APPLICATION FORM FOR VERIFICATION OF OFFICIAL DEGREES

1. UNIVERSITY, CENTER 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 Málaga	Higher Polytechnic School	29009119
LEVEL	**SHORT DESIGNATION**	
Degree	Mechanical Engineering	
SPECIFIC DENOMINATION		
Graduated in Mechanical Engineering by the University of Malaga		
BRANCH OF KNOWLEDGE		
Engineering and Architecture		
ASSOCIATED UNIVERSITIES	AGREEMENT	
No		
ENABLING TO EXERCISTE A REGULATED PROFESSION	ENABLING RULES	
Yes	Orden CIN/351/2009, de 9 de febrero, BOE de 20 febrero de 2009	
APPLICANT		
NAME AND SURNAME	POSITION	
MARIA JOSE BLANCA MENA	Vice- Rector for Academic Affairs at University of Malaga	
Type of Document	Document number	
IDENTITY CARD	25084614D	
LEGAL REPRESENTATIVE		
NAME AND SURNAME	POSITION	
MARIA JOSE BLANCA MENA	Vice- Rector for Academic Affairs at University of Malaga	
Type of Document	Document number	
NIF	25084614D	
RESPONSIBLE FOR THE DEGREE		
NAME AND SURNAME	POSITION	
Alejandro Rodríguez Gómez	DEAN HIGHER POLYTECHNIC SCHOOL	
Type of Document	Document number	
NIF	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	TOWNSHIP/CITY	TELEPHONE
C/ El Ejido s/n. PABELLÓN DE GOBIERNO DE LA UNIVERSIDAD DE MÁLAGA	29071	Málaga	952131038
E-MAIL	PROVINCE		FAX
blamen@uma.es	Málaga		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 de 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
Degree	Graduated in Mechanical Engineering at the University of Malaga	No		See annexes. Paragraph 1.

MENTIONS LIST
No data

BRANCH	ISCED 1	ISCED 2
Engineering and Architecture	Engineering and related professions	Mechanics and Metallurgy

ENABLING FOR REGULATED PROFESSION:	Technical Industrial Engineer

RESOLUTION	Resolution of January 15, 2009, BOE January 29, 2009
NORM	Orden CIN/351/2009, of February 9, BOE 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 Málaga

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	REQUIRED CREDITS	WORKING CREDITS ENDING DEGREE/ MASTER
30	138	12

LIST OF MENTIONS	
MENTION	OPTIONAL CREDITS
No data	

1.3. University of Malaga

1.3.1. CENTERS IN WHICH OFFERED

LIST OF CENTERS	
CODE	CENTER
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 CENTER		
IN-PERSON CLASS	BLENDED LEARNING	ON-LINE
Yes	No	No
NEW OFFERED SEATS		
FIRST YEAR OF IMPLEMENTATION	SECOND YEAR OF IMPLEMENTATION	THIRD YEAR OF IMPLEMENTATION

200	200	200
FOURTH YEAR OF IMPLEMENTATION	FULL TIME	
200	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	Yes
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	

2. JUSTIFICATION, ADEQUACY FOR PROPOSAL AND PROCEDURES

See anexess, paragraph 2.

3. COMPETENCIES

3.1 CORE AND GENERAL COMPETENCIES
CORE
CC1[8] – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
GENERAL
A1 – Ability to write, sign and develop projects in the field of industrial engineering which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energy facilities, electrical and electronic installations, installations and industrial plants and manufacturing-automation processes.
A2 – Ability for the management of the activities of engineering projects described in the previous section.
A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.
A5 – Knowledge to perform measurements, calculations, assessments, appraisals, expert calculations, studies, reports, work plans and similar work.
A6 – Ability to handle specifications, regulations and mandatory rules.
A7 – Ability to analyze and evaluate the social and environmental impact of technical solutions.
A8 – Ability to apply principles and methods of quality.
A9 – Ability to organize and planning in the field of business and other institutions and organizations.
A10 – Ability to work in a multilingual and multidisciplinary environment.
A11 – Knowledge, understanding and ability to apply the necessary legislation in the exercise of the profession of Engineer.
3.2 CROSS-CURRICULAR COMPETENCIES
No data
3.3 SPECIFIC COMPETENCIES
B1 – Ability to solve mathematical problems that may arise in engineering. Ability to apply knowledge of linear algebra; geometry; differential and integral calculus; differential and partial derivatives equations; numerical methods; numerical algorithms; statistics and optimization.
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 chemistry, organic/inorganic chemistry and their applications in engineering.

[8] "CC" means "Core Competencies": "CB", in Spanish.

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 concept of business, institutional and legal framework of the company. Organization and business management.
C1 – Knowledge of applied thermodynamics and heat transfer. Basic principles and their applications to solving engineering problems.
C2 – Knowledge of the basic principles of fluid mechanics and their application to solving problems in the field of engineering. Calculating pipes, channels and fluid systems.
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.
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 resistance of materials.
C9 – Basic knowledge of production and manufacturing systems.
C10 – Basic knowledge and application of environmental technologies and sustainability.
C11 – Applied knowledge of business management.
C12 – Knowledge and skills to organize and manage projects.
C13 – Knowledge of the organizational structure and functions of a project office.
E1IM – Knowledge and skills to apply the techniques of graphic engineering.
E2IM – Knowledge and skills for calculation, design and testing machines.
E3IM – Applied knowledge of thermal engineering.
E4IM – Knowledge and skills to apply the fundaments of elasticity and resistance of materials to the behaviour of real solids.
E5IM – Knowledge and ability to analysis and design of structures and industrial buildings.
E6IM – Applied knowledge of the fundamentals of systems and mechanical fluid machines.
E7IM – Knowledge and skills in the application of materials engineering.
E8IM – Applied knowledge of systems and manufacturing processes, metrology and quality control.
T1IM – Knowledge of heat engines. Basic principles and their applications as elements of mechanical energy generation.
T2IM – Knowledge of auxiliary systems of ICE[9].
T3IM – Additional knowledge of metrology, calibration and accreditation.
T4IM – Ability to implement systems in manufacturing, advanced techniques of quality control and normalization.
T5IM – Knowledge and skills to tackle the design, calculation and execution of structures.
T6IM – Knowledge and skills for the application of materials engineering.
T7IM – Knowledge and skills for the use of experimental techniques and simulation tools of machine design.
T8IM - Knowledge and skills to tackle the design, calculation and execution of concrete structures.
OIM1 – Knowledge and skills to apply the methods of soil mechanics.
OIM2 – Knowledge and skills for the design, calculation and executions of foundations of structures.
OMI3 – Knowledge of renewable energy and energy efficiency.
OMI4 – Scientific and technological knowledge on welding procedures, metallurgical aspects, inspection and calculation of welded joints.
OIM5 – Knowledge and ability to understand the theoretical behaviour of materials used in construction.
OIM6 – Application of building materials and construction elements.

[9] ICE: Internal Combustion Engine. In Spanish, MCIA: Motor de Combustión Interna Alternativa.

OIM7 - Ability to apply the principles of the health and safety at Work, techniques for assessing the risks of accidents, measures and adequate means for their prevention.
OIM8 - To know the means of collective and individual protection.
OIM9 - To understand the significance and need for safe working conditions.
OIM10 - To know the responsibilities of the occurrence of accidents, features and methods in solving working disputes.
OIM11 - To know in detail the basics of safety inspection and accident investigation. Methodology and implementation. .
OIM12 - To know the different types of reporting accidents.
OIM13 – To understand the risk assessment of a company and its preventive measures.
OIM14 – To know how to calculate and interpret statistical indices of most common accidents and perform critically an evaluation of them.
OIM15 - To know the basics of scientific documentation and information sources in industrial hygiene. Knowledge of the fundamentals of the research of occupational diseases.
OIM16 - To know the main hygiene, physical, chemical and biological risks.
OIM17 - To know the pollutants in hospitals and the mechanisms of evolution, control and their prevention.
OIM18 - To know the basics of ergonomics, objectives, branches and its usefulness in prevention.
OIM19 - Basic knowledge of first aid at company level.
OIM20 - Knowledge and ability to apply knowledge of databases.
OIM21 - Basic knowledge of computer systems and programming aimed at industrial applications.
OIM22 - Ability to apply knowledge of mathematics, science and engineering to implement algorithms in a programming language.
OIM23 - Basic knowledge of visual programming.
OIM24 - Knowledge of technological applications which have been developed from the principles of contemporary physics.
OIM25 - Ability to design and improve technological devices through knowledge of operating physical laws.
OIM26 - Knowledge, understanding and ability to design and manage production systems and industrial operations.
OIM27 - Basic knowledge and application of environmental technologies and sustainability.
OIM28 - Applied knowledge of business organization in industrial operations.
OIM29 - Knowledge and ability to organize, manage and control projects.
OIM30 - Ability to programming and integration of industrial manipulators in automated cells.
OIM31 - Ability to design electronic systems and industrial instrumentation.
OIM32 - Ability to manage electronic instrumentation based on PC.
OIM33 - Knowledge of the basics of acoustic and electroacoustic transducers.
OIM34 - Knowledge of current regulations on room acoustics and environment.
OIM35 - Ability to design basic solutions to the problems of isolation and acoustic conditioning in enclosures.
OIM36 - Ability to design sound and tannoy with criteria of intelligibility.
OIM37 - Ability to design and improve technological devices through the knowledge of operating physical laws.
EDP[10] - Exercise to be performed individually and present and defend in front of a examination board, this is a project in the field of specific technologies of industrial engineering professional nature in which synthesize and integrate the competencies/skills acquired in the degree teachings.

4. ACCESS AND ADMISSION OF STUDENTS

4.1 PREVIOUS INFORMATION SYSTEMS

See annexes. Paragraph 3.

[10] EDP: End of Degree Project, In Spanish, TFG: Trabajo Fin de Grado.

4.2 ENTRY REQUIREMENTS AND ADMISSION CRITERIA

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

Despite the foregoing, paragraph 4 from Article 42 of the Organic Law of Universities establishes that, to facilitate retraining and reskilling and full and effective participation in cultural, economic and social life, the Government, prior Universities Council report, shall regulate the procedures to access the university of those who, proving a working or professional experience, do not have the educational degrees legally required to that effect. This access system, which will allow admission to any university, academic center and teaching centers, 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 (BOE[11] 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 the University Orientation Course.
  · Supporting certificate of having passed the Pre-University Course.
  · Any other degree that the Ministry of Education, Social Policy and Sport declares equivalent to the Baccalaureate regulated by the Organic Law of Education 2/2006 of May 3rd.

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

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

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

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

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

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

The University of Málaga 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 and professional experience.

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

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

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

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 2/2006 of June 3rd, on Education, the entrance test regulated by Chapter II of this Royal Decree 1892/2008 shall be applied from the academic year 2009-2010. Until the end of the academic year 2008-09 shall be applicable the Royal Decree 1640/1999, of October 22nd, by which the entrance test to university studies is regulated, as amended and supplemented by Royal Decrees 990/2000, of June 2nd, 1025/2002, of October 4th and Royal Decree 406/1988, of April 29th, on the 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.

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

According to the provisions of the Article 17 of Royal Decree 806/2006, of June 30th, by which the implementation calendar of the new education system is established by the Organic Law 2/2006 of June 3rd, on Education, amended by the first final provision of Royal Decree 1467/2007, of November 2nd, by which the Baccalaureate structure is established and its minimum teachings are set, the entrance test regulated by Chapter III of the Royal Decree 1892/2008, shall be applied from October 1st, 2009. Until September 30th of 2009, shall be applicable the Order of June 12th, 1992, by which the aptitude tests for students with 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 people over 25 years is regulated.

