTS (6 ECTS each subject). Blended learning.	
Nature (Compulsory/Optional): Compulsory	
Duration: Semester	

5.2.1 Competences

COMPETENCE	DEFINITION
CORE COMPETENCES RD 1393/2007	- Students should demonstrate knowledge and understanding in the area of the Electrical Engineering and Industrial branch from general secondary education, and their level is supported by advanced textbooks also includes some aspects which imply knowledge of the state of the art of Electrical Engineering and Industrial branch. - Students should be able 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

	- Students must be able to communicate information, ideas, problems and solutions to both specialist and non-specialist audiences. - Students should have developed the skills needed to undertake further study with a high level of autonomy.
CORE COMPETENCES MO CIN 351/2009	- Ability to write, sign and develop projects in the field of industrial engineering aimed, according to the knowledge acquired as core competences formation, common in the industrial and technological branch, construction, alteration, repair, conservation, demolition, manufacture, installation, assembly or operation of: structures, mechanical equipment, energy 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 Competences Industrial Branch MO CIN351/2009	- Knowledge of fundamentals of science, technology and chemistry of materials. To understand the relation between microstructure, processing and properties of materials. - Knowledge of the basics of automation and control methods. - Knowledge of the principles of theory of machines and mechanisms. - Knowledge and use of the strength of materials principles. - Basic knowledge of the production and manufacturing processes. - Basic knowledge and application of environmental technologies and sustainability. - Knowledge on electric power systems and their applications. - Applied knowledge on renewable energies. - Knowledge of the control of electrical machines and drives and their applications. - Applied knowledge of power electronics.

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

- Theoretical and practical lectures 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 aptitudinal and attitudinal competences.
- Assessment, which will ensure the achievement of 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 will be required a meeting with the participating professors before the course starts to program the sequence of contents, establishing teachings student and temporarily coordinate assessments and work required in the different subjects.

5.2.4 Assessment and qualification systems

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

Therefore, the proposed system is a competences evaluation system that 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 that 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. Assistance to lectures.

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 virtual campus platform so that they can be performed by students of they achieve the grades automatically.

The final assessment system of this subject is expressed numerically, according to the provisions of art. 5 of Royal Decree 1125/2003, of September, 5 (OSG 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 Electrical Engineering from the University of Malaga.

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.

AUTOMATIC CONTROL

In this subject studied tools needed to dynamic system simulation and modelling are presented and subsequently can perform the analysis of these systems in continuous and discrete time and be able to implement the control system design.

THEORY OF MACHINES

The content of this subject corresponds to a basic mechanism course. In the first part both dynamic as kinematic mechanism analysis are studied. In the second part the balancing and flywheel are analyzed. Then, vibrations in mechanical systems are examined.

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 organisation of production. Finally, the concepts of quality manufacturing engineering are introduced.

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.

ELECTRICAL ENGINEERING

They are three differentiated parts in this subject. In the first part, knowledge and tools for the operation of electric power systems are described, starting with state estimation and economic dispatch of these systems and timetables and automatic control of thermal plants and energy generation, covering transport network processes and electric power markets.

In the second part, the current situation of distributed electric power generation systems is examined, with the production through renewable energies: solar, wind power and geothermal, analyzing calculation, design and sizing of these electric power systems.

The last part is based on electric drives analyzing the control of dc machines, induction motors, synchronous machines and step motors.

5.2.6 Module Contents:

Credits

1.-	Materials Science: Introduction, Material structure. Material features. Metallic material study, Ceramic material study. Polymeric material study. Composite material study	6
2.-	Automatic Control: Dynamic system modelling and simulation. Analysis of dynamic systems in continuous and discrete time. Introduction to control system design	6
3.-	Theory of Machines: Introduction to mechanism study. Kinematic analysis of planar mechanisms. Dynamic analysis of mechanisms. Balancing. Flywheels. Vibrations	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.-	Strength of Materials: Introduction to elasticity and strength of materials. The elastic solid. Yield and 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
6.-	Electrical Engineering: Operation of Electric Power System. Generation with renewable energies. Electric Drives.	6
Total credits		36

ACADEMIC

6.1. Professors and other necessary and available human resources to carry out the proposed curriculum. Including information about adequacy.

Name and Surname (Firstly faculty of the UMA and then another professor arranged alphabetically by surname and name)	Identity Card	Department/ Company of origin	Category	Credits for each Professor	Module/ matter/ subject	Lectures hours
AGUADO SANCHEZ, JOSE	25684384-P	Electrical Engineering	Lecturer	0.8	Competence updating / Electrical Engineering	4
CABRERA CARRILLO, JUAN	25665736-J	Mechanical Engineering	Lecturer	3	Competence updating /	15

					Theory of Machines	
CARDENAS CADIERNO, JOSE	28523839-K	System Engineering And Automatics	Lecturer	6	Competence updating / Automatic Control	30
GARCIA GONZALEZ, JUAN B.	27328627-G	Electrical Engineering	Lecturer	1	Competence updating / Electrical Engineering	5
LOZANO GUARDEÑO, MANUEL	77470041-S	Civil, Materials and Manufacturing Engineering	Associated Lecturer	3	Competence updating/ Manufacturing Engineering	15
LOPEZ TABOADA, CARLOS	34990022-F	Civil, Materials and Manufacturing Engineering	Associated Lecturer	1.5	Competence updating / Strength of Materials	7.5
LOPEZ VAZQUEZ, JOSE J.	25098656-K	Electrical Engineering	Lecturer	0.8	Competence updating / Electrical Engineering	4
MARTIN FERNANDEZ, FRANCISCO	25069640-P	Civil, Materials and Manufacturing Engineering	Lecturer	3	Competence updating/ Manufacturing Engineering	15
MOLINA MALDONADO, RAFAEL	23783132-M	Electrical Engineering	Lecturer	0.8	Competence updating / Electrical Engineering	4
MUÑOZ GUTIERREZ, FRANCISCO	25059684-B	Electrical Engineering	Lecturer	0.8	Competence updating / Electrical Engineering	4
NADAL MARTÍNEZ, FERNANDO	27389062-H	Mechanical Engineering	Associated Lecturer	3	Competence updating / Theory of Machines	15
PAZ GUTIÉRREZ, MARCOS	33355476-W	Civil, Materials and Manufacturing Engineering	Associated Lecturer	6	Competence updating / Materials Science	30
PEDRAZA RODRIGUEZ, CONSOL.	75540725-P	Civil, Materials and Manufacturing Engineering	Lecturer	1.5	Competence updating / Strength of Materials	7.5
RODRIGUEZ GOMEZ, ALEJANDRO	33381949-W	Electrical Engineering	Lecturer	0.8	Competence updating / Electrical Engineering	4
RODRIGUEZ TREITERO, ANTONIO	24151098-V	Electrical Engineering	Lecturer	0.9	Competence updating / Electrical Engineering	5
SANCHEZ BERROCAL, JUAN	25591601-F	Civil, Materials and Manufacturing Engineering	Associated Lecturer	1.5	Competence updating / Strength of Materials	7.5
VEINTIMILLA ALCAS, JORGE	77322372-Y	Civil, Materials and Manufacturing Engineering	Lecturer	1.5	Competence updating / Strength of Materials	7.5

6.2. Evaluating the adequacy of Professors

All participating Professors belonging to the Knowledge Areas which are associated to the Degree subjects and, therefore, faculty participants possess sufficient experience and required experience to teach the subjects in the adaptation course, if included on the Human Resources Verified Memory of the Degree of Electrical Engineering.

6.3. Human Resources: administrative or technical support

Administrative management:

Name and Surname: NIEVES SERRANO MARTÍN **Department or contact location:** Administrative Secretary Phone: 951 952 478 **E-mail:** mnserrano@uma.es

Name and Surname: M^a VICENTA BLANEZ RUIZ **Department or contact location:** Administrative Secretary Phone: 951 952 479 **E-mail:** mvblanes@uma.es

Name and surname: ANA LÓPEZ GARCÍA **Department or contact location:** Administrative Secretary Phone: 951 952 480 **E-mail:** anastasi@uma.es

Name and surname: M^a CARMEN SALAS ARENAS **Department or contact location:** Administrative Secretary Phone: 951 952 482 **E-mail:** mcsalas@uma.es

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Justification of the adequacy of the material resources and available services

Material resources and services accomplish the degree ones

Physical location: Higher Polytechnic School

Virtual Campus: campusvirtual.uma.es

7.2 Forecast acquisition of material resources and services.

The acquisition of material resources and services are not expected, because the necessary resources are available.