The access of undergraduates regulated by Article 26 of Royal Decree 1892/2008 shall be applied to the admission procedures to the university from the academic year 2010-2011. Until that time 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 university teachings leading to obtaining official degrees since Vocational Training, according to the preemption provisions established in Annex II of Royal Decree 1892/2008.

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

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

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

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

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

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

According to the provisions of article 75 of Andalusian Law of Universities 15/2003, for the sole purposes of admission to the university centers, 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 team cooperation
· Personal work organization
· Ability to work under pressure
· Ability to solve problems with initiative, decision making, creativity and critical thinking
· Leadership, responsibility and caring for the practical application of knowledge to solve real problems
· Manual skill in handling instruments or equipment
· High capacity for mobility and integration in different working environments, multidisciplinary and multilingual
· High communication capability
· Versatility to manage new situations

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

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

4.3 SUPPORT FOR STUDENTS

4.3 Support for students

4.3.1 Welcoming to the new students.
Hosting action: academic event in which the Management Team of the High Polytechnic University School welcomes the new students of all degrees. It is performed the day before the first official class and in this event all members of the management team are presented, explaining the functions of each one of them. Also allusions are made to center infrastructure, information technology, website, virtual campus of the University of Málaga 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 center and the syllabus of their degrees: career opportunities, schedules, exam schedule, access requirements to the degree, etc.Also, this CD collects important aspects of the convergence process to European Higher Education Area within the branch of engineering and in particular the sub-branch of industrial engineering.

4.3.3. Support and guidance for foreign students.

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

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

4.3.4. Specific support for students with disabilities.

The University of Málaga considers that attention to the educational needs of students with disabilities is a recognition of the values of the person and their right to higher education. For this reason and with the objectives of: a) to ensure equal opportunities and full integration of disabled university students in academic life and b) to promote sensitivity and awareness of other members of the university community, the University of Malaga that, through its Vice-Chancellorship of Social Welfare and Equality, offers an office intended to the assistance of their students with disabilities: Support Service for Students with Disabilities (SAAD[12]).

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, desks, chairs...
- Adaptation of class material: notes, practice.

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 anexess. Paragraph 4.

Recognition of credits obtained by Accreditation and Professional Experience	
MÍNIMUM	MAXIMUM
0	36

Transfer System and Credit Recognition

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

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

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

- Subjects and/or credits obtained, corresponding to studies leading to university degrees of official value throughout the national territory, undertaken in university centres.
- Studied subjects, corresponding to other university degrees different from the ones of official value throughout the national territory.
- Studied subjects, corresponding to higher artistic education.
- Studied subjects, corresponding to advanced vocational education.
- Studied subjects, corresponding to professional plastic arts and design higher education.
- Studied subjects, corresponding to sports higher education.
- Work experience resulting from participation in Cooperative Education Programs (Internships).
- Work or professional experience not related to Educational 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 Málaga), 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 competencies and knowledge, and those required by the corresponding syllabus at the University of Malaga, and in accordance with the following criteria:

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

• In no case the Final Degree Projects may be recognized 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 recognized 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 recognized 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 recognized the credits obtained in the degree of origin by validation or count, where they have been recognized 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 recognized 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 recognize (non-university) official higher education 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 Educational Cooperation Programmes, shall be made taking into account the relationship with the competencies inherent to the degree, and shall be counted at the rate of one credit for each accredited year. In the case of work experience related to Educational Cooperation Programmes, the count shall be performed at a rate of one credit for every twenty-five accredited hours. In both cases, the number of counted credits may not exceed 15% of the total of the corresponding degree.

The recognition applications for participating in university cultural, sports, student representation, solidarity and cooperation activities, shall be resolved by the sole Government body of the University of Malaga with 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 Center and degree of the University of Malaga to which the respective recognition is wished to apply.
- It shall not be possible to recognise a higher number of credits above 5% of the total of destination degree altogether.
- Within the limit prescribed in the preceding paragraph, a credit shall be counted every 25 hours of participation in university cultural, sports, student representation, solidarity and cooperation activities.
- Studies of specialization, updating and continuous or permanent training or postgraduate shall be considered as university cultural activities while accredited by other degrees issued by the University of Malaga, as well as activities of academic and/or professional orientation organised by the University.
- They may be considered as university cultural activities those courses organized by the foundations promoted by the University of Malaga
- They shall only be considered university activities of student representation those one belonging to collegiate government bodies and/or representation of a Spanish University, or fees arising from those, provided by the University Statutes or theirs implementing rules.

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

4.5 COURSE OF ADAPTATION FOR GRADUATES

NUMBER OF CREDITS	

1. ADAPTATION COURSE DESCRIPTION

1.0. TITLE:

UNIVERSITY EXPERTISE OF ADAPTATION TO DEGREE IN INDUSTRIAL MECHANICS

1.0.1. Type of Teaching (Tick appropiate):

	Master (60 credits minimum)
x	Expert (30 credits minimum)

1.0.2. Field (Tick appropiate; only one field)

	Health Sciences
	Sciences
	Social and Legal Sciences
	Art and Humanities
x	Engineering and Architecture

1.1. CENTRE/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:

	In person class	x	Blended learning		On-Line

1.3. INFORMATION WEBSITE FOR STUDENTS:

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

1.4. ACADEMIC DIRECTOR

Name and surname	NIF:
ALEJANDRO RODRÍGUEZ GÓMEZ	33381949-W

Category

UNIVERSITY PROFESSOR

Knowledge area:

ELECTRICAL ENGINEERING

Department:

ELECTRICAL ENGINEERING

Signature: ALEJANDRO RODRIGUEZ GOMEZ

ACADEMIC VICE-RECTOR

Name and surname:	NIF:
Guerra Fernández, Antonio	33389185-Q

Category:

UNIVERSITY PROFESSOR

Knowledge area:

MECHANICAL ENGINEERING

Department

MECHANICAL ENGINEERING

Signature: Antonio Guerra Fernández

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 offered European credits of the degree	36 ECTS

1.7. BRIEF DESCRIPTION OF THE COURSE

A blended learning course which provides the necessary competencies to complete the formation of graduates in Industrial Engineering specialty of Mechanics, opting to the Degree in Mechanical Engineering

1.8. SYLLABUS

Module I: Competential updating with 36 ECTS divided into six subjects of 6 ECTS each: Fundamentals of Electronics, Automation, Manufacturing Engineering
Calculation and Design of Fluid Machines. Materials Technology,

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/economiainnovacionciencia yempleo/

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
Máster	€	€	
Expert	26 €	936 €	36 ECTS

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

2. JUSTIFICATION

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

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

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 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 Final Degree Project.

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

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

The above, together with the analysis of skills to acquire, implies to plan an Adaptation Course in which each 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 Final Degree Project) which would serve to develop the skills not covered by the degrees to be phased out and introduced in the degrees of Engineering of the Industrial Branch. This 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 competencies 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 Final Degree Project is mandatory.

COMPETENCIES

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 Industrial Electronics into new competencies emerged after the implementation of the new degrees within the European Higher Education Area.

3.2. Core and specific competencies students should acquire during their studies and are required to grant the degree

The competencies 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 competencies 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 competencies. The study of these competencies was set in agreement with the Recognition Commitee 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 COMPETENCIES 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 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 competencies 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 audience. . Students should have developed the skills needed to undertake further study with a high level of autonomy.
CORE COMPETENCIES OM CIN 351/2009	Ability to write, sign and develop projects in the field of industrial engineering aimed, according to the knowledge acquired as core competencies formation, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energetic facilities, electrical and electronic installations, installations and industrial plants and manufacturing processes and automation. Knowledge in basic and technological aspects, to enable them to learn new methods and theories and equip them with versatility to adapt to new situations. · Ability to solve problems with initiative, decision making, creativity, critical thinking and to communicate and transmit knowledge and skills in the field of Industrial Engineering. . Knowledge to perform measurements, calculations, valuations, appraisals, professional reports, studies, reports, work plans and other similar work. Ability to manage specifications, regulations and obligatory standards. . Ability to work in a multilingual and multidisciplinary environment. . .
SPECIFIC COMPETENCIES Industrial branch OM CIN351/2009	· Knowledge of the basics of electronics · Knowledge of the basics of automation and control methods . Basic knowledge and application of environmental technologies and sustainability. . Applied knowledge of systems and manufacturing processes, metrology and quality control. . Knowledge and Skills for calculation, design and testing machines. Applied knowledge of thermal engineering Applied knowledge of fundamentals of fluid systems and machines. Knowledge and skills in the application of engineering materials.

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

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

To participate in the admission prcess at any Curricular Itenerary

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

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

University Center 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 Admission Offices:

University of Malaga. Access Office. Campus 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, center 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 "full respect for fundamental rights and the principles of equality, merit and ability".

Accessing by the special way and contained in Resolution of the Directorate General of Universities laying in the agreement of February 6, 2013 of the Commission's Single District College student of Andalucía for the admission procedure is set to specific curricular itineraries for those having a degree of technical architect, engineer, graduate or teacher intending to obtain the degree. http://www.juntadeandalucia.es/boja/2013/42/14

In this adaptation course can only be accessed by applicants with a degree in Technical Industrial Engineering Mechanical specialties, obtained according to plans regulated by the Organic Law 11/1983 studies, August 25, University Reform, 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 Mechanical specialty.

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

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

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

- 60% academic records in the degree of origin.

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

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

The record is assessed on the maximum possible 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 with respect to other candidates in the same competition. For the same reason, in any case that score can be extrapolated or comparable with that obtained in one or more other competitions where each candidadate takes part.

SUPPORT AND GUIDANCE TO STUDENTS, ONCE REGISTERED.

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

SPECIFIC SUPPORT FOR STUDENTS WITH DISABILITIES

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

4.5 Selection criteria for awarding grants

Income.

Academic performance in the course

4.6 Transfer and credit recognition

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

Considering that the Degree in Mechanical Engineering includes 240 credits, the maximum credits that could recognize is 36 credits.

As it is reflected in the agreement of the Committee of Degrees of the Industrial Branch in the University System Andalusian Public, the Academic Committee belonging to the body responsible for the Adaptation Course will performe 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 competencies in the subjects.

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Distribution of the Syllabus in European credits

TEACHING METHODS	EUROPEAN CREDITS
Theoretical /practical teaching in classroom	24 ECTS
On-line Teaching	12 ECTS
Internships in companies	0 ECTS
Fnal Degree Project for Adapation Course	0 ECTS
EUROPEAN TOTAL CREDITS	36 ECTS
Total of in-class 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; in person classes will be performed every Friday from 16h-21: 30 pm and Saturdays from 8: 45-14: 15 h.