8.1. Estimated quantitative rates for the indicators and their justification

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

8.2. Introduction of new indicators (if applicable)

Name	Definition	Estimated Rate
Degree Efficiency Rate:	(Total number of credits passed by students in the course x / total credits which are needed to enroll) * 100. This indicator aims to analyze how much it costs the students to pass the credits of the Syllabus. x: Previous course to indicator measurement.	100%

8.3. Justification of the estimates.

To estimate the indicators, the rates employed in the application for verification of the Electrical Engineering Degree at University of Malaga were considered, validated by ANECA, but considering more positive and higher rates because it is a course which is specifically aimed at graduates in Engineering with proved training and ability.

9. QUALITY ASSURANCE SYSTEM OF THE DEGREE

The Quality Assurance System of the Adaptation University Electrical Engineering Degree 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 Responsible of system quality assurance Syllabus.

It includes the Quality Assurance Committee 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 analyze the results of the Degree.

Recollection of data.

The Committee of Quality Assurance of the Degree will analyze 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, Strategic Planning and Social Responsibility Service, which will be responsible for their valuation as long as the data are in the database of the University of Malaga.

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

Information Analysis and Improvement of the System

The Committee of Quality Assurance will be responsible for analyzing 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 programmes.

Not applicable

9.4 Procedures to analyze labor insertion of graduates and satisfaction with their training.

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

Recollecting of Data.

Quality, Strategic Planning and Social Responsibility Service will support the Section of the Degrees and Quality Assurance Commission 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 analyze the results of the Questionnaire of Graduated and the result of the following indicators:

- Employability of the degree: percentage of students who start to work within two years after completing the degree.
- Average time for employability of the degree: average time that 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 the Improvement Plan.

9.5 Procedure to analyze the satisfaction of the groups involved (students, academic staff and administration and services, etc.) and to receive the 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 organisation 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, Strategic Planning and Social Responsibility Service will prepare the model questionnaires, as directed by the Degree Section.

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

Information Analysis and Improvement of the System

The Committee of Quality Assurance will be responsible for analyzing 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 that the Commission on Quality Assurance establishes once all the results of the system are measured, including derivatives valuation 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, Strategic Planning and Social Responsibility Service, 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 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 on 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 analyzing and processing the complaints, suggestions and compliments related to the Degree. Annually the Quality, Strategic Planning and Social Responsibility Service 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 the Degree, as well as to prepare the Improvement Plan.

5. PLANNING OF THE TEACHING

5.1 DESCRIPTION OF THE SYLLABUS		
See annexes. Section 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		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
Classroom: ACTIVITIES OUTSIDE THE UNIVERSITY (fieldworks, visits to centres/institutions, practices in companies...)		
Classroom: SEMINARS/WORKSHOPS (review, discussion, debate...)		
E-Learning: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
E-Learning: PRACTICAL ACTIVITIES (Problems, Projects, Designs, Case Studies...)		
E-Learning: DOCUMENTATION ACTIVITIES (Bibliographic/Documentary Research, Text Commentary, Glossaries, Databases...)		
E-Learning: DOCUMENTS (Reports, Memories, Essays, Dossier, Diaries...)		
E-Learning: DISCUSSION ACTIVITIES AND DEBATE (Participation in forums, Wikis, Chats, On-line Seminars...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
Classroom: TUTORING		
Classroom: ASSESSMENT ACTIVITIES (DEFENSE OF THE DEGREE FINAL PROJECT)		
5.4 ASSESSMENT SYSTEMS		
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.		
FINAL EXAM (between 20% and 80% of out of grades: In class test, two hours minimum - four hours maximum.		
DEFENSE OF THE DEGREE FINAL 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. Rouché, Gauss, Gauss-Jordan.

Vector spaces: Linear applications: eigenvectors and eigenvalues. Diagonalisation of matrices.

Numerical linear algebra: mistakes, Numerical solution of equations and system of equations.

Calculation of eigenvalues and eigenvectors.

Euclidean and affine space: Metric and affine problems in the plane and three-dimensional space.

Affine applications: Motion, conical and quadratic.

Matrix exponential. Linear systems of differential equations and n-order linear differential equations.

Using mathematical packages for spatial representation and problem solving.
CALCULUS

The real and complex number.

Real function of a real variable: Limits, continuity and differentiability: Graphical representation of curves (explicit, parametric and polar). Integration of real functions of a real variable. Primitives.

Physical and geometric applications. Numerical solution of non linear equations. Seminars on graphing functions in one and several variables and curve fitting to a dataset.

Numerical series and series of function: Taylor series and Fourier series.

Integration of real functions of a real variable. Primitives. Physical and geometric applications.

Interpolation and approximation of functions. Derivation and numerical integration.

Vector fields and scalar fields. Limits and differentiability of fields. Taylor's theorem.

Maxima and minima, conditioned extrema.

Using mathematical packages in order to represent functions and problem solving.
VECTOR AND STATISTICAL ANALYSIS
Differential geometry: Curves and areas in space, Frenet trihedron, Gaussian and mean curvature for areas.

Line integral. Double and triple integral. Surface integral. Integral theorems. Use of mathematical packages in order to represent curves and areas and problem solving. Dimensional and two-dimensional descriptive statistics.

Introduction to discrete mathematics: Use of numerical algorithms and counting techniques. Calculus of probability. Random variables and fundamental distributions. Confidence intervals and hypothesis testing.

Use of mathematical packages for data processing.
ADVANCED CALCULUS
Ordinary differential equations (ODE) of first order.

High order ODE.

Laplace transform.

Numerical solution of differential equations and differential equation systems.

Complex variable methods.

Partial differential equations.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CC3 - 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.

CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.

CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULAR COMPETENCES

No data

5.5.1.5.3 SPECIFIC COMPETENCES		
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 differential equations; numerical methods; numerical algorithms; statistics and optimization.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades: In class test, two hours minimum - four hours maximum.	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 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: Physics 1		
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: Physics 2		
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		
PHYSICS 1 Particle 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		
CC3 - 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.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop 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-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
B2 - Understanding and mastering the basic concepts of the general laws of mechanics, thermodynamics, electrical fields, waves, electromagnetism and their application for solving problems of engineering.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		

SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENTS SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: TECHNICAL DRAWING		
5.5.1.1 Core Information Level 2		
TYPE	BRANCH	SUBJECT
CORE	Engineering and Architecture	Technical Drawing
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: Technical drawing 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 Standardization principles Dihedral representation system I: General Principles Representation Systems II: Dihedral (Distances) Representation Systems III: Dihedral (Angles) Representation Systems IV: Dihedral (Plane section) Representation Systems V : Dihedral (Intersection Sup.) Representation Systems VIII: Axonometric Projection Representation Systems IX: Cavalier Projection Representation Systems X: Dimensioned Drawings 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.		
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-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
B5 - Ability to have spatial vision and knowledge of mapping techniques, both by traditional methods of metric geometry and descriptive geometry and as computer-aided design applications.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100

5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: BUSINESS		
5.5.1.1 Core Information Level 2		
TYPE	BRANCH	SUBJECT
CORE	Engineering and Architecture	Business
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: 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. STRATEGY AND POLICY BUSINESS BUSINESS CREATION MANAGEMENT TECHNIQUES FINANCIAL MANAGEMENT CORPORATION COMMERCIAL SYSTEM MANAGEMENT PRODUCTION SYSTEM MANAGEMENT HUMAN RESOURCES IN THE COMPANY CORPORATE RISK MANAGEMENT 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		
CC3 - 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.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
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.		
A7 - Ability to analyze and evaluate the social and environmental impact of technical solutions.		
A8 - Ability to apply principles and methods of quality.		
A9 - Ability to organise and planning in the field of business and other institutions and organisation.		

A11 - Knowledge, understanding and ability to apply the necessary legislation in the exercise of the profession of Technical Engineer.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
B6 - Adequate knowledge of the business concept, institutional and legal framework of the company. Organisation and business management		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	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 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: Chemistry		
5.5.1.1.1 Core Information 3		
TYPE	ECTS SUBJECT	DURATION
CORE	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
	6	
ECTS Semester 4	ECTS Semester5	ECTS Semester 6
ECTS Semester7	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 transformation and chemical equilibrium Chemical pollution Electrochemistry Instrumental analysis Fundamentals 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		
CC3 - 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.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		

CC5 - Ability to develop 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.		
A7 - Ability to analyze and evaluate the social and environmental impact of technical solutions.		
A9 - Ability to organise and planning in the field of business and other institutions and .		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
B4 - Ability to understand and apply the principles of basic knowledge of general, organic and inorganic chemistry and their applications in engineering.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
NIVEL 2: COMPUTING		
5.5.1.1 Core Information Level 2		
TYPE	BRANCH	SUBJECT
CORE	Engineering and Architecture	Computer Engineering
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: Fundamentals of Computing		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
CORE	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester2	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 of Operating Systems		
Basic of databases		
Algorithms and Programs		
Introduction to programming in C Language		
Control structures		
Functions		
Structural Data		

Communication systems: Computer and Internet		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC3 - 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.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
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 differential equations; numerical methods; numerical algorithms; statistics and optimization.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
5.5 LEVEL 1: COMMON LEARNING TO INDUSTRIAL BRANCH I		
5.5.1 Core Information Level 1		
LEVEL 2: MATERIALS SCIENCE AND ENGINEERING		

5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	
DURATION: Semester		
ECTS Semester 1	ECTS Semester 2	ECTS Semester3
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: Materials Science		
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 CERAMIC MATERIALS		
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		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop 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.		
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 analyze and evaluate the social and environmental impact of technical solutions.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC		
C3 - Knowledge of the fundamentals of science, technology and chemistry of materials. Understand the relationship between the microstructure, synthesis or processing and properties of materials. Basic knowledge and application of environmental technologies and sustainability.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT

CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	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 and Manufacturing Systems Fundamentals of manufacturing processes Technological aspects of manufacturing processes Environmental implications in manufacturing Sustainable manufacturing Production Systems Automated manufacturing systems Organisation of production Manufacturing Quality Engineering		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
A1 - Ability to write, sign and develop projects in the industrial engineering field which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological branch, construction, alteration, repair, conservation, demolition, manufacture, installation, assembly 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 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 analyze 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-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
C9 - Basic knowledge of production and manufacturing systems. Basic knowledge and application of environmental technologies and sustainability. Applied knowledge of business management.		

5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ACTIVITIES OUTSIDE THE UNIVERSITY (fieldworks, visits to centres/institutions, practices in companies...)		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
5.5 LEVEL 1: COMMON LEARNING TO INDUSTRIAL BRANCH II		
5.5.1 Core Information Level 1		
LEVEL 2: THERMOTECHNICS		
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 SENTENCES		
SPANISH	CATALAN	BASQUE
Yes	No	No
GALICIAN	VALENCIAN	ENGLISH

No	No	No
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	
LEVEL 3: Thermotechnics		
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 Heat pump and refrigeration cycles Non reactive ideal gas mixtures and psychometry Reactive mixtures and combustion General concepts of heat transfer Conduction heat transfer Convective heat transfer Radiation heat transfer Applications at facilities		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		

CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
C1 - Knowledge of applied thermodynamics and heat transfer. Basic principles and their application to solving engineering problems. Basic knowledge and application of environmental technologies and sustainability		
5.5.1.EARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: FLUID MECHANICS		
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: 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 characteristic of fluids		
Kinematic description of the motion of a fluid		
Dimensional analysis concepts and physical resemblance		
Motion at low Reynolds' number and its application in ducts		
Motion at high Reynolds' number		
Laminar and turbulent motions		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		

CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, 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 analyze and evaluate the social and environmental impact of technical solutions		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
C2 - Knowledge of the basic principles of fluid mechanics and their application to solving problems in the field of engineering. Calculating pipes, channels, and fluid systems. Basic knowledge and application of environmental technologies and sustainability.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
5.5 LEVEL 1: COMMON LEARNING TO INDUSTRIAL BRANCH III		
5.5.1 Core Information Level 1		
LEVEL 2: AUTOMATION		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	6	

DURATION: Semester		
ECTS Semester1	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: Automation		
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 AUTOMATION		
INTRODUCTION TO AUTOMATIC CONTROL		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		

CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC3 - 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.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized 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-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
C6 - Knowledge of the basics of automation and control methods.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	0.0
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 THE THEORY OF CIRCUITS		
TECHNICAL ANALYSIS OF CIRCUITS		
THEOREMS AND ADDITIONAL ANALYTICAL TECHNIQUES		
SINE WAVE STEADY STATE		

THREE PHASE SYSTEMS		
ELEMENTS IN ELECTRICAL SYSTEMS		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC3 - 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.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized and non-specialized 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-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
C4 - Knowledge and use of the principles of circuit theory and electrical machines.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices,	0.0	100.0

personal work, follow-up exams.		
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	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		
Linear Circuits Fundamentals of linear circuits. Amplification. Diode. Diode circuits. Bipolar Transistor. (BJT). Transistor circuits. Differential Stages. Operational Amplifiers. O.A. Circuits Logic Circuits. Basics of digital logic. State definition. Logic functions. Boolean Algebra. Logic devices. Logic gates. Combinationals.		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC3 - 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.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized and non-specialized 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-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
C5 - Knowledge of the basics of electronic		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
No data		
5.5.1.7 TEACHING METHODS		
No data		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours	0.0	100.0

minimum - four hours maximum.		
5.5 LEVEL 1: COMMON LEARNING TO INDUSTRIAL BRANCH IV		
5.5.1 Core Information Level 1		
LEVEL 2: STRENGTH OF MATERIALS		
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: 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

THE ELASTIC SOLID

YIELD AND FAILURE CRITERIA

STRENGTH OF MATERIALS. BASIC CONCEPTS

TENSILE AND COMPRESSIVE STRESSES

ELASTIC SIMPLE BENDING

INTRODUCTION TO PLASTICITY. CALCULATION

BENDING AND COMPRESSIVE STRESSES AND DEFLECTION

TORSION OF CIRCULAR SECTIONS

ELASTIC POTENTIAL IN BARS. ENERGY METHODS

PRISMATIC BAR INSTABILITY. BUCKLING

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.

CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.

CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized 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.

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

5.5.1.5.2 CROSS-CURRICULAR COMPETENCES

No data

5.5.1.5.3 SPECIFIC COMPETENCES

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

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100

5.5.1.7 TEACHING METHODS

Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)

Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)

Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: MACHINES AND MECHANISMS		
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: 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 PLANAR MECHANISMS DYNAMIC ANALYSIS OF MECHANISMS BALANCING FLYWHEELS VIBRATIONS		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized 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.		
A7 - Ability to analyze 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-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
C7 - Knowledge of the principles of machines and mechanisms theory		
C8 - Knowledge and use of the principles of strength of materials		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100

5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
5.5 LEVEL 1: COMMON LEARNING TO INDUSTRIAL BRANCH V		
5.5.1 Core Information Level 1		
LEVEL 2: PROJECTS		
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: 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
		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 WORK OF ENGINEERING: THE INDUSTRIAL TECHNICIAN THE TECHNICAL OFFICE AND ITS ORGANISATION. COMPUTER APPLICATIONS TO TECHNICAL OFFICE REVIEWS, VALUATIONS, TECHNICAL REPORTS AND CERTIFICATES INDUSTRIAL PROJECT: OBJECT AND DEFINITION. PHASES. FORMAL PRESENTATION AND STRUCTURE. PROCESSING. PROJECT DOCUMENTS: GENERAL INDEX, MEMORY AND ANNEXES PROJECT DOCUMENTS: PLANES. PROJECT DOCUMENTS: TENDER SPECIFICATIONS. PROJECT DOCUMENTS: STATE OF MEASUREMENTS. PROJECT DOCUMENTS: BUDGET. PROJECT DOCUMENTS: AD HOC STUDIES. CONSTRUCTION MANAGEMENT. INDUSTRIAL FACILITIES REGULATIONS AND THEIR APPLICATIONS.		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
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.		
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-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
C10 - Knowledge and skills to organise and manage projects. Knowledge of the organisational structure and functions of a technical office. Basic knowledge and application of environmental technologies and sustainability. Applied knowledge of business management.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ACTIVITIES OUTSIDE THE UNIVERSITY (fieldworks, visits to centres/institutions, practices in companies...)		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: TECHNICAL DRAWING		
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: Electrical Technical Drawing and Topography		
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 assembly drawing Dimensional and geometric tolerances Standards of detachable joints. Metal structures Electrical Standards. General rules for representing electrical symbols Electrical installations in residential buildings Electrical installations in industrial constructions Connection diagrams and electric power lines in HV and LV Reading and interpretation of construction plans Fundamentals of Topography and Cartography Topographic methods. Topometry Topographic instruments		

Altimetry. Profiles in power line projects

Survey of electricity supply lines

Introduction to global positioning systems

Geographic Information Systems (GIS) applied to Electrical Engineering

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

A1 - Ability to write, sign and develop projects in the industrial engineering field which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological branch, construction, alteration, repair, conservation, demolition, manufacture, installation, assembly 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-CURRICULAR COMPETENCES