In person classes 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 / or assessment of each module / subject

- Consultations by email and / or discussion forums

This structure will allow to acquire the skills for each subject that will be evaluated by, at least, four partial exams for each of the subjects , as included in "5.2.4. Assessment and qualification systems. "

5.2. Detailed description of the modules / matters / subjects of the teachings in the Syllabys

GENERAL INFORMATION	
Designation of the Module	Module: Updating the competencies. Subject: Fundamentals of Electronics, Automation, Manufacturing Engineering, Computing and Machine Design, Fluid Mechanical Machines, Materials Technology
Number of European Credits (in person / online): 36 ECTS (6 ECTS each subject). Blended learning.	
Nature (Mandatory / Optional): Required	
Temporary Unit: Semester	

5.2.1 Competencies

COMPETENCIES	DEFINITION
CORE COMPETENCIES	· Students should demonstrate knowledge and understanding in the area of Electrical Engineering and Industrial branch

RD 1393/2007	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 show competencies 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 audience. . Students should have developed the skills needed to undertake further study with a high level of autonomy.
GENERIC COMPETENCIES OM CIN 351/2009	Ability to write, sign and develop projects in the field of industrial engineering aimed, according to the knowledge acquired as core competencies formation, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energetic facilities, electrical and electronic installations, installations and industrial plants and manufacturing processes and automation. Knowledge in basic and technological aspects, to enable them to learn new methods and theories and equip them with versatility to adapt to new situations. . Ability to solve problems with initiative, decision making, creativity, critical thinking and to communicate and transmit knowledge and skills in the field of Industrial Engineering. Knowledge to perform measurements, calculations, valuations, appraisals, professional reports, studies, reports, work plans and other similar work. Ability to manage specifications, regulations and obligatory standards. Ability to work in a multilingual and multidisciplinary environment.
SPECIFIC COMPETENCIES Industrial branch OM CIN351/2009	Knowledge of the basics of electronics Knowledge of the basics of automation and control methods Basic knowledge and application of environmental technologies and sustainability Applied knowledge of systems and manufacturing porcesses, metrology and quality control. Knowledge and skills for calculation, design and testing machines Applied knowledge of thermal engineering Applied knowledge of fundamentals of fluid systems and machines. Knowledge and skills in the application of engineering materials.

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

- Theoretical and practical in person classes where the necessary knowledge for the achievement of cognitive and comprehensive competencies 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 competencies of solving engineering problems with restrictive conditions and develop the aptitudinal and attitudinal competencies.
- Assessment, which will ensure the achievement of specific competencies.

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 requirer 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 quialifications 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 the has acquired in the course of their professional life.

Therefore, the proposed system is a competencies evaluation system which ensures the acquisition of defined competencies 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. Attendance to in person classes.

The evidence of item A will be defined by the Professor in charge of the teaching of each subject and referred to the Academic Dean to be included in the virtual campus platform so that they can be performed by students of the course and they achieve the grades automatically.

The final assessment systemss of this subject is expressed numerically, according to the provisions of art. 5 of Royal Decree 1125/2003, of September 5 (BOE September 18), whereby the European Credit System and Grading System in university degrees which are official and its validity throughout the national territory is established.

5.2.5 Brief description of contents

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

FUNDAMENTALS OF ELECTRONICS

This subjetc corresponds to a basic electronics course in engineering studies which consists of two parts. The first corresponds to analog electronics where starting from basic fundamentals of linear circuits and amplification. Diodes, transistors and operational amplifiers are studied and circuits with all these elements are analyzed. In the second part the fundamentals of digital logic, where from logic functions and Boolean algebra the devices and logic gates and combinational circuits are analyzed.

AUTOMATION

Subject which describes a basic course in a few automatic engineering studies where concepts and types of systems and automation are presented. The control engineering and industrial automation are introduced. Necessary tools for the analysis of linear systems as Laplace transforms and Z sampled systems and transfer functions are studied. The transient response of systems for first and second order is presented. Finally an introduction to control systems is carried out.

MANUFACTURING ENGINEERING

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

CALCULATION AND DESIGN OF MACHINES

The fundamentals of calculation and design of machines are studied, considering the fatigue design and design of axles. The elements of machines are presented and studied, as different configurations of gears, springs, joints and bearings and elements such as screws. Flexible transmission elements are analyzed in addition to the different coupling parts such as brakes and clutches, studying lubrication and sliding bearings.

MECHANICAL FLUID MACHINES

In this subject, the fundamentals and basic applications of mechanical fluid machines for application to practical situations in industry and other economic sectors are presented. Hydraulic turbomachinery, rotodynamic pumps and fans are analyzed. Hydraulic turbines and positive displacement machines are studied. Finally, thermal turbines, turbochargers and compressors are presented.

TECHNOLOGY OF MATERIALS

This subject is the continuation of Science of Materials, where the techniques used in the inspection and obtaining materials and their treatment are presented. The performance is studied for practical application and placed in materials engineering. For practical application, recycling and recovery of need for sustainable development of industry materials are studied.

5.2.6 Module Contents:

		Credits
1.-	Fundamentals of Electronics Basics of linear circuits. Amplification. Diodes. Bipolar diodes Circuits (BJT). Circuits with transistors. Differential stages. Operational amplifiers. Circuits with Operational amplifiers. Fundamentals of digital logic. State definition. Logic functions. Boolean Algebra Logic Devices. Logic gates. Combinational	6
2.-	Automation. Concept and types of systems. Concept and types of automation. Computing control. Control Logic Engineering. Industrial Automation. Examples of automation. Programmable controllers. Linear systems. Laplace Transform and Z-Transform Sampled Systems. Transfer functions. Description in the state space. Transient response of systems for first and second order. The closed-loop concept. Introduction to Control Systems. Examples of Control Systems.	6
3.-	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
4.-	Calculation and Machine Design Introduction. Fundamentals. Fatigue design. Axle design. Gears. Spur Gear, Helical and Bevel. Worm screw. Springs. Joints. Spindles. Bearings. Flexible transmission elements. Brakes, Clutches and Couplings. Lubrication and sliding bearings.	6
5.-	Fluid mechanical machines. Hydraulic turbomachines. Rotodynamic pumps and fans. Hydraulic turbines. Positive displacement machines. Thermal turbines. Turbochargers. Compressors.	6
6.-	Technology of Materials Inspection Techniques of materials. Techniques for obtaining and processing materials. Inservice behaviour. Materials Engineering. Recycling and valuation of materials	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	NIF	Department / Company of origin	Category	Credits for each Professor	Module / matter / subject	In-person classes hours

Firstly faculty of the UMA and then another teacher, arranged alphabetically by surname and name)					that are per credits	
de la PAZ MOYA, MANUEL	26457431-W	Sys. and Aut.Engineering	LECTURER[13]	6	Competencial updating / Automatics	30
FERNANDEZ GUTIÉRREZ, ALBERTO	52576058-J	Thermal engines and machines	LECTURER	6	Competencial updating / Fluid Mechanical Machines	30
GARCIA VACAS, FRANCISCO M.	23783399-L	Mechanical Engineering	LECTURER	2	Competencial updating / Machine Design	10
GUERRA FERNANDEZ, ANTONIO J.	33389185-Q	Mechanical Engineering	LECTURER	2	Competencial updating / Machine Design	10
HERRERA FERNÁNDEZ, MANUEL	52573434-B	Civil, materials and manufacturing engineering	ASSOCIATED LECTURER[14]	3	Competencial updating / Manufacturing Engineering	15
LOPEZ ROMERO, FERNANDO	27212467	Civil, materials and manufacturing engineering	LECTURER	3	Competencial updating / Manufacturing Engineering	15
NAVAS BORRERO, JOSE LUIS	24859611-S	Electronic Technology	LECTURER	3	Competencial updating / Fundamentals of Electronics	15
PEREZ DE LA BLANCA, ANA	25701715-C	Mechanical Engineering	LECTURER	2	Actualización competencial / Machine design	10
SOTORRIOS RUIZ, PEDRO	24805015-K	Electronic Technology	FACULTY PROFESSOR	3	Competencial updating / Fundamentals of Electronics	15
VILLAVIEJA URZAINQUI, ANGEL	25166441-k	Civil, materials and manufacturing engineering	ASSISTANT LECTURER	6	Competencial updating / Materials Technology	30

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 and required experience to teach the subjects in the course of adaptation, if included on the Human Resources Verified Memory of the Degree of Industrial Electronics 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: Mª 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: Mª CARMEN SALAS ARENAS Department or contact location: Administrative Secretary Phone: 951 952 482 E-mail: mcsalas@uma.es
Name and surname: MARGARITA MERELO SANCHEZ Department or contact location: Administrative Secretary Phone: 951 952 478 E-mail: mms@uma.es
Name and surname: INMACULADA MUÑOZ RUIZ Department or contact location: Administrative Secretary Phone: 951 952 310 E-mail: inmamruiz@uma.es

Justification of the adequacy of the material resources and available services

[13] Hiring modality in Spanish Universities: *Profesor Titular de Escuela Universitaria*

[14] Hiring modality in Spanish Universities: Profesor Asociado

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 100%, 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 the indicator measurement.	

8.3. Justification of the estimates.

To estimate the indicators, the rates employed in the application for verification of the Degree in Mechanical Engineering at the University of Málaga were considered, validated by ANECA[15], 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 Degree in Mechanical Engineering will be adjusted with the model which is annexed, this was approved at a meeting of the Governing Council of the University of Malaga, celebrated on April 18, 2013

9.1 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 Service, Strategic Planning and Social Responsibility, which will be responsible for their valuation as long as the data is in the database of the University of Málaga.

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

Information Analysis and Improvement of the System

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

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

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

Not applicable

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

[15] ANECA: en español, *Agencia Nacional de Evaluación de la Calidad y Acreditación*

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

Recollecting Data.

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

Information Analysis and Improvement of the System

The Committee of Quality Assurance of the Degree shall 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 of employability of the degree: average time it takes for graduates to start working.

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

Meetings will be necessary to test the satisfaction for the Personnel of Administration and Services, linked to administrative management of the program. If there are a very high number of PAS, a questionnaire will be required.

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

Once the data are submitted from different groups involved by the Commission on Quality Assurance Degree, the Degree Sections will send the data necessary for the completion of the questionnaires (emails) to Service, Strategic Planning and Social Responsibility Service is responsible for managing the questionnaires through 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 valuating satisfaction groups (results of questionnaires, etc.)

PROCEDURE TO MANAGE SUGGESTIONS AND COMPLAINTS

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

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

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

The Degree must include on its website a link of the System of Complaints, Suggestions and Congratulations from the University of Málaga: http://dj.uma.es/quejasysugerencias/ 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 Service, Strategic Planning and Social Responsibility will send a report of the complaints, suggestions and compliments regarding the Degree, including the suggestions and compliments received, recollected and also processed. This report together with the complaints will be taken into account to prepare the Annual Report of the Results of Degree, as well as to prepare the Improvement Plan.

5. TEACHINGS PLANNING

5.1 DESCRIPTION OF THE SYLLABUS
See annexes. Paragraph 5.
5.2 LEARNING ACTIVITIES
IN-PERSON LEARNING ACTIVITIES
E- LEARNING ACTIVITIES
ASSESSMENT
5.3 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
In-Person classes: ACTIVITIES OUTSIDE THE UNIVERSITY (CLINICAL PRACTICE, IN INSTITUTIONS, IN COMPANIES, FIELDWORKS, VISITS TO CENTERS/INSTITUTIONS…).
In-Person classes: SEMINARS/WORKSHOPS, REVIEW, DISCUSSION.
E-Learning classes: PRESENTATIONS (MASTERCLASSES, CONFERENCES AND ON-LINE PRESENTATIONS).
E-Learning classes: PRACTICAL ACTIVITIES (PROBLEMS, PROJECTS, DESIGNS AND CASE STUDIES.
E-Learning classes: DOCUMENTATION ACTIVITIES (BIBLIOGRAPHIC/DOCUMENTARY RESEARCH, TEXT COMMENTARY, GLOSSARIES, DATABASES…)
E-Learning classes: DOCUMENTS (REPORTS, MEMORIES, ESSAYS, DOSSIER, DIARIES, PORTFOLIOS...).
E-Learning classes: DISCUSSION ACTIVITIES (PARTICIPATION IN FORUMS, WIKIS, CHATS, ON-LINE SEMINARS…).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).
E-Learning classes: ASSESSMENT ACTIVITIES (ON-LINE TESTS, SURVEYS, QUESTIONNAIRES…).
In-Person classes: TUTORING.
In-Person classes: ASSESSMENT ACTIVITIES (END OF DEGREE PROJECT)
5.4 ASSESSMENT SYSTEMS
CONTINUOUS OR TRAINING ASSESSMENT (BETWEEN 0% AND 100% OUT OF GRADES): Masterclasses, problem solving, laboratory practice, personal work, follow-up exams.
FINAL EXAM (BETWEEN 20% AND 80% OUT OF GRADES): In-class test: two hours minimum – four hours maximum.
DEFENSE OF THE FINAL DEGREE PROJECT IN FRONT OF AN EXAMINING BOARD.
5.5 LEVEL 1: CORE LEARNING
5.5.1 Core Information Level 1
LEVEL 2: BUSINESS
5.5.1.1 Core Information Level 2

TYPE	BRANCH	SUBJECT
CORE	Engineering and Architecture	Business Administration
ECTS LEVEL2	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 ADMINISTRATION		
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 Company.

Science, technology and industry systems.

Competitiveness and innovation.

Social responsibility.

Business policy and strategy.

Business creation.

Management techniques.

Financial management.

Commercial management systems.

Production management system.

Human resources.

Corporate risk management.

Quality management.

Environmental management.

Projects.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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 – Prove students have developed 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.

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 organize and planning in the field of business and other institutions and organizations.

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

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

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

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS

In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).

In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).

In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).

E-Learning classes: PERSONAL STUDY.

In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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.		100.0

LEVEL 2: GRAPHICAL EXPRESSION		
5.5.1.1 Core Information Level 2		
TYPE	BRANCH	MATTER
BÁSIC	Enginieering and Architecture	Graphical expression
ECTS LEVEL2	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	OTHERS	
No	No	

NIVEL 3: GRAPHIC EXPRESSION IN ENGINEERING		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
CORE	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
	6	
ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
ECTS Semester 7	ECTS Semester 8	ECTS Semester 9
ECTS Semester 10	ECTS Semester 11	ECTS Semester 12
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	CATALAN	BASQUE
Yes	No	No

GALICIAN	VALENCIAN	ENGLISH
No	No	No
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHERS	
No	No	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Metric geometry.

Principles of Normalization.

Dihedral system I: General principles.

Representation Systems II: Dihedral (distances).

Representation Systems III: Dihedral (angles).

Representation Systems IV: Dihedral (flat sections).

Representation Systems V: Dihedral (Sup. Intersection).

Representation Systems VIII: Axonometric perspective.

Representation Systems IX: Cavalier projection.

Representation Systems X: Dimensioned drawings.

Introduction to CAD[16].

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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

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

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

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

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
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS

In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).

In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).

[16] CAD: Computer-aided drafting

In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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

LEVEL 2: PHYSICS		
5.5.1.1 Core Information Level 2		
TYPE	BRANCH	MATTER
CORE	Engineering and Architecture	Física
ECTS NIVEL2	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	OTHERS	
No	No	

LEVEL 3: PHYSICS I		
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	OTHERS	
No	No	
NIVEL 3: FÍSICA II		
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	OTHERS	
No	No	
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Physics I 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 COMPETENCIES		
5.5.1.5.1 CORE AND GENERAL COMPETENCIES		

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 organize and planning in the field of business and other institutions and organizations.
A11 – Knowledge, understanding and ability to apply the necessary legislation in the exercise of the profession of Engineer.
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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
B1 – Ability to solve mathematical problems that may arise in engineering. Ability to apply knowledge of linear algebra; geometry; differential and integral calculus; differential and partial derivatives equations; numerical methods; numerical algorithms; statistics and optimization.
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
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OUT OF GRADES):	0.0	100.0

In-class test: two hours minimum – four hours maximum.		
LEVEL 2: COMPUTING		
5.5.1.1 Core Information Level 2		
TYPE	BRANCH	MATTER
CORE	Engineering and Architecture	Computing
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	OTHERS	
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 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	OTHERS	
No	No	
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		

Computer and information.

Computer structure.

Basics of operating systems.

Basics of databases.

Algorithms and programs.

Introduction to programming in C language.

Control structures.

Functions.

Structured data.

Communication systems: computer and internet.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

B3 – Basic knowledge on using and programming computers, operating systems, databases and software with applications in engineering.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS

In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).

In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).

In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).

E-Learning classes: PERSONAL STUDY.

In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

5.5.1.8 ASSESSMENT SYSTEMS

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

.		
LEVEL 2: MATHEMATICS		
5.5.1.1 Core Information Level 2		
TYPE	BRANCH	MATTER
CORE	Engineering and Architecture	Mathematics
ECTS NIVEL2	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	OTHERS	
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	OTHERS	
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	OTHERS	
No	No	
LEVEL 3: EXTENSION OF 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: VECTORIAL 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	OTRAS	
No	No	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Linear Algebra
Matrices y determinants.
Linear systems of equations. Rouché, Gauss, Gauss-Jordan.
Vector spaces: linear applications: vectors and eigenvalues. Diagonalization of matrices.
Numerical linear algebra: mistakes. Numerical solution of equations and systems of equations.
Calculation of eigenvalues and eigenvectors.
Affine and euclidean space: problems and related metric in the plane and three-dimensional space.
Related applications: movements, conical and quadric.
Matrix exponential. Linear systems of differential equations and linear differential equations of n order. 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.
Geometric and physical applications. Root-finding algorithm. Seminars on graphing functions in one and several variables and curve fitting to a dataset.
Numerical series and series of functions: Taylor series and Fourier series. Integration of real functions of a real variable. Primitives. Geometric and physical applications.
Interpolation and approximation of functions. Derivation and numerical integration.
Vector fields and scalar fields. Limits and differentiability of fields. Taylor theorem.
Maxima and minima, conditioned extremes.
Using mathematical packages in order to represent functions and problem solving.

Vectorial and Statistical Analysis
differential geometry: curves and surfaces in space, frenet trihedron, gaussian and mean curvature for surfaces. Integral line. Double and triple integral.
Surface integral. Integral theorems. Use of mathematical packages in order to represent curves and surfaces and problem solving.
Dimensional and two-dimensional descriptive statistics.
Introduction to discrete mathematics: use of numerical algorithms and techniques count. Calculus of probabilities. Random variables and fundamental distributions. Confidence intervals and hypothesis tests.
Use of mathematical packages for data processing.

Advanced Calculus
Ordinary differential equations (ode[17]), first order: cauchy problem, elementary first order types ode, geometric problems.
Ode higher order: reduction of order and notable changes in variables. Linear equations of order n: homogeneous, wronskian, not homogeneous. Euler equation.
Laplace transform: application to solving ode of order n linear systems of differential equations.
Numerical solution of differential equations and systems of differential equations.
Methods of complex variable: analytic function and harmonic function. Cauchy theorem. Cauchy integral. The residue theorem.
Conformal transformations: dirichlet problem.
Partial differential equations: introduction: types of solutions. Partial differential equation of first order. Wave equation, heat equation, Laplace and poisson equations.
Use of mathematical packages for problem solving.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

[17] ODE: En español, Ecuaciones Diferenciales Ordinarias, EDO.

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

5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: SEMINARS/WORKSHOPS, REVIEW, DISCUSSION.
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).
E-Learning classes: PERSONAL STUDY.

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 practice, 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	MATTER
CORE	Engineering and Architecture	Chemistry
ECTS NIVEL2	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 Level 3		
TYPE	ECTS SUBJECT	DURATION
CORE	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
6		
ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
ECTS Semester 7	ECTS Semester 8	ECTS Semester 9
ECTS Semester 10	ECTS Semester 11	ECTS Semester 12
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	CATALAN	BASQUE
Yes	No	No
GALICIAN	VALENCIAN	ENGLISH
No	No	No
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Structure of matter and nuclear chemistry. Chemical transformations. Chemical pollution. Eectrochemistry. Instrumental analysis. Fundamentals of industrial chemistry. Applications of organic and inorganic chemistry to engineering.		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCIES		
5.5.1.5.1 CORE AND GENERAL COMPETENCIES		
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.		
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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.		
5.5.1.5.2 CROSS-CURRICULUM		
No data		
5.5.1.5.3 SPECIFIC		
B4 – Ability to understand and apply the principles of basic knowledge of general chemistry, organic/inorganic chemistry and their applications in engineering.		

5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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

5.5 LEVEL 1: COMMON LEARNING TO INDUSTRIAL BRANCH I
5.5.1 Core Information Level 1
LEVEL 2: SCIENCE AND ENGINEERING OF MATERIALS

5.5.1.1 Core Information Level 2	
TYPE	REQUIRED
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: SCIENCE OF MATERIALS		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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		

Unit 1: Introduction.
Unit 2: The structure of materials.
Unit 3: Behaviour of materials.
Unit 4: Study of metal materials.
Unit 5: Study of ceramics.
Unit 6: Study of polymeric materials.
Unit 7: Study of composite materials.

5.5.1.4 OBSERVATIONS
5.5.1.5 COMPETENCIES
5.5.1.5.1 CORE AND GENERAL COMPETENCIES
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.
CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
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.
C9 – Basic knowledge of production and manufacturing systems.
5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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	REQUIRED
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: MANUFACTURING ENGINEERING		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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 production systems and manufacturing.

Fundamentals of manufacturing processes.

Technological aspects of the manufacturing process.

Environmental implications in manufacturing.

Sustainable manufacturing.

Production systems.

Automated manufacturing systems.

Organization of production.

Manufacturing quality engineering.

- Foundry operations.

- Operations in a plastic deformation workshop.

- Operations in a Welding Workshop I.
- Operations in a Welding Workshop II.
- Operations in a Machining Workshop I.
- Operations in a Machining Workshop II.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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

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

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

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

A7 – Ability to 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.

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

C9 – Basic knowledge of production and manufacturing systems.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS

In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).

In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).

In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).

E-Learning classes: PERSONAL STUDY.		
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).		
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 practice, 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: FLUID MECHANICS		
5.5.1.1 Core Information Level 2		
TYPE	REQUIRED	
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
REQUIRED	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

Part I. General characteristics of fluids.

Part II. Kinematic description of fluid motion.

Part III. Dimensional analysis concepts and physical resemblance.

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

Part V. Movements at high Reynolds numbers.

Part VI. Laminar and turbulent motions.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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.

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.

CC1 – Prove students 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 competencies typically proved through devising, sustaining arguments and solving problems within their field of study.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

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

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS

In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).

In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

5.5.1.8 ASSESSMENT SYSTEMS

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

LEVEL 2: THERMOTECHNICS

5.5.1.1 Core Information Level 2

TYPE	REQUIRED
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: THERMOTECHNICS

5.5.1.1.1 Core Information Level 3

TYPE	ECTS SUBJECT	DURATION
REQUIRED	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

Unit 1: Exergy Analysis of thermodynamic systems. Exergy concept. (3h)

Unit 2: Steam power cycles. (3h)

Unit 3: Power generation with gas cycles. (3h)

Unit 4: Refrigerators and heat pump cycles. (3h)

Unit 5: Nonreactive ideal gas mixtures and psychrometry. (3h)

Unit 6: Reactive mixtures and combustion. (3h)

Unit 7. General concepts of heat transfer. (1h)

Unit 8. Heat transfer by conduction. (3h)

Unit 9. Convective heat transfer. (3h)

Unit 10. Heat transfer by radiation. (3h)

Unit 11. Applications facilities. (3h)

Practice 1. Stirling engine. (2h)

Practice 2. Steam turbine cycles. (3h)

Practice 3. Cycle gas turbine. (3h)

Practice 4. Alternative motor cycles. (2h)

Practice 5. Refrigerator study vapour compression cycle. (2h)

Practice 6. Solid thermal conductivity. (2h)

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

CC1 – Prove students 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 competencies typically proved through devising, sustaining arguments and solving problems within their field of study.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

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

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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: AUTOMÁTIC

5.5.1.1 Core Information Level 2		
TYPE	REQUIRED	
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: AUTOMATIC		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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 Automation. Introduction to Automatic Control.		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCIES		
5.5.1.5.1 CORE AND GENERAL COMPETENCIES		
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 – Prove students 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 competencies 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.		
5.5.1.5.2 CROSS-CURRICULUM		
No data		
5.5.1.5.3 SPECIFIC		

C6 – Knowledge of the basics of automation and control methods.		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100
5.5.1.7 TEACHING METHODS		
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).		
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).		
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).		
E-Learning classes: PERSONAL STUDY.		
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).		
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 practice, 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: ELECTRÓNICS		
5.5.1.1 Core Information Level 2		
TYPE	REQUIRED	
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: ELECTRONIC FUNDAMENTALS		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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		
1. Linear Circuits. 2. Logic Circuits.		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCIES		
5.5.1.5.1 CORE AND GENERAL COMPETENCIES		
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.		
CC1 – Prove students 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 competencies 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.		
5.5.1.5.2 CROSS-CURRICULUM		
No data		
5.5.1.5.3 SPECIFIC		
C5 – Knowledge of the basics of electronics.		