No data

5.5.1.5.3 SPECIFIC COMPETENCES

B5 - Ability to have spatial vision and knowledge of mapping techniques, both by traditional methods of metric geometry and descriptive geometry and as computer-aided design applications.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100

5.5.1.7 TEACHING METHODS

Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)

Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)

Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)

SELF STUDY AND PERSONAL WORK

Classroom: ASSESSMENT

5.5.1.8 ASSESSMENT SYSTEMS

ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses,	0.0	100.0

problem solving, laboratory practices, personal work, follow-up exams.		
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
5.5 LEVEL 1: SPECIFIC LEARNING IN ELECTRICAL ENGINEERING I		
5.5.1 Core Information Level 1		
LEVEL 2: ELECTRICAL MACHINES		
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: Electrical Machines 1		
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		
MAGNETIC CIRCUITS GENERAL PRINCIPLES OF ELECTRICAL MACHINES BASIC THEORY OF TRANSFORMER OPERATION OF TRANSFORMERS THREE PHASE TRANSFORMERS SPECIAL AND INSTRUMENT TRANSFORMERS AUTOTRANSFORMERS AND VOLTAGE REGULATION PRINCIPLE AND CONSTITUTION OF ASYNCHRONOUS MOTOR STUDY OF THE TORQUE STARTING AND CHARACTERISTIC CURVES SPEED REGULATION AND SPECIAL APPLICATIONS SINGLE PHASE INDUCTION MOTOR		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop 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.		
A10 - Ability to work in a multilingual and multidisciplinary environment.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
C4 - Knowledge and use of the principles of circuit theory and electrical machines		
E1EE - Ability to calculation and design of electrical machines		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices,	75	0

documents, projects, reports, study...)		
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: ELECTRICAL MACHINES 2		
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: Electrical Machines 2		
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		
FUNDAMENTALS OF DC MACHINES AND THEIR DESIGN ELEMENTS GENERATOR OPERATION OF DC MACHINE MOTOR OPERATION OF DC MACHINE TRANSIENT STATE OF DC MACHINE AC SYNCHRONOUS MACHINE SYNCHRONOUS MACHINE OPERATION AS GENERATOR SYNCHRONOUS MACHINE OPERATION AS MOTOR TRANSIENT STATE OF SYNCHRONOUS MACHINE		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop 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.		
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-CURRICULAR COMPETENCES		

No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
E1EE - Ability to calculation and design of electrical machines.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: CONTROL OF MACHINES AND ELECTRIC DRIVES		
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
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	
LEVEL3: Electric Drives		
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 DC MACHINE REGULATION INDUCTION MOTOR REGULATION SYNCHRONOUS MACHINE REGULATION CONTROL OF STEP MOTORS		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		

A1 - Ability to write, sign and develop projects in the industrial engineering field which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological branch, construction, alteration, repair, conservation, demolition, manufacture, installation, assembly 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.		
A10 - Ability to work in a multilingual and multidisciplinary environment.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
E1EE - Ability to calculation and design of electrical machines.		
E2EE - Knowledge of the control of electrical machines and drives and their applications.		
E3EE - Applied knowledge of power electronics.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEMS	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
5.5 LEVEL 1: SPECIFIC LEARNING IN ELECTRICAL ENGINEERING III		
5.5.1 Core Information Level 1		
LEVEL 2: AUTOMATIC CONTROL		
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: 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		
Modelling and simulation of Dynamic Systems Dynamic system analysis in continuous and discrete time Introduction to control system design		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		

5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC3 - 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.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop 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.		
A10 - Ability to work in a multilingual and multidisciplinary environment.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
T2EE - Knowledge of modelling and analysis of linear system in state space.		
T3EE - Knowledge of design techniques of continuous and discrete time control systems by means of internal description (state variables).		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0

FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: MACHINES AND HEAT ENGINES		
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: Heat Engines		
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 heat engines Steam Turbine Gas Turbine Internal combustion engines (ICE) Distribution Systems. Renewal of charge in ICE Spark Ignition Engines (SIE) Compression Ignition Engines (CIE) Cogeneration with Heat Engines		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC3 - 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.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
A7 - Ability to analyze and evaluate the social and environmental impact of technical solutions.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
T1EE - Knowledge of heat engines. Basic principles and their application as electric power generation elements.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		

ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
5.5 LEVEL 1: SPECIFIC LEARNING IN ELECTRICAL ENGINEERING II		
5.5.1 Core Information Level 1		
LEVEL 2: MEDIUM AND LOW VOLTAGE ELECTRICAL INSTALLATIONS		
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: Medium and Low Voltage Electrical Installations		
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 ELECTRICAL INSTALLATIONS EQUIPMENT: CONDUCTORS. ANOMALOUS CHARGING REGIMES EQUIPMENT: PROTECTION OF INSTALLATIONS EQUIPMENT: CONTACTORS. CONDUITS PEOPLE'S PROTECTION BASIC CIRCUIT CALCULATION PUBLIC LIGHTING INSTALLATIONS POWER FACTOR CORRECTION DESIGN OF LOW VOLTAGE ELECTRICAL INSTALLATIONS DESIGN OF MEDIUM VOLTAGE UNDERGROUND LINES DESIGN OF MEDIUM VOLTAGE INDUSTRIAL INSTALLATIONS TRANSFORMER SUBSTATIONS		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC3 - 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.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process		
A1 - Ability to write, sign and develop projects in the industrial engineering field which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological branch, construction, alteration, repair, conservation, demolition, manufacture, installation, assembly 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..		
A6 - Ability to handle specifications, regulations and mandatory rules.		

A11 - Knowledge, understanding and ability to apply the necessary legislation in the profession exercise of Technical Engineer.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
E5EE - Ability to calculation and design of high voltage electrical installations.		
E6EE - Ability to calculation and design of power lines and electric power transport.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	90	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	112.5	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	22.5	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: ANALYSIS OF ELECTRICAL NETWORKS		
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: 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 STATE TWO-PORT NETWORKS ANALYSIS OF NON-LINEAR ELECTRIC CIRCUITS		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		

CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
C4 - Knowledge and use of the principles of circuit theory and electrical machines		
E4EE - Ability to calculation and design of low and medium voltage electrical installations		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
5.5 LEVEL 1: SPECIFIC LEARNING IN ELECTRICAL ENGINEERING IV		
5.5.1 Core Information Level 1		
LEVEL 2: HIGH VOLTAGE ELECTRICAL NETWORKS		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	9	
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
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: Installations and Power Lines in High Voltage		
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		
HIGH VOLTAGE ELECTRICAL NETWORKS HIGH VOLTAGE OVERHEAD POWER LINES SUBSTATIONS PROTECTIONS		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		

CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC3 - 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.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
A1 - Ability to write, sign and develop projects in the industrial engineering field which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological branch, construction, alteration, repair, conservation, demolition, manufacture, installation, assembly 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..		
A6 - Ability to handle specifications, regulations and mandatory rules.		
A11 - Knowledge, understanding and ability to apply the necessary legislation in the profession exercise of Technical Engineer.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
E5EE - Ability to calculation and design of high voltage electrical installations.		
E6EE - Ability to calculation and design of power lines and electric power transport.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	90	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	112.5	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	22.5	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses,	0.0	100.0

problem solving, laboratory practices, personal work, follow-up exams.		
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: POWER STATIONS		
5.5.1.1 Core Information Level 2		
TYPE	COMPULSORY	
ECTS LEVEL 2	9	
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
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: Power Stations		
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
GALLEGO	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		
PRODUCTION SYSTEMS AND ELECTRICAL ENERGY COVERAGE THERMAL POWER STATIONS. NUCLEAR POWER STATIONS HYDROELECTRIC STATIONS REGULATION AND CONTROL OF POWER STATIONS ANCILLARY SERVICES AND PROTECTIONS IN POWER STATIONS POWER STATIONS WITH RENEWABLE ENERGIES		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC3 - 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.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
A1 - Ability to write, sign and develop projects in the industrial engineering field which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological branch, construction, alteration, repair, conservation, demolition, manufacture, installation, assembly 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.		
A6 - Ability to handle specifications, regulations and mandatory rules.		
A11 - Knowledge, understanding and ability to apply the necessary legislation in the profession exercise of Technical Engineer.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
E9EE - Ability to power station design.		
E10EE - Applied knowledge of renewable energies.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	90	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	112.5	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	22.5	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		

Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
5.5 LEVEL 1: SPECIFIC LEARNING IN ELECTRICAL ENGINEERING V		
5.5.1 Core Information Level 1		
LEVEL 2: ELECTRIC POWER SYSTEMS		
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
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: Analysis of Electrical Energy 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

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		
MODELS AND BASIC CONCEPTS TOPOLOGY AND CHARACTERISTIC MATRIX TRANSMISSION LINES OF ELECTRICAL ENERGY LOAD FLOW FAULTS STABILITY		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
A1 - Ability to write, sign and develop projects in the industrial engineering field which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological branch, construction, alteration, repair, conservation, demolition, manufacture, installation, assembly or operation of: structures, mechanical equipment, energy facilities, electrical and electronic installations, installations and industrial plants and manufacturing-automation processes.		
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-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
E7EE - Knowledge of electric power systems and their applications.		
5.5.1.6 LEARNING ACTIVITIES		

LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEMS	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: OPERATION OF ELECTRICAL ENERGY SYSTEMS		
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
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: Operation of Electrical Energy 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
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		
STATE ESTIMATION ECONOMIC DISPATCH SCHEDULING OF THERMAL POWER STATIONS AUTOMATIC GENERATION CONTROL TRANSPORT NETWORK OPERATION ELECTRIC POWER MARKETS		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
A1 - Ability to write, sign and develop projects in the industrial engineering field which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological branch, construction, alteration, repair, conservation, demolition, manufacture, installation, assembly or operation of: structures, mechanical equipment, energy facilities, electrical and electronic installations, installations and industrial plants and manufacturing-automation processes.		

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-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
E7EE - Knowledge of electric power systems and their applications.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEMS	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
5.5 LEVEL 1: OPTIONAL LEARNING		
5.5.1 Core Information Level 1		
LEVEL 2: APPLIED INDUSTRIAL ELECTRONICS		
5.5.1.1 Core Information Level 2		
TYPE	OPTATIVE	
ECTS LEVEL 2	6	
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
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		
LEVEL 3: Applied Industrial 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: Equipment and electronic systems Electronic equipment design Electronic applications in industrial control Electronic applications in biomedicine Electronic applications in automobiles Other electronic applications		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		

CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop 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.		
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-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
C5 - Knowledge of the basic of electronics.		
E3EE - Applied knowledge of power electronics.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test,	0.0	100.0

two hours minimum - four hours maximum.		
LEVEL 2: ELEMENTS OF ELECTRICAL TECHNOLOGY		
5.5.1.1 Core Information Level 2		
TYPE	OPTATIVE	
ECTS LEVEL2	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	
LIST OF MENTIONS		
No data		
LEVEL 3: Elements of Electrical Technology		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTATIVE	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		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
INTRODUCTION TO ELECTROMAGNETIC INTERFERENCES (E.M.I.) GENERATORS OF ELECTROMAGNETIC INTERFERENCES SOLUTIONS TO ELECTROMAGNETIC INTERFERENCES APPLICATIONS ELECTRICAL PROTECTIONS PROTECTION OF TRANSFORMERS PROTECTION OF GENERATORS PROTECTION OF OTHER ELEMENTS DESIGN OF PANELBOARDS AND ELECTRICAL AUTOMATISMS		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
A1 - Ability to write, sign and develop projects in the industrial engineering field which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological branch, construction, alteration, repair, conservation, demolition, manufacture, installation, assembly 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.		
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 profession exercise of Technical Engineer.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
No data		
5.5.1.6 LEARNING ACITIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices,	75	0

documents, projects, reports, study...)		
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: ELECTRONIC MEASUREMENT EQUIPMENTS		
5.5.1.1 Core Information Level 2		
TYPE	OPTATIVE	
ECTS LEVEL 2	6	
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
	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		
LEVEL 3: Electronic Measurement Equipments		
5.5.1.1.1 Core Information Level 3		

TYPE	ECTS SUBJECT	DURATION
OPTATIVE	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		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
MEASUREMENT SYSTEMS IMPLEMENTATIONS PROGRAMS FOR IMPLEMENTATION BASED ON PC Practice 1: PC environment with management of data acquisition cards Practice 2: PC environment with data acquisition modules in environment		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop 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.		
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-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
No data		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: STRUCTURES		
5.5.1.1 Core Information Level 2		
TYPE	OPTATIVE	
ECTS LEVEL 2	6	
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
	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		
LEVEL 3: Computer-Aided Structural Analysis and Design		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTATIVE	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		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
LOADS ACTING ON STRUCTURES STRUCTURAL REQUIREMENTS STRUCTURAL MATERIALS CABLES AND MEMBRANES RETICULATED STRUCTURAL SYSTEMS LAMINAR STRUCTURAL SYSTEMS PORTICOED STRUCTURAL SYSTEMS MOBILE STRUCTURAL SYSTEMS THE FINITE ELEMENT METHOD (FEM). THEORETICAL BASES SOLVING A PROBLEM BY MEANS OF FEM 1D SYSTEM ANALYSIS 2D SYSTEM ANALYSIS		

3D SYSTEM ANALYSIS		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 BASIC AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
A1 - Ability to write, sign and develop projects in the industrial engineering field which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological branch, construction, alteration, repair, conservation, demolition, manufacture, installation, assembly 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-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
B2 - Understanding and mastering the basic concepts of the general laws of mechanics, thermodynamics, electrical fields, waves, electromagnetism and their application for solving problems of engineering.		
B3 - Basic knowledge on using and programming computers, operating systems, databases and software with applications in engineering.		
C8 - Knowledge and use of the principles of strength of materials.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		

SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: PHYSICS		
5.5.1.1 Core Information Level 2		
TYPE	OPTATIVE	
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	
LIST OF MENTIONS		
No data		
LEVEL 3: Advanced Physics		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTATIVE	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		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Fundamentals of Modern Physics Structure of Matter Properties of Matter Optics and Acoustics		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop 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.		
A10 - Ability to work in a multilingual and multidisciplinary environment.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
OEE26 - Knowledge of technological applications that have been developed from contemporary physics principles.		
OEE27 - Ability to design and improve technological devices through the knowledge of their operating physical laws.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100

E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: ELECTRICAL GENERATION WITH RENEWABLE ENERGIES		
5.5.1.1 Core Information Level 2		
TYPE	OPTATIVE	
ECTS LEVEL 2	6	
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
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		
LEVEL 3: Electrical generation with renewable energies		

5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTATIVE	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		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
GENERAL INTRODUCTION DISTRIBUTED GENERATION IN ELECTRICAL ENERGY SYSTEMS ELECTRICITY GENERATION WITH SOLAR THERMAL ENERGY AND PHOTOVOLTAIC CALCULATION AND DESIGN OF SOLAR THERMAL POWER STATIONS AND PHOTOVOLTAIC ELECTRICITY GENERATION WITH WIND POWER CALCULATION AND DESIGN OF WIND POWER STATIONS ELECTRICITY GENERATION WITH GEOTHERMAL ENERGY TECHNICAL REGULATIONS IN RENEWABLE ENERGIES		
5.5.1.4 OBSERVATION		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
A1 - Ability to write, sign and develop projects in the industrial engineering field which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological branch, construction, alteration, repair, conservation,		

demolition, manufacture, installation, assembly 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.		
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 profession exercise of Technical Engineer.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
E9EE - Ability to power station design.		
E10EE - Applied knowledge of renewable energies		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: COMPUTING		
5.5.1.1 Core Information Level 2		

TYPE		OPTATIVE	
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		
LIST OF MENTIONS			
No data			
LEVEL 3: Computing Systems			
5.5.1.1.1 Core Information Level 3			
TYPE	ECTS SUBJECT	DURATION	
OPTATIVE	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			
5.5.1.2 LEARNING RESULTS			
5.5.1.3 CONTENTS			
Databases			

Scientific programming using Matlab		
Visual programming oriented to events		
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-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
OEE22 - Knowledge and ability to apply database knowledge.		
OEE23 - Basic knowledge of computer systems and programming aimed at industrial applications.		
OEE24 - Ability to apply knowledge of mathematics, science and engineering to implement algorithms in a programming language.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: AUTOMATION		
5.5.1.1 Core Information Level 2		

TYPE	OPTATIVE	
ECTS LEVEL 2	6	
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
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		
LEVEL 3: Control Engineering		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTATIVE	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		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
System modelling with state variables		