5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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: ELECTROTECHNICS		
5.5.1.1 Core Information Level 2		
TYPE	REQUIRED	
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 ELECTROTECHNICS		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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		
Unit 1: Introduction to the theory of circuits. Unit 2: Technical analysis of circuits. Unit 3: Theorems and additional analytical techniques. Unit 4: Stationary sine regime. Unit 5: Triphasic systems. Unit 6: Elements in electrical systems.		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCIES		
5.5.1.5.1 CORE AND GENERAL COMPETENCIES		
CC1 – Prove students 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 competencies 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.		
5.5.1.5.2 CROSS-CURRICULUM		
No data.		
5.5.1.5.3 SPECIFIC		
C4 – Knowledge and use of the principles of circuit theory and electrical machines.		
5.5.1.6 LEARNING ACTIVITIES		

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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 IV
5.5.1 Core Information Level 1
LEVEL 2: MACHINES AND MECHANISMS

5.5.1.1 Core Information Level 2	
TYPE	REQUIRED
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: THEORY OF MACHINES		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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

Unit 1: Introduction to the study of mechanisms.
Unit 2: Kinematic analysis of flat mechanisms.
Unit 3: Dynamic analysis of mechanisms.
Unit 4: Balance.
Unit 5: Flywheels.
Unit 6: Vibrations.
Unit 7: Gears.

Practice 1: Programme of analysis of mechanisms.
Practice 2: Couple on a rod-crank mechanism calculation chart.
Practice 3: Rotor balancing.
Practice 4: Transmission of four gears.
Practice 5: Simple planetary gear train.
Practice 6: Double planetary gear train.
Practice 7: Automatic transmission with three gears.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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.
A10 – Ability to work in a multilingual and multidisciplinary environment.
CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
B1 – Ability to solve mathematical problems that may arise in engineering. Ability to apply knowledge of linear algebra; geometry; differential and integral calculus; differential and partial derivatives equations; numerical methods; numerical algorithms; statistics and optimization.
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.
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.
C7 – Knowledge of the principles of machines and mechanisms theory.
C8 – Knowledge and use of the principles of resistance of materials.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, personal work, follow-up exams.	0.0	100.0

FINAL EXAM (BETWEEN 20% AND 0.0 80% OUT OF GRADES): In-class test: two hours minimum – four hours maximum.		100.0
LEVEL 2: RESISTANCE OF MATERIALS		
5.5.1.1 Core Information Level 2		
TYPE	REQUIRED	
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: RESISTANCE OF MATERIALS		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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		

Unit 1: Introduction to elasticity and resistance of materials.
Unit 2: The elastic solid.
Unit 3: Plasticizing and breaking criteria.
Unit 4: Resistance of materials. Basics.
Unit 5: Traction and compression.
Unit 6: Elastic flat flexion.
Unit 7: Introduction to the calculation of plasticity.
Unit 8: Deflected flexo-compression.
Unit 9: Torsion in circular profiles.
Unit 10: Elastic bar potential. Energy methods.
Unit 11: Instability of prismatic bars. Buckling.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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.

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

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

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS

In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).

In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).

In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).

E-Learning classes: PERSONAL STUDY.

In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).		
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 practice, 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: PROYECTOS		
5.5.1.1 Core Information Level 2		
TYPE	REQUIRED	
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: TECHNICAL OFFICE		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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

Unit 1: The work of engineering: The industrial technician.
Unit 2: The technical office and its organization. Computer applications to T.O
Unit 3: Reviews, valuations, technical reports and certificates.
Unit 4: Industrial projects.
Unit 5: Project documents: General index. Memory and annexes.
Unit 6: Project documents: Planes.
Unit 7: Project documents: Tender specifications.
Unit 8: Project documents: State of measurements.
Unit 9: Project documents: Budget.
Unit 10: Project documents: Ad hoc studies.
Unit 11: Construction management.
Unit 12: Industrial facilities regulations and their applications.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

C12 – Knowledge and skills to organize and manage projects.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: ACTIVITIES OUTSIDE THE UNIVERSITY (CLINICAL PRACTICE, IN INSTITUTIONS, IN COMPANIES, FIELDWORKS, VISITS TO CENTERS/INSTITUTIONS…).

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 practice, 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: GRAPHIC ENGINEERING AND TOPOGRAPHY		
5.5.1.1 Core Information Level 2		
TYPE	REQUIRED	
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: GRAPHIC MECHANICAL ENGINEERING AND TOPOGRAPHY		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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

Unit 1. Tracings in boiler.

Unit 2. Cuts and sections.

Unit 3. Dimensioning and drawing sets.

Unit 4. Dimensional and geometric tolerances.

Unit 5. Surface states.

Unit 6. Detachable joints in standardized elements.

Unit 7. Fixed unions.

Unit 8. Springs.

Unit 9. Metal structures.

Unit 10. Fundamentals of surveying and cartography.

Unit 11. Topographic methods. Topometry.

Unit 12. Topographic instruments.

Unit 13. Levelling. Profiles and earthworks.

Unit 14. Rethinking work in engineering.

Unit 15. Introduction to Global Positioning Systems (GPS).

Unit 16. Geographic Information Systems (GIS) applied to mechanical engineering.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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

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

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

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

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

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
C10 – Basic knowledge and application of environmental technologies and sustainability.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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 MECHANICAL ENGINEERING I
5.5.1 Core Information Level 1
LEVEL 2: CALCULATION AND DESIGN OF MACHINES
5.5.1.1 Core Information Level 2

TYPE	REQUIRED
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: CALCULATION AND DESIGN OF MACHINES		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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		

Unit 1. Introduction. Fundamentals.
Unit 2. Fatigue design.
Unit 3. Axles design.
Unit 4. Gear: Straight, helicoidal and conical.
Unit 5. Endless screw.
Unit 6. Springs.
Unit 7. Unions.
Unit 8. Spindles.
Unit 9. Rolling bearings.
Unit 10. Flexible transmission parts.
Unit 11. Brakes, clutches and couplings.
Unit 12. Lubrication and friction bearings.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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

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

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

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

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

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

A8 – Ability to apply principles and methods of quality.

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

E2IM – Knowledge and skills for calculation, design and testing machines.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS

In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).

In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).

In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).

E-Learning classes: PERSONAL STUDY.		
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).		
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 practice, 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.		100.0

LEVEL 2: GRAPHIC EXPRESSION		
5.5.1.1 Core Information Level 2		
TYPE	REQUIRED	
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: MECHANICAL COMPUTER AIDED-DESIGN		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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

0.-Introduction.

1.-Concept of machine. Normalization in machine design.

2. Design of elements and mechanisms developing basic mechanical functions.

3.-The process of design and development through concurrent design.

4.- Machine design from a functional analysis.

5.-Use and application of computer graphics in the presentation of graphic documents.

6.-Systems CAD-CAE-CAM-PLM.

7.-Prototyping.

8.-Scanning and reverse engineering.

9.- Design of tools and mechanisms by DAO.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

E1IM – Knowledge and skills to apply the techniques of graphic engineering.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS

In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).

In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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: MECHANICAL ENGINEERING		
5.5.1.1 Core Information Level 2		
TYPE	REQUIRED	
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: EXPERIMENTAL MECHANICS AND SIMULATION TECNIQUES OF MACHINES		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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

Unit 1. Introduction to Experimental and Simulation Techniques in Mechanical Engineering.

Unit 2. Modeling Machines.

Unit 3. Finite Element Method applied to Machine Design.

Unit 4. Experimental Techniques in Mechanical Engineering.

- Photoelasticity.
- Extensometry.
- Kinematic and dynamic measurements in mechanical assemblies.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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

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

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

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

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

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

A8 – Ability to apply principles and methods of quality.

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
T7IM – Knowledge and skills for the use of experimental techniques and simulation tools of machine design.

5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 0.0 80% OUT OF GRADES): In-class test: two hours minimum – four hours maximum.		100.0

5.5 LEVEL 1: SPECIFIC LEARNING IN MECHANICAL ENGINEERING II
5.5.1 Core Information Level 1
LEVEL 2: THERMAL ENGINEERING

5.5.1.1 Core Information Level 2	
TYPE	REQUIRED
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: THERMAL ENGINEERING		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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		

Unit 1. Heat exchangers and cooling towers. 5h
Unit 2. Generation of cooling and coolants. 5h
Unit 3. Heat generation. 5h
Unit 4. Calculation of thermal loads and regulations. 5h
Unit 5. Energy balance of the facility and equipment selection. 5h
Unit 6. Thermal installations in buildings. 6h

Practice 1. Heat exchangers. 6 h.

Practice 2. Generation of cooling. 4h

Practice 3. Heat generation. 4h

5.5.1.4 OBSERVATIONS
5.5.1.5 COMPETENCIES
5.5.1.5.1 CORE AND GENERAL COMPETENCIES

A1 – Ability to write, sign and develop projects in the field of industrial engineering which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energy facilities, electrical and electronic installations, installations and industrial plants and manufacturing-automation processes.
CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
E3IM – Applied knowledge of thermal engineering.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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 MECNANICS MACHINES
5.5.1.1 Core Information Level 2

TYPE	REQUIRED	
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 MECNANICS MACHINES		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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		

Unit 1: Hydraulic Turbomachines: (3h).
Unit 2: Rotodynamic Bombs and fans (10h).
Unit 3: Hydraulic Turbines: (6h).
Unit 4: Positive displacement machines (3h).
Unit 5: Thermal Turbines: (3h).

Unit 6: Turbocompressors: (3h).
Unit 7: Compressors: (3h).

Practice 1: Trials with centrifugal pumps.
Practice 2: Coupling pumps.
Practice 3: Trials with fans.
Practice 4: Hydraulic turbines.
Practice 5: Thermal turbines.
Practice 6: Turbocompressors.
Practice 7: Trials with compressors.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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.

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

E6IM – Applied knowledge of the fundamentals of systems and mechanical fluid machines.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS

In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).

In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).

In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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: MACHINE AND HEAT ENGINES		
5.5.1.1 Core Information Level 2		
TYPE	REQUIRED	
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: HEAT ENGINES		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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

Unit 1. Introduction. 2h
Unit 2. Steam Turbines. 4h
Unit 3. Gas Turbines. 5h
Unit 4. General information of the ICE. 2h
Unit 5. Charge renewal in the ICE. Distribution system. 4h
Unit 6. Auxiliary circuits in the ICE. Cooling and lubrication. 2h
Unit 7. The combustion process in the ICE. 2h
Unit 8. The process of escape. Emissions. 4h
Unit 9. Auxiliary systems in the ICE. Feeding and ignition. 5h
Unit 10. Cogeneration with heat engines. 1h

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

T1IM – Knowledge of heat engines. Basic principles and their applications as elements of mechanical energy generation.

T2IM – Knowledge of auxiliary systems of ICE.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100

E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	0

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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 MECHANICAL ENGINEERING III
5.5.1 Core Information Level 1
LEVEL 2: ELASTICITY AND RESISTANCE OF MATERIALS
5.5.1.1 Core Information Level 2

TYPE	REQUIRED
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: THEORY OF STRUCTURES AND INDUSTRIAL BUILDINGS
5.5.1.1.1 Core Information Level 3

TYPE	ECTS SUBJECT	DURATION
REQUIRED	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 calculation of structures.
Structures with articulated knots.
Matrix calculation of structures: general concepts.
Rigidity method of matrix calculation.
Dynamic analysis of structures.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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

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

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

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

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

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
E4IM – Knowledge and skills to apply the fundaments of elasticity and resistance of materials to the behaviour of real solids.
E5IM – Knowledge and ability to analysis and design of structures and industrial buildings.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS

In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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: CALCULATION AND DESIGN OF STRUCTURES

5.5.1.1 Core Information Level 2

TYPE	REQUIRED
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: METALLIC STRUCTURES		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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		

Unit 1: The steel as a building material.

Unit 2: Traction, flexion and torsion in thin-walled sections.

Unit 3: Possible instabilities in steel structures.

Unit 4: Depletion of sections due to plasticizing: section classification

Unit 5: Structural analysis: global lateral stability.

Unit 6: Ultimate limit state: resistance of sections.

Unit 7: U.L.S.[18] bar resistance: traction / compression. composite parts

Unit 8: U.L.S. bar resistance: flexion and effort interaction. dent.

Unit 9: Joints.

Unit 10: Service limite state sls, execution, tolerances and quality control

Unit 11: Fire protection.

5.5.1.4 OBSERVATIONS

[18] ULS: Ultimate limit state. Estado Límte Último: ELU.

5.5.1.5 COMPETENCIES
5.5.1.5.1 CORE AND GENERAL COMPETENCIES
A1 – Ability to write, sign and develop projects in the field of industrial engineering which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energy facilities, electrical and electronic installations, installations and industrial plants and manufacturing-automation processes.
A2 – Ability for the management of the activities of engineering projects described in the previous section.
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.
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.
CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
E4IM – Knowledge and skills to apply the fundaments of elasticity and resistance of materials to the behaviour of real solids.
E5IM – Knowledge and ability to analysis and design of structures and industrial buildings.

5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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.		100.0

LEVEL 2: STRUCTURES		
5.5.1.1 Core Information Level 2		
TYPE	REQUIRED	
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: CONCRETE STRUCTURES		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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

Part I: Structural Concrete Technology.

Introduction.

Materials Technology.

Bases of calculation and safety of concrete structures.

Part II: Calculations relating to the limit states.

Ultimate limit state of depletion against starndard solicitations.

Ultimate limit state of depletion due to shear stress.

Ultimate limit state of depletion due to shear failure.

Ultimate limit state of depletion due to torsion.

Ultimate limit state of instability.

Limit state of use due to cracking.

Limit state of use due to deformations.

Part III: Execution and control.

Steel reinforcement.

Part IV: structural elements

Beams.

Holders

Ironworks.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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

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

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

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

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

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

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

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

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
B3 – Basic knowledge on using and programming computers, operating systems, databases and software with 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.
T8IM - Knowledge and skills to tackle the design, calculation and execution of concrete structures.
5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).
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 practice, 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 MECHANICAL ENGINEERING IV
5.5.1 Core Information Level 1
LEVEL 2: MATERIALS SCIENCE
5.5.1.1 Core Information Level 2

TYPE	REQUIRED

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: MATERIALS TECNOLOGY		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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		

Unit 1: Inspection techniques in materials.
Unit 2: Obtaining and treating of materials techniques.
Unit 3: Behaviour in service.
Unit 4: Materials engineering.
Unit 5: Recycling and appraisal of materials.

5.5.1.4 OBSERVATIONS
5.5.1.5 COMPETENCIES
5.5.1.5.1 CORE AND GENERAL COMPETENCIES
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.
CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
No data

5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OUT OF GRADES):	0.0	100.0

In-class test: two hours minimum – four hours maximum.		
LEVEL 2: MANUFACTURING TECHNOLOGY		
5.5.1.1 Core Information Level 2		
TYPE	REQUIRED	
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: MANUFACTURING TECHNOLOGY		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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		
Unit 1: Introduction to systems and processes of mechanical manufacturing.		

Unit 2: Metrology.

Unit 3: Forming by moulding.

Unit 4: Forming by plastic deformation.

Unit 5: Forming by assembling parts.

Unit 6: Non conventional processes.

Unit 7: Forming by machining.

Unit 8: Friction, cutting fluids and tool life.

Unit 9: Technological aspects of machining.

Unit 10: Machining with abrasives.

Unit 11: Automation in machining.

Unit 12: Introduction to numerical control of machine-tools.

Unit 13: Programming machine-tools of numerical control.

Unit 14: Flexible manufacturing systems.

Unit 15: Quality control in manufacturing.

- Control of dimensions.
- Sand casting.
- Forming of sheet metal.
- Brazing/soldering of copper conduction.
- Oxyacetylene welding.
- Arc welding by coated electrodes.
- Parallel lathe Machining.
- Machining with universal milling machine.
- CNC lathe Programming.
- Programming of CNC milling.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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

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

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

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

A7 – Ability to 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.

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
E8IM – Applied knowledge of systems and manufacturing processes, metrology and quality control.
5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).
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 practice, 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
5.5.1.1 Core Information Level 2

TYPE	REQUIRED
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: METROLOGY AND QUALITY		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
REQUIRED	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		

Unit 1: Introduction to Metrology. Systems of measurement units.
Unit 2: Normalization.
Unit 3: Metrology laboratory.
Unit 4: Uncertainty of measurement.
Unit 5: measuring instruments. Measuring methods.
Unit 6: Interferometry.
Unit 7: length Patterns.
Unit 8: Instruments for the direct lengths measurement.
Unit 9: length Comparators and verifiers.
Unit 10: Control of angles.
Unit 11: Dimensional tolerances.
Unit 12: Unit Settings.
Unit 13: Shape Metrology.
Unit 14: Rugosity.

Unit 15: Certification and accreditation.
Unit 16: Quality systems.
Unit 17: Process control and acceptance.
Unit 18: Integration of quality in manufacturing systems.

- Approach to a laboratory of dimensional metrology.
- Employment of length patterns
- Methods and tools for direct measurement of lengths and angles.
- Methods and tools for indirect measurement of lengths and angles.
- Using a profile projector.
- Measurement software.
- Using a co-ordinate measuring machine.
- Using a Surface Roughness Tester for characterizing surface quality.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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

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

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

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

A8 – Ability to apply principles and methods of quality.

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

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

T3IM – Additional knowledge of metrology, calibration and accreditation.

T4IM – Ability to implement systems in manufacturing, advanced techniques of quality control and normalization.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY

IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS

In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).

In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).

In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).

E-Learning classes: PERSONAL STUDY.

In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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: MECHANICAL ENGINEERING

5.5.1.1 Core Information Level 2

TYPE	OPTIONAL
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: MOTOR VEHICLE ENGINEERING		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
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		

Unit 1. Introduction. Components and systems in vehicles. Regulations.

Unit 2. Structure and Bodywork. Resistant structure of vehicles.

Unit 3. Aerodynamics. Notions of vehicle aerodynamics.

Unit 4. Tyres. General features. Structure.

Unit 5. Traction system. Resistance to movement. motion Equation. Features. Transmission systems.

Unit 6. Braking system. Design for optimum braking: brake curves. Types of car brakes, advantages and disadvantages. Brake circuits. Power braking system.

Unit 7. Steering system. Directional characteristics in steady state. Simplified modelling of turning maneuvre.

Directional stability. Steering geometry. Steering mechanisms. Power steering.

Unit 8. Suspension System. suspension Elastic damping elements. Suspension design of a car: safety and comfort. suspension Kinematics. Suspension systems in motor vehicles: advantages and disadvantages.

Unit 9. Elements of passive safety. Seat belts. Airbag systems. Seats. Planned and reinforced structures.

Unit 10. Safety and comfort servo systems. Common Sensors in motor vehicles. Electronic monitoring of operating behaviour.

- Traction System. Transmission identification.
- Braking System. Identification system.
- Management System. Identification system.
- Suspension System. Identification of components. Verification status of a vehicle suspension

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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

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

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

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

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

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

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

E2IM – Knowledge and skills for calculation, design and testing machines.

E4IM – Knowledge and skills to apply the fundaments of elasticity and resistance of materials to the behaviour of real solids.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS

In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).

In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).

In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).

E-Learning classes: PERSONAL STUDY.

In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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.		100.0

LEVEL 2: STRUCTURES		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
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: SOIL MECHANICS AND FOUNDATIONS		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
ECTS Semester 7	ECTS Semester 8	ECTS Semester 9
6		
ECTS Semester 10	ECTS Semester 11	ECTS Semester 12
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	CATALAN	BASQUE
Yes	No	No

GALICIAN	VALENCIAN	ENGLISH
No	No	No
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	

LIST OF MENTIONS

No data

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Soil types.
Total and effective pressure.
Mohr circle applied to foundation.
Consolidation theory.
Edometric cutting, compression, triaxial trials.
Active earth preassure.
Foundation design.
Collapsing loads.
Geotechnical results analysis.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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

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

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

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

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

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

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

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

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
B3 – Basic knowledge on using and programming computers, operating systems, databases and software with 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.
E5IM – Knowledge and ability to analysis and design of structures and industrial buildings.
OIM1 – Knowledge and skills to apply the methods of soil mechanics.
OIM2 – Knowledge and skills for the design, calculation and executions of foundations of structures.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	0
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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: RENEWABLE ENERGY AND ENERGY EFFICIENCY

5.5.1.1 Core Information Level 2

TYPE	OPTIONAL
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: RENEWABLE ENERGY AND ENERGY EFFICIENCY		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
ECTS Semester 7	ECTS Semester 8	ECTS Semester 9
	6	
ECTS Semester 10	ECTS Semester 11	ECTS Semester 12
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	CATALAN	BASQUE
Yes	No	No
GALICIAN	VALENCIAN	ENGLISH
No	No	No
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	
LIST OF MENTIONS		
No data		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		

Unit 1. Introduction to renewable energy.

Unit 2. Treatment of solar radiation.

Unit 3. Solar thermal collectors.

Unit 4. Calculation and design of thermal installations by solar energy.

Unit 5. Photovoltaic systems. The solar cell. The photovoltaic generator.

Unit 6. Dimensioning of autonomous photovoltaic systems.

Unit 7. Wind energy study.

Unit 8. Description of wind machines. Wind machines Design.

Unit 9. Other sources for obtaining renewable energies.

Unit 10. Applicable regulations and legislation of energy efficiency.

Unit 11. Energy efficiency in lightning installations.

Unit 12. Energetic limitation according to the technical building code.

Unit 13. Classification and energy certification of buildings.

Unit 14. Efficiency and energy saving in the industrial sector.

Practice 1. Calculation of solar radiation at ground-level.
Practice 2. Modelling of a flat solar thermal collector.
Practice 3. Solar thermal installation of low temperature design.
Practice 4. Photovoltaic solar installation design.
Practice 5. Calculation of energy classification and certification of a building.

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5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

OMI3 – Knowledge of renewable energy and energy efficiency.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS

In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).

In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).