Properties of internal representation of processes		
Linear feedback of the state vector		
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.		
A10 - Ability to work in a multilingual and multidisciplinary environment.		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
No data		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices,	0.0	100.0

personal work, follow-up exams.		
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: MECHANICAL ENGINEERING		
5.5.1.1 Core Information Level 2		
TYPE	OPTATIVE	
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	
LIST OF MENTIONS		
No data		
LEVEL 3: Industrial Maintenance		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTATIVE	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			
5.5.1.2 LEARNING RESULTS			
5.5.1.3 CONTENTS			
THE INDUSTRIAL MAINTENANCE. GENERALITIES TYPES OF MAINTENANCE LUBRICATION AND MAINTENANCE PREVENTIVE AND PREDICTIVE MAINTENANCE TECHNIQUES FAILURE STUDY ORGANISATION OF MAINTENANCE IN INDUSTRY			
5.5.1.4 OBSERVATIONS			
5.5.1.5 COMPETENCES			
5.5.1.5.1 CORE AND GENERAL COMPETENCES			
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.			
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising sustaining arguments and solving problems within their field of study.			
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.			
CC5 - Ability to develop 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.			
A6 - Ability to handle specifications, regulations and mandatory rules.			
A9 - Ability to organise and planning in the field of business and other institutions and organisations.			
A10 - Ability to work in a multilingual and a multidisciplinary environment.			
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES			
No data			
5.5.1.5.3 SPECIFIC COMPETENCES			
B3 - Basic knowledge on using and programming computers, operating systems, databases and software with applications in engineering.			
C4 - Knowledge and use of the principles of circuit theory and electrical machines.			
C7 - Knowledge of the principles of machines and mechanism theory			
C8 - Knowledge and use of the principles of strength of materials.			
5.5.1.6 LEARNING ACTIVITIES			
LEARNING ACTIVITY	HOURS	PRESENTIALITY	
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100	
E-LEARNING ACTIVITIES (presentations, practices,	75	0	

documents, projects, reports, study...)		
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ACTIVITIES OUTSIDE THE UNIVERSITY (fieldworks, visits to centres/institutions, practices in companies...)		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: ENGLISH		
5.5.1.1 Core Information Level 2		
TYPE	OPTATIVE	
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
No	No	No
GALICIAN	VALENCIAN	ENGLISH
No	No	Yes
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	
LIST OF MENTIONS		
No data		

LEVEL 3: English Applied to Electrical Engineering		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTATIVE	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
No	No	No
GALICIAN	VALENCIAN	ENGLISH
No	No	Yes
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	
LIST OF MENTIONS		
No data		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Nominal groups. Extensive reading: Chemistry principles: Atoms and molecules. Expression Verb tenses. Extensive reading: Ohm's Law. Speaking: Micro text Relative clauses. Extensive reading: Kirchhoff's Laws. Speaking: Micro text Expressing logical relations. Writing: Text organisation. Speaking: Micro text Expressing suasion and intellectual attitudes. Writing: Writing from sketches. Speaking: Micro text Giving factual information. Writing: C. V., application letter. Speaking: Micro text Scientific symbols, signs and expressions. Writing: Reports and abstracts. Speaking:		
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-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
No data		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100

E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: ELECTRICAL MEASUREMENTS		
5.5.1.1 Core Information Level 2		
TYPE	OPTATIVE	
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	
LIST OF MENTIONS		
No data		
LEVEL 3: Electrical Measurements		

5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTATIVE	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
	5	
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		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
BASIC ASPECTS OF MEASUREMENTS ERRORS IN MEASUREMENTS ELECTRICAL SAFETY IN THE ELECTRICAL MEASUREMENT FIELD MEASURING INSTRUMENTS: ANALOG AND DIGITAL EXTENSION OF THE MEASURING RANGE EFFECTS ON THE RESULT OF THE MEASUREMENT DUE TO MEASURING INSTRUMENTS DEFINITIONS OF WAVE QUALITY POWER MEASUREMENTS ENERGY MEASUREMENTS MEASUREMENT INDICES OF WAVE QUALITY MONITORING AND ANALYSIS OF ELECTRICAL NETWORK PARAMETERS ELECTRICAL MEASUREMENT AUTOMATION		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising sustaining arguments and solving problems within their field of study.		

CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
A1 - Ability to write, sign and develop projects in the industrial engineering field which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological branch, construction, alteration, repair, conservation, demolition, manufacture, installation, assembly 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.		
A6 - Ability to handle specifications, regulations and mandatory rules.		
A10 - Ability to work in a multilingual and a multidisciplinary environment.		
A11 - Knowledge, understanding and ability to apply the necessary legislation in the profession exercise of Technical Engineer.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
OEE30 - To know typical terminology, symbology and regulations associated to the electrical measurement field.		
OEE31 - To control different measurement methods and skills, selecting the most suitable for each moment.		
OEE32 - Knowledge of the basics of electrical safety associated to carrying out the measure, at both the laboratory and the industry.		
OEE33 - To be able to estimate the accuracy and the uncertainty of the measurement made.		
OEE34 - To be able to handle measurement devices (electrical and electronic) needed to make the appropriate measurements for the moment required.		
OEE35 - To know disturbance problems in electric power systems.		
OEE36 - To know the wave quality measure in power systems.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		

5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: BUSINESS ORGANISATION		
5.5.1.1 Core Information Level 2		
TYPE	OPTATIVE	
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	
LIST OF MENTIONS		
No data		
LEVEL 3: Operations Management		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTATIVE	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		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
FUNCTIONS OF OPERATIONS MANAGEMENT LOCATION OF FACILITIES DESIGN, CAPACITY AND DISTRIBUTION OF FACILITIES PROCESS PLANNING AND ANALYSIS DESIGN AND WORK MEASUREMENT TOTAL PLANNING AND MASTER SCHEDULING MATERIALS MANAGEMENT: BUY AND ACQUISITION OF INVENTORIES INVENTORY CONTROL MATERIAL REQUIREMENTS PLANNING SCHEDULING AND CONTROL OF PRODUCTION ACTIVITIES PROJECT MANAGEMENT QUALITY CONTROL		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		
5.5.1.5.1 CORE AND GENERAL COMPETENCES		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising sustaining arguments and solving problems within their field of study.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
OEE17 - Knowledge, understanding and ability to design and manage production systems and industrial operations.		
OEE18 - Basic knowledge and application of environmental technologies and sustainability.		
OEE19 - Applied knowledge of Business Organisation in Industrial Operations.		
OEE21 - Ability to programming and integration of industrial manipulators in automated cells.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY

LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING AS- SESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: AUTOMATION		
5.5.1.1 Core Information Level 2		
TYPE	OPTATIVE	
ECTS LEVEL 2	6	
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
	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		
LEVEL 3: Industrial Robots Programming		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTATIVE	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		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Introduction to robotics Morphology and characteristics Direct kinematic model Representation of the position and orientation Denavit and Hartenberg methodology Inverse kinematic model Solving methodologies Robot programming languages Levels of programming Specific programming languages Programming of industrial robots Application Types of applications Design and programming of applications Industrial robots Implementation Robots Integration Safety		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCES		

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.

CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising sustaining arguments and solving problems within their field of study.

CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.

CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.

A1 - Ability to write, sign and develop projects in the industrial engineering field which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological branch, construction, alteration, repair, conservation, demolition, manufacture, installation, assembly 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 a multidisciplinary environment.

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

5.5.1.5.2 CROSS-CURRICULAR COMPETENCES

No data

5.5.1.5.3 SPECIFIC COMPETENCES

No data

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100

5.5.1.7 TEACHING METHODS

Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)

Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)

Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)

SELF STUDY AND PERSONAL WORK

Classroom: ASSESSMENT

5.5.1.8 ASSESSMENT SYSTEMS

ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses,	0.0	100.0

problem solving, laboratory practices, personal work, follow-up exams.		
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: SAFETY AND HYGIENE		
5.5.1.1 Core Information Level 2		
TYPE	OPTATIVE	
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	
LIST OF MENTIONS		
No data		
LEVEL 3: Occupational Health and Safety		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTATIVE	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	
5.5.1.2 LEARNING RESULTS	
5.5.1.3 CONTENTS	
Concepts of Health and Illness. Determining factors of Occupational Health Fundamentals and related health and safety concepts: accident and occupational disease Risk assessment: analysis, evaluation and control of specific risks Individual and collective protection Introduction to occupational health: assessment and risk valuation of hygiene Basics of working toxicology Chemical, physical and biological agents Introduction to ergonomics: analysis of working conditions Basic concepts on work physiology Occupational Biomechanics. Disorders of the musculoskeletal system Physical workload Methods for evaluating physical workload Mental workload: Psychosocial risks at work: Concept Notions of occupational epidemiology Legislation and Work Health Management of preventive activity Basics of first aid	
5.5.1.4 OBSERVATIONS	
5.5.1.5 COMPETENCES	
5.5.1.5.1 CORE AND GENERAL COMPETENCES	
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.	
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES	
No data	
5.5.1.5.3 SPECIFIC COMPETENCES	
OEE3 - Ability to apply the principles of the Health and Safety at Work, techniques for assessing the risks of accidents, measures and adequate means for its prevention.	
OEE4 - Students should know the means of collective and individual protection.	
OEE5 - To understand the significance and need for safe working conditions.	
OEE6 - To know the responsibilities of the occurrence of accidents, features and methods in solving labor disputes.	
OEE7 - To know in detail the basics of Safety Inspection and Accident Investigation. Methodology and implementation.	
E8EE - Knowledge of the principles of automatic control and their applications to industrial automation.	
OEE9 - To understand and know the risk assessment of a company and its preventive measures.	
OEE10 - To know how to calculate and interpret statistical indices of most common accidents and perform critically an evaluation of them.	