In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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.		100.0

LEVEL 2: MANUFACTURING		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
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: WELDING		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
ECTS Semester 7	ECTS Semester 8	ECTS Semester 9

	6	
ECTS Semester 10	ECTS Semester 11	ECTS Semester 12
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	CATALAN	BASQUE
Yes	No	No
GALICIAN	VALENCIAN	ENGLISH
No	No	No
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	
LIST OF MENTIONS		
No data		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		

Unit 1. Introduction to welding.
Unit 2. Symbolization of welding.
Unit 3. Brazing and soldering.
Unit 4. Gas welding.
Unit 5. Welding by resistance.
Unit 6. Arc welding.
Unit 7. Arc welding by means of coated electrodes.
Unit 8. Arc welding with protective gas.
Unit 9. Other welding processes by fusion.
Unit 10. Welding without fusion.
Unit 11. Introduction to welding metallurgy.
Unit 12. Weldability of conventional steels.
Unit 13. Weldability of special steels.
Unit 14. Weldability of foundries.
Unit 15. Weldability of light alloys.
Unit 16. Tensional aspects in welded joints.
Unit 17. Calculation of welded joints methods.
Unit 18. Pathologies of welded joints.
Unit 19. Welding control.
Unit 20. Welders degree.
Unit 21. Welding safety.

- Edge preparations.
- Brazing and soldering of copper conductions.
- Spot welding plates by electrical resistance.
- Oxyacetylene welding.
- Oxicut.

Arc welding with coated electrodes.
- TIG[19] Welding.
- MIG- MAG[20] welding.
- Plasma cutting.

[19] TIG: Tungsten inert gas.

[20] MIG-MAG: Metal Inert Gast - Metal Active Gas.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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

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

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

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

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

A9 – Ability to organize and planning in the field of business and other institutions and organizations.

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

OMI4 – Scientific and technological knowledge on welding procedures, metallurgical aspects, inspection and calculation of welded joints.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS

In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).

In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).

In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).

E-Learning classes: PERSONAL STUDY.

In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).		
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 practice, 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: MATERIALS		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
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: CONSTRUCTION MATERIALS		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
	6	
ECTS Semester 7	ECTS Semester 8	ECTS Semester 9
ECTS Semester 10	ECTS Semester 11	ECTS Semester 12
OFFERED IN THE FOLLOWING LANGUAGES		

SPANISH	CATALAN	BASQUE
Yes	No	No
GALICIAN	VALENCIAN	ENGLISH
No	No	No
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	

LIST OF MENTIONS
No data

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS
Unit 1. Introduction. Regulations. Unit 2. General and specific properties. Unit 3. Rocks and stones. Natural stone materials. Unit 4. Ceramic materials. Unit 5. Gypsum. Unit 6. Lime. Unit 7. Cements. Unit 8. Concrete. Unit 9. Structural metallic materials. Unit 10. No structural metallic materials. Unit 11. Timber. Unit 12. Insulating materials. Unit 13. Glasses. Unit 14. Plastics. Unit 15. Organic agglomerates. Tema 16. Varnishes and paints.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES
5.5.1.5.1 CORE AND GENERAL COMPETENCIES
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.
CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
OIM5 – Knowledge and ability to understand the theoretical behaviour of materials used in construction.
OIM6 – Application of building materials and construction elements.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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 ENGLISH

5.5.1.1 Core Information Level 2

TYPE	OPTIONAL
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
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 MECHANICAL ENGINEERING		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
6		
ECTS Semester 7	ECTS Semester 8	ECTS Semester 9
ECTS Semester 10	ECTS Semester 11	ECTS Semester 12
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	CATALAN	BASQUE
No	No	No
GALICIAN	VALENCIAN	ENGLISH
No	No	Yes
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	
LIST OF MENTIONS		
No data		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Unit 1: Nominal groups. Extensive reading: Heat transfer: Conduction. Speaking: Micro Text. Unit 2: Verb tenses. Extensive reading: Heat transfer: Convection. Speaking: Micro Text. Unit 3: Relative clauses. Extensive reading: The Principle of transmissibility. Speaking: Micro Text. Unit 4: Lexis: Word formation. Extensive reading: Flamecutting. Speaking: Micro Text. Unit 5: Expressing logical relations. Writing: Text organization. Speaking: Micro Text. Unit 6: Expressing suasion and intellectual attitudes. Writing: Writing from sketches. Speaking: Micro Text. Unit 7: Giving factual information. Writing: C. V., application letter. Speaking: Micro Text. Unit 8: Scientific symbols, signs and expressions. Writing: Reports and abstracts. Speaking.		
5.5.1.4 OBSERVATIONS		
5.5.1.5 COMPETENCIES		
5.5.1.5.1 CORE AND GENERAL COMPETENCIES		
A10 – Ability to work in a multilingual and multidisciplinary environment.		

5.5.1.5.2 CROSS-CURRICULUM		
No data		
5.5.1.5.3 SPECIFIC		
No data		
5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100
5.5.1.7 TEACHING METHODS		
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).		
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).		
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).		
E-Learning classes: PERSONAL STUDY.		
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).		
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 practice, 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: HEALTH AND SAFETY		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
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: OCCUPATIONAL HEALTH AND SAFETY		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
ECTS Semester 7	ECTS Semester 8	ECTS Semester 9
	6	
ECTS Semester 10	ECTS Semester 11	ECTS Semester 12
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	CATALAN	BASQUE
Yes	No	No
GALICIAN	VALENCIAN	ENGLISH
No	No	No
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	
LIST OF MENTIONS		
No data		
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
Accident Investigation.
Individual and collective protection.
Introduction to occupational health: assessment and risk valuation of hygiene.
Basics of working toxicology.
Chemical agents.
Physical agents, noise and thermal environment.
Physical agents, ionizing and non-ionizing radiation.
Biological agents. Toxic and dangerous waste.
Introduction to ergonomics: analysis of working conditions.
Basic concepts on working 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 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

OIM7 - Ability to apply the principles of the health and safety at Work, techniques for assessing the risks of accidents, measures and adequate means for their prevention.

OIM8 - To know the means of collective and individual protection.

OIM9 - To understand the significance and need for safe working conditions.

OIM10 - To know the responsibilities of the occurrence of accidents, features and methods in solving working disputes.

OIM11 - To know in detail the basics of safety inspection and accident investigation. Methodology and implementation.

OIM12 - To know the different types of reporting accidents.

OIM13 – To understand the risk assessment of a company and its preventive measures.

OIM14 – To know how to calculate and interpret statistical indices of most common accidents and perform critically an evaluation of them.

OIM15 - To know the basics of scientific documentation and information sources in industrial hygiene. Knowledge of the fundamentals of the research of occupational diseases.

OIM16 - To know the main hygiene, physical, chemical and biological risks.

OIM17 - To know the pollutants in hospitals and the mechanisms of evolution, control and their prevention.

OIM18 - To know the basics of ergonomics, objectives, branches and its usefulness in prevention.

OIM19 - Basic knowledge of first aid at company level.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0

ASSESSMENT	15	100
5.5.1.7 TEACHING METHODS		
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).		
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).		
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).		
E-Learning classes: PERSONAL STUDY.		
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).		
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 practice, 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.		100.0
LEVEL 2: COMPUTING		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
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: COMPUTING SYSTEMS		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTIONAL	6	Semester

DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
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
1. Databases. 2. Scientific programming using Matlab. 3. Visual programming.
5.5.1.4 OBSERVATIONS
5.5.1.5 COMPETENCIES
5.5.1.5.1 CORE AND GENERAL COMPETENCIES
A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
OIM20 - Knowledge and ability to apply knowledge of databases.
OIM21 - Basic knowledge of computer systems and programming aimed at industrial applications.
OIM23 - Basic knowledge of visual programming.
5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).

In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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	OPTIONAL
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: EXTENSION OF PHYSICS

5.5.1.1.1 Core Information Level 3

TYPE	ECTS SUBJECT	DURATION
OPTIONAL	6	Semester

DURATION

ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
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

Block 1. Fundamentals of Modern Physics.
Block 2. Structure of matter.
Block 3. Properties of matter.
Block 4. Optics and acoustics.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

OIM24 - Knowledge of technological applications which have been developed from the principles of contemporary physics.

OIM37 - Ability to design and improve technological devices through the knowledge of operating physical laws.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS

In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).

In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).

In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).

E-Learning classes: PERSONAL STUDY.

In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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: INDUSTRIAL ORGANIZATION

5.5.1.1 Core Information Level 2

TYPE	OPTIONAL
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
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
	6	
ECTS Semester 7	ECTS Semester 8	ECTS Semester 9
ECTS Semester 10	ECTS Semester 11	ECTS Semester 12
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	CATALAN	BASQUE
Yes	No	No
GALICIAN	VALENCIAN	ENGLISH
No	No	No
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	
LIST OF MENTIONS		
No data		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		

Total planning and master programming.

Materials management: buy and acquisition of inventories.

Inventory control.

Material requirements planning.

Programming and control of production activities.

Project management.

Quality control.

Maintenance and reliability.

Functions of operations management.

Location of facilities.

Design, capacity and distribution of the facilities.

Process planning and analysis.

Design and work measurement.

5.5.1.4 OBSERVATIONS
5.5.1.5 COMPETENCIES
5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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 organize and planning in the field of business and other institutions and organizations.
A11 – Knowledge, understanding and ability to apply the necessary legislation in the exercise of the profession of Engineer.
CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
OIM26 - Knowledge, understanding and ability to design and manage production systems and industrial operations.
OIM27 - Basic knowledge and application of environmental technologies and sustainability.
OIM28 - Applied knowledge of business organization in industrial operations.
OIM29 - Knowledge and ability to organize, manage and control projects.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, personal work, follow-up exams.	0.0	100.0

FINAL EXAM (BETWEEN 20% AND 0.0 80% OUT OF GRADES): In-class test: two hours minimum – four hours maximum.		100.0
LEVEL 2: STRUCTURES		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
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		
NIVEL 3: ASSISTED STRUCTURAL DESIGN AND ANALYSIS		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
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 information. Loads acting on structures. Structural requirements. Structural materials. Cables and membranes. Triangulated structural systems. Reticulated structural systems. Laminar structural systems. Porticoed structural systems. Mobile structural systems. FEM[21] : 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 COMPETENCIES
5.5.1.5.1 CORE AND GENERAL COMPETENCIES
A1 – Ability to write, sign and develop projects in the field of industrial engineering which aim, according to the knowledge acquired as basic skills training, common in the industrial and technological industry, construction, alteration, repair, conservation, demolition, manufacture, assembly, installation or operation of: structures, mechanical equipment, energy facilities, electrical and electronic installations, installations and industrial plants and manufacturing-automation processes.
A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.
A5 – Knowledge to perform measurements, calculations, assessments, appraisals, expert calculations, studies, reports, work plans and similar work.
CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC

[21] FEM: Finite element method. MEF: Método de elementos finitos.

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 resistance of materials.

5.5.1.6 LEARNING ACTIVITIES		
LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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: INDUSTRIAL MAINTENANCE	
5.5.1.1 Core Information Level 2	
TYPE	OPTIONAL
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 MAINTENANCE		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
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		

Unit 1. Preventive and predictive maintenance techniques.

Unit 2. Failure study.

Unit 3. Organization of maintenance in industry.

1. Maintenance management assisted by computer.
2. Industrial instrumentation (data acquisition systems and sensors).
3. Vibration analysis: Severity of vibration and spectral analysis of vibrations.
4. Basic techniques of reparation: Balance and alignement.