OEE11 - To know the basics of scientific documentation and information sources in industrial hygiene. Knowledge of the fundamentals of the investigation of occupational diseases.		
OEE12 - To know the main hygiene, physical, chemical and biological risks.		
OEE13 - To know the pollutants in hospitals and the mechanisms of evolution, control and their prevention.		
OEE14 - To know the basics of Ergonomics, objectives, branches, and its usefulness in prevention.		
OEE15 - To be able to collaborate with the preventive planning of a company and know aspects related to the promotion of health at work.		
OEE16 - Basic knowledge of first aid at company level.		
OEE17 - Knowledge, understanding and ability to design and manage production systems and industrial operations.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	60	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	75	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	15	100
5.5.1.7 TEACHING METHODS		
Classroom: EXPOSITIVE ACTIVITIES (Masterclass, conference, expositions...)		
Classroom: PRACTICE ACTIVITIES IN CLASSROOM (Problem solving, design activities, simulation, reports, bibliographic revision...)		
Classroom: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (Laboratory practices, practices in computer rooms, in language classrooms, in audiovisual classrooms...)		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.	0.0	100.0
LEVEL 2: LIGHTING TECHNIQUES AND DOMOTICS		
5.5.1.1 Core Information Level 2		
TYPE	OPTATIVE	
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	
LIST OF MENTIONS		
No data		
LEVEL 3: Lighting Techniques and Domotics		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTATIVE	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		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
BASIC FACTORS IN LIGHTING		
UNITS AND MAGNITUDES USED IN LIGHTING		
GRAPHICS AND DIAGRAMS OF LIGHTING		
REFLECTION, ABSORPTION AND LIGHT TRANSMISSION		
TECHNOLOGICAL ASPECTS ON INCANDESCENT LAMPS		
DISCHARGE LAMPS		
INDOOR LIGHTING PROJECT		

OUTDOOR LIGHTING PROJECT

PRINCIPLES OF PUBLIC LIGHTING

BASIC CONSIDERATIONS IN THE CALCULATION OF PUBLIC LIGHTING

POWER AND CONTROL OF LIGHTING FACILITIES

GENERAL INTRODUCTION TO DOMOTICS

FEATURES OF DOMOTIC MARKET

USER REQUIREMENTS

SETTING OF A DOMOTIC SYSTEM

APPLICATIONS OF DOMOTICS

BUILDING CONDITIONING FOR DOMOTIC BUILDINGS

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCES

5.5.1.5.1 CORE AND GENERAL COMPETENCES

CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.

CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising sustaining arguments and solving problems within their field of study.

CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.

CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULAR COMPETENCES

No data

5.5.1.5.3 SPECIFIC COMPETENCES

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

E4EE - Ability to calculation and design of low and medium voltage electrical installations.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
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No data

5.5.1.7 TEACHING METHODS

No data

5.5.1.8 ASSESSMENT SYSTEMS

ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
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CONTINUOUS OR TRAINING ASSESSMENT (between 0% and 100% out of grades): Masterclasses, problem solving, laboratory practices, personal work, follow-up exams.

0.0

100.0

FINAL EXAM (between 20% and 80% out of grades): In class test, two hours minimum - four hours maximum.

0.0

100.0

5.5 LEVEL 1: DEGREE FINAL PROJECT

5.5.1 Core Information Level 1

LEVEL 2: Degree Final Project

5.5.1.1 Core Information Level 2		
TYPE	DEGREE FINAL 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	
NOT APPEAR LEVEL 3 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		
CC1 - Ability to prove, recall and understand the knowledge in a field of study that is supposed to be acquired from the general secondary education, including some aspects which imply knowledge of the state of the art area of study.		
CC2 - Know how to apply their knowledge to their work or vocation in a professional way and have the competences typically proved through devising, sustaining arguments and solving problems within their field of study.		
CC3 - 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.		
CC4 - Ability to communicate information, ideas, problems and solutions to either specialized or non-specialized audiences.		
CC5 - Ability to develop those learning skills necessary to undertake further studies with a high autonomous learning process.		
5.5.1.5.2 CROSS-CURRICULAR COMPETENCES		
No data		
5.5.1.5.3 SPECIFIC COMPETENCES		
DFP - Exercise to be performed individually and present and defend in front of an examination board, this is a project in the field of specific technologies of Industrial Engineering of professional nature in which synthesize and integrate the competences/ skills acquired in the degree teachings.		
5.5.1.6 LEARNING ACTIVITIES		

LEARNING ACTIVITY	HOURS	PRESENTIALITY
LEARNING ACTIVITIES IN CLASS (Masterclass, classroom practices, laboratory practices...)	4	100
E-LEARNING ACTIVITIES (presentations, practices, documents, projects, reports, study...)	295	0
ASSESSMENT (partial exam, final exam, questionnaire, project, report...)	1	100
5.5.1.7 TEACHING METHODS		
Classroom: TUTORING		
SELF STUDY AND PERSONAL WORK		
Classroom: ASSESSMENT ACTIVITIES (DEFENSE OF THE DEGREE FINAL PROJECT)		
5.5.1.8 ASSESSMENT SYSTEMS		
ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
DEFENSE OF THE DEGREE FINAL PROJECT IN FRONT OF AN EXAMINING BOARD.	0.0	100.0

6. ACADEMIC PERSONNEL

6.1 LECTURES AND OTHER HUMAN RESOURCES				
University	Category	Total %	Doctors %	Hours %
University of Malaga	Professor at the University	1.97	100.0	25.0
University of Malaga	Professor at the University	6.4	100.0	25.0
University of Malaga	Assistant Lecturer	27.1	100.0	25.0
University of Malaga	Assistant Lecturer	23.65	0.0	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	Professor hired by a Doctor	8.87	100.0	25.0
University of Malaga	Associate Professor (includes associated professor of Health Sciences)	20.2	0.0	25.0
University of Malaga	Associate Professor	3.94	0.0	25.0
University of Malaga	Other teaching Personnel with Employment contract	3.44	0.0	25.0
ACADEMIC PERSONNEL				
See annexes. Section 6.				
6.2 OTHER HUMAN RESOURCES				
See annexes. Section 6.2				

7. MATERIAL RESOURCES AND SERVICES

Vindication the available material resources are adequate: See annexes, section 7.

8. EXPECTED RESULTS

8.1 QUANTITATIVE VALUES ESTIMATION		
GRADUATION RATE %	DROPOUT RATE %	EFFICIENCY RATE %
12	30	60
CODE	RATE	VALUE %
No data		
Vindication of proposed indicators:		
See appendices, section 8.		
8.2 GENERAL PROCEDURE FOR ASSESSING 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 is contemplated in Article 134 of the Statutes of the University, approved by Decree of the Andalusian Regional Government, number 145/2003, 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, will approve the academic schedule of the teaching which belongs to the official degrees taught in the Centre. This programme should include the Syllabus of each of the relevant subjects, and this will incorporate the evaluation system of the student academic performance, setting the type of tests, their number, the criteria to correct and the components which should be considered for the student final grade. The aforementioned evaluation system should take into account the provisions of article 124 of the quoted Statutes, which establishes the students have right to do two ordinary exams per academic year.		

In addition to the aforementioned procedure, consequence of the current legal regime in the matter, 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 Andalusian 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 processes and an opportunity for its reformulation and improvement.

It is necessary to widen the concept of performance assessment to cover the various components of personal and professional competences that aims to develop university education: knowledge, skills, attitudes and behaviors.

The central aim of the evaluation model proposed by the University of Malaga is that the student is aware at all times of their learning process, understand what they learn, know how 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 that guide the proposed model framework rely 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/repository/fileDownloader?rfname=10c53ede-27eb-4846-b3fb-ce90cbd42082.pdf
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10. IMPLEMENTATION CALENDAR

10.1 IMPLEMENTATION TIMELINE

COURSE ENTRY	2010
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See annex, section 10.

10.2 ADAPTATION PROCEDURE

REGULATION RULES OF THE ADAPTATION SYSTEM OF THE DEGREE FOR STUDENTS WHO STUDY DEGREES WHICH WILL BE EXTINGUISHED.

Article 1. Field of application.

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

Article 2. Adaptation procedure.

- 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 seat through the pre-enrollment procedure.
- The administrative procedure for executing the adaptation referred by the previous paragraph shall start upon request, addressed to the Dean of the Centre of the University of Malaga during the corresponding official period for student enrollments.
- The aforementioned adaptation shall entail the right to formalise the enrollment as a student of the respective official degree, without the need to request for the seat through the pre-enrollment process, not either obtain recognition of credits, in accordance with the provisions of the "regulatory standards of the recognition of studies or activities, and working or professional experience, in order to obtain official university Degrees and Masters, as well as the transfer credits" approved by the Governing Council of the University of Malaga, June 23rd, 2011.

Article 3. Expiration Procedures of Syllabus.

- The expiration of the Syllabus, corresponding to the degrees referred by the article 1 of the current rules, will be performed temporarily, year by year, starting from the academic year in which the respective Degree is implemented, but in any case should exceed the date of September 30th, 2015.
- After each course has been extinguished, six calls to examination of the corresponding subjects will be made within three academic years, which will be opened to students who may apply the current rules and who are enrolled in these subjects in the academic year. This possibility also affects students who have not previously studied the corresponding subjects, provided the respective Assessment System permits it.
- Students, who exhaust all calls indicated in the previous paragraph without having passed the respective subjects, should be adapted to the corresponding official Degree, in the same conditions as indicated in article 2 of the current rules.

TABLE OF ADAPTATION

Technical Industrial Engineer. Speciality in Electricity	Graduate in Electrical Engineering from the University of Malaga
Algebra	Linear Algebra
Calculus	Calculus
Statistical Methods	Vector and Statistical Analysis
Physical Fundamentals of Electrical Engineering	Physics 1
Fundamentals of Computing	Fundamentals of Computing
Chemistry applied to Electrical Engineering	Chemistry
Technical Drawing and Computer Aided Design	Technical Drawing in Engineering
Business Management and Production Organisation	Business Management
Thermal and Fluid Machines	Fluid Mechanics
Electrical and Magnetic Materials	Materials Science
Circuits	Fundamentals of Electrical Engineering
Industrial Electronics	Fundamentals of Electronics
Automatic Control	Automation
Theory of Mechanisms and Structures	Theory of Machines
Foundations and Structures of Electrical Installations	Strength of Materials
Technical Office	Technical Office

Electrical Machines I	Electrical Machines I
Auxiliary Elements of Electrical Machines	Electric Drives
Electrical Installations	Medium and Low Voltage Electrical Installations
Electric Power Transport	Installations and Power Lines in High Voltage
Electric Power Systems	Analysis of Electrical Energy Systems
Industrial Automation Systems	Automatic Control
Industrial Process Control	Automatic Control
Power Stations	Power Stations
Engineering Drawing and Topography	Electrical Technical Drawing and Topography
Analysis of Electrical Network	Analysis of Electrical Network
Electrical Machines II	Electrical Machines II
Alternative Energies	Electrical Generation with Renewable Energies
Electrometry	Electrical Measurements
Fundamentals of Electrotechnics	Physics 2
Industrial Electronic Laboratory	Applied Industrial Electronics
Electronic Measurement Equipment	Electronic Measurement Equipments
Electronic Measurement Equipment Laboratory	Electronic Measurement Equipments
Technical English I	English applied to Electrical Engineering
Occupational Hygiene And Safety	Occupational Health and Safety
Algorithm Design	Computing Systems
Quality Management, Planning and Control	Operations Management
Industrial Automation Systems	Industrial Robots Programming
Industrial Process Control	Industrial Robots Programming
Experimental Techniques in Electrotechnics	Elements of Electrical Technology
Advanced Physics of Electrical Engineering	Advanced Physics
Thermodynamics	Thermotechnics

10.3 STUDIES BEING PHASES OUT

CODE	STUDY - CENTRE
5098000-29009119	Technical Industrial Engineering, speciality in Electricity - Higher Polytechnic School

11. PERSONS ASSOCIATED WITH THE APPLICATION

11.1 RESPONSIBLE FOR DEGREE			
Identity Card	NAME	LAST NAME 1	LAST NAME 2
33381949W	ALEJANDRO	RODRIGUEZ	GOMEZ
ADDRESS	POSTAL CODE	PROVINCE	CITY
C/ RIO ROCIO 2-4-8	29002	Malaga	Malaga
EMAIL	PHONE	FAX	POSITION
director.eps@uma.es	670947044	951952310	Dean of Higher Polytechnic School at the University of Malaga

11.2 LEGAL REPRESENTATIVE			
Identity Card	NAME	LAST NAME 1	LAST NAME 2
25084614D	Maria José	Blanca	Mena
ADDRESS	POSTAL CODE	PROVINCE	CITY
Plaza El Ejido s/n PABELLON DE GOBIERNO DE LA UNIVERSIDAD DE MALAGA	29071	Malaga	Malaga
EMAIL	PHONE	FAX	POSITION
blamen@uma.es	952131038	952132694	Vice-Rector for Teaching and Academic Planning

11.3 APPLICANT
Responsible for degree is not the applicant

Identity Card	NAME	LAST NAME 1	LAST NAME 2
25084614D	MARIA JOSE	BLANCA	MENA
ADDRESS	POSTAL CODE	PROVINCE	CITY
PLAZA EL EJIDO S/N - PABELLON DE GOBIERNO DE LA UNIVERSIDAD DE MALAGA	29071	Malaga	Malaga
EMAIL	PHONE	FAX	POSITION
blamen@uma.es	952131038	952132694	VICE-RECTOR FOR TEACH- ING AND ACADEMIC PLANNING

ANNEXES: SECTION 2

Name: 2. JUSTIFICA INGENIERIA ELECTRICA.pdf

HASH MD5: 7876606e61a626c8913ac50a59deade8

Size: 310190

2. JUSTIFICA INGENIERIA ELECTRICA.pdf

ANNEXES: SECTION 3

Name: 4.1. SISTEMA DE INFORMACIÓN PREVIO.pdf

HASH MD5: 0171987de8a5c80fef3f176ee0cf91a2

Size: 34331

4.1. SISTEMA DE INFORMACIÓN PREVIO.pdf

ANNEXES: SECTION 5

Name: APARTADO_5.1._PLAN ESTUDIOS_INGENIERIA_ELECTRICA.pdf

HASH MD5: b9e82fc565ba9c8bb6f4c1cf0a6dd49b

Size: 36967

APARTADO_5.1._PLAN ESTUDIOS_INGENIERIA_ELECTRICA.pdf

ANNEXES: SECTION 6

Name: 6. RRH PDI.pdf

HASH MD5: a066af50f12f745107140dc5718ceaff

Size: 92226

6. RRH PDI.pdf

ANNEXES: SECTION 6.2

Name: 6.2. OTROS RRHH.pdf

HASH MD5: 189a5de1fd1e34ca9f3396557d8bd0da

Size: 33060

6.2. OTROS RRHH.pdf

ANNEXES: SECTION 7

Name: APARTADO_7_RECursos MATERIALES.pdf

HASH MD5: 13f97a03f4b837943b7678f2d8d63f9a

Size: 295336

APARTADO_7_RECursos MATERIALES.pdf

ANNEXES: SECTION 8

Name: 8. ING ELECTRICA. JUSTIFICA TASAS.pdf

HASH MD5: 55a8a3a507fc464ab8d5578735203359

Size: 35594

8. ING ELECTRICA. JUSTIFICA TASAS.pdf

ANNEXES: SECTION 10

Name: 10.1. CRONOGRAMA DE IMPLANTACION.pdf

HASH MD5: 5a338529bd234560267088ac565c5f7b

Size: 18520

10.1. CRONOGRAMA DE IMPLANTACION.pdf

ANNEXES: SECTION 11

Name: DELEGACION FIRMA _ [Maria Jose Blanca Mena].pdf

HASH MD5: 150faeaf4e41e73aba064cae30be88ec

Size: 114367

DELEGACION FIRMA _ [Maria Jose Blanca Mena].pdf