5.5.1.4 OBSERVATIONS
5.5.1.5 COMPETENCIES
5.5.1.5.1 CORE AND GENERAL COMPETENCIES
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 organize and planning in the field of business and other institutions and organizations.
A10 – Ability to work in a multilingual and multidisciplinary environment.
CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
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 mechanisms theory.
C8 – Knowledge and use of the principles of resistance of materials.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
In-Person classes: ACTIVITIES OUTSIDE THE UNIVERSITY (CLINICAL PRACTICE, IN INSTITUTIONS, IN COMPANIES, FIELDWORKS, VISITS TO CENTERS/INSTITUTIONS…).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, personal work, follow-up exams.	0.0	100.0
FINAL EXAM (BETWEEN 20% AND 80% OUT OF GRADES):	0.0	100.0

In-class test: two hours minimum – four hours maximum.		
LEVEL 2: INDUSTRIAL AUTOMATION		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
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		
NIVEL 3: INDUSTRIAL ROBOTS PROGRAMMING		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
	6	
ECTS Semester 7	ECTS Semester 8	ECTS Semester 9
ECTS Semester 10	ECTS Semester 11	ECTS Semester 12
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	CATALAN	BASQUE
Yes	No	No
GALICIAN	VALENCIAN	ENGLISH
No	No	No
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	
LIST OF MENTIONS		

No data

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

The aim of this subject is to design applications with industrial robots. To do this, we start modelling industrial robots to facilitate the subsequent application design. The characteristics of the programming of industrial robots and applications design techniques are studied. 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 programming. Specific programming languages. Programming of industrial robots Application. Types of applications. Design and programming applications. Industrial robots Implementation. Robots Integration. Safety.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

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

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

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

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

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

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

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

No data

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0

ASSESSMENT	15	100
5.5.1.7 TEACHING METHODS		
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).		
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).		
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).		
E-Learning classes: PERSONAL STUDY.		
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).		
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 practice, 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: ELECTRICITY		
5.5.1.1 Core Information Level 2		
TYPE	OPTIONAL	
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		
NIVEL 3: LIGHTING TECHNIQUES AND DOMOTICS		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTIONAL	6	Semester

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

OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	CATALAN	BASQUE
Yes	No	No
GALICIAN	VALENCIAN	ENGLISH
No	No	No
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	

LIST OF MENTIONS
No data

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

Unit 1: Basic factors in lighting.
Unit 2: Quantities and units used in lightning.
Unit 3: Graphics and diagrams of lightning.
Unit 4: Reflection, absorption and light transmission.
Unit 5: Technological aspects of incandescent lamps.
Unit 6: Discharge lamps (I).
Unit 7: Discharge lamps (II).
Unit 8: Indoor lightning project.
Unit 9: Outdoor lightning project.
Unit 10: Principles of public illumination.
Unit 11: Basic considerations in the calculation of public illumination.
Unit 12: Power and control of lightning facilities.

Unit 1: General introduction.
Unit 2: What is meant by domotics?
Unit 3: Features of automation market.
Unit 4: User requirements.
Unit 5 Setting of a home automation system.
Unit 6: Applications of domotics.
Unit 7: Building conditioning for domotic building.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
C4 – Knowledge and use of the principles of circuit theory and electrical machines.
E4IM – Knowledge and skills to apply the fundaments of elasticity and resistance of materials to the behaviour of real solids.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, 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: ELECTRÓNICS

5.5.1.1 Core Information Level 2

TYPE	OPTIONAL
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		
NIVEL 3: ELECTRONIC MEASUREMENT EQUIPMENT		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
OPTIONAL	6	Semester
DURATION		
ECTS Semester 1	ECTS Semester 2	ECTS Semester 3
ECTS Semester 4	ECTS Semester 5	ECTS Semester 6
ECTS Semester 7	ECTS Semester 8	ECTS Semester 9
6		
ECTS Semester 10	ECTS Semester 11	ECTS Semester 12
OFFERED IN THE FOLLOWING LANGUAGES		
SPANISH	CATALAN	BASQUE
Yes	No	No
GALICIAN	VALENCIAN	ENGLISH
No	No	No
FRENCH	GERMAN	PORTUGUESE
No	No	No
ITALIAN	OTHER	
No	No	
LIST OF MENTIONS		
No data		
5.5.1.2 LEARNING RESULTS		
5.5.1.3 CONTENTS		
Unit 1: Measurement systems implementations. Unit 2: Programmes for implementation based on Pcs. Two practices will be performed on PCs environment with management data acquisition cards and / or data acquisition modules.		
5.5.1.4 OBSERVATIONS		

5.5.1.5 COMPETENCIES
5.5.1.5.1 CORE AND GENERAL COMPETENCIES
A3 – Knowledge in basic and technological subjects, to enable them to learn new methods and theories, and provide them versatility to adapt to new situations.
A4 – Ability to solve problems with initiative, decision, creativity, critical thinking and to communicate and impart knowledge and skills/abilities in the field of Industrial Engineering.
A5 – Knowledge to perform measurements, calculations, assessments, appraisals, expert calculations, studies, reports, work plans and similar work.
A6 – Ability to handle specifications, regulations and mandatory rules.
A10 – Ability to work in a multilingual and multidisciplinary environment.
CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.
5.5.1.5.2 CROSS-CURRICULUM
No data
5.5.1.5.3 SPECIFIC
OIM1 – Knowledge and skills to apply the methods of soil mechanics.
OIM31 - Ability to design electronic systems and industrial instrumentation.
OIM32 - Ability to manage electronic instrumentation based on PC.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	60	100
E- LEARNING ACTIVITIES	75	0
ASSESSMENT	15	100

5.5.1.7 TEACHING METHODS
In-Person classes: EXPOSITIVE ACTIVITIES (MASTERCLASS, CONFERENCE, TALK...).
In-Person classes: PRACTICE ACTIVITIES IN CLASSROOM (PROBLEMS, DESIGN ACTIVITIES, SIMULATION PRACTICE, TECHNICAL REPORTS, BIBLIOGRAPHIC REVISION, ETC).
In-Person classes: PRACTICE ACTIVITIES IN SPECIFIC FACILITIES (LABORATORY PRACTICE, IN COMPUTER ROOMS, IN LANGUAGE CLASSROOMS, IN AUDIOVISUAL CLASSROOMS, IN WORKSHOPS...).
E-Learning classes: PERSONAL STUDY.
In-Person classes: ASSESSMENT ACTIVITIES (PARTIAL AND FINAL EXAMS, SELF ASSESSMENTS, ESSAYS AND PROJECTS, PARTICIPATION IN CLASS…).

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 practice, personal work, follow-up exams.	0.0	100.0

FINAL EXAM (BETWEEN 20% AND 0.0 80% OUT OF GRADES): In-class test: two hours minimum – four hours maximum.		100.0
5.5 LEVEL 1: FINAL PROJECT		
5.5.1 Core Information Level 1		
LEVEL 2: FINAL PROJECT		
5.5.1.1 Core Information Level 2		
TYPE	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	PORTUGUESEE
No	No	No
ITALIAN	OTHERS	
No	No	
NIVEL 3: FINAL PROJECT		
5.5.1.1.1 Core Information Level 3		
TYPE	ECTS SUBJECT	DURATION
FINAL PROJECT	12	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
	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	PORTUGUESEE
No	No	No
ITALIAN	OTHER	
No	No	

5.5.1.2 LEARNING RESULTS

5.5.1.3 CONTENTS

End of degree project.

5.5.1.4 OBSERVATIONS

5.5.1.5 COMPETENCIES

5.5.1.5.1 CORE AND GENERAL COMPETENCIES

CC1 – Prove students 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 competencies 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 – Prove students have developed those learning skills necessary to undertake further studies with a high autonomous learning process.

5.5.1.5.2 CROSS-CURRICULUM

No data

5.5.1.5.3 SPECIFIC

EDP - Exercise to be performed individually and present and defend in front of a examination board, this is a project in the field of specific technologies of industrial engineering professional nature in which synthesize and integrate the competencies/skills acquired in the degree teachings.

5.5.1.6 LEARNING ACTIVITIES

LEARNING ACTIVITY	HOURS	PRESENTIALITY
IN-PERSON LEARNING ACTIVITIES	4	100
E- LEARNING ACTIVITIES	295	0
ASSESSMENT	1	100

5.5.1.7 TEACHING METHODS

In-Person classes: TUTORING.

In-Person classes: ASSESSMENT ACTIVITIES (END OF DEGREE PROJECT)

E-Learning classes: PERSONAL STUDY.

5.5.1.8 ASSESSMENT SYSTEMS

ASSESSMENT SYSTEM	MINIMAL ASSESSMENT	MAXIMAL ASSESSMENT
DEFENSE OF THE FINAL DEGREE PROJECT IN FRONT OF AN EXAMINING BOARD.	0.0	100.0

6. ACADEMIC PERSONNEL

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

ACADEMIC PERSONNEL
See annex, paragraph 6
6.2 OTROS RECURSOS HUMANOS
See annex, paragraph 6.2

7. MATERIAL RESOURCES AND SERVICES

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

8. EXPECTED RESULTS

8.1 QUANTITATIVE VALUES ESTIMATION		
GRADUATION RATE %	DROPOUT RATE %	EFICIENCY RATE %
12	30	60
CODE	RATE	VALUE %
No data		
Vindication of proposed indicators:		
See annex, paragraph 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 Center. This program should include the Syllabus of each of the relevant subjects, and this will incorporate the evaluation system of the students 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 process 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 competencies 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/contenidos/general.action?idselectedsection=2&selectedsection=Conoce%20la%20EPS&parentmenu=Garant%EDa%20de%20la%20Calidad&submenu=Manual%20Sistema%20de%20Calidad&idpage=205

10. IMPLEMENTATION CALENDAR

10.1 IMPLEMENTATION TIMELINE	
COURSE ENTRY	2010

See annex, paragraph 10.

10.2 ADAPTATION PROCEDURE

REGULATION RULES OF THE ADAPTATION SYSTEM OF THE DEGREE 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.

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

2. 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.

3. 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 and activities, and working and professional experience, in order to obtain official university Degrees and Masters, as well as transfer credits" approved by the Governing Council of the University of Malaga, June 23rd, 2011.

Article 3. Expiration Procedures of Syllabus.

1. 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.

2. 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.

3. 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. Specialty in Mechanics.	Graduate in Mechanical Engineering from the University of Malaga
Algebra	Linera Algebra
Calculus	Caculus
Further Mathematics	Further Calculus
Mechanics	Physics I
Physical fundamentals of mechanical engineering	Physics II
Fundamentals of Computing	Fundamentals of Computing
Chemistry applied to mechanical engineering	Chemistry
Further physics of mechanical engineering	Further Physics
Graphical expression and computer aided design	Graphical expression in Engineering
Business Management and production organisation	Business management

Thermodynamics	Thermotechnics
Engineering Fluid Mechanics	Fluid Mechanics
Fundamentals of materials science	Materials science
Fundamentals of electrical technology	Fundamentals of electrical engineering
Mechanical systems / mechanism theory	Machine theory
Elasticity and resistance of materials	Resistance of materials
Technical office	Technical office
Graphical expression and computer aided design	Computer aided mechanical design
Machines design	Machines design and calculus
Thermal engineering II	Thermal engineering
Theory of structures and industrial buildings	Theory of structures and industrial buildings
Metallic structures	Metallic structures
Experimental techniques in fluid and termal machines	Fluid mechanics machines
Mechanical technology	Manufacturing technology
Topography and construction drawing	Graphic Mechanical Engineering and Topography
Quality technology	Metrology and Quality
Advanced Machine Design	Experimental Mechanics and Machine simulation techniques
Concrete structures	Concrete structures
Thermal engineering I	Heat engines
Computer aided design, manufacturing and machine tests	Experimental Mechanics and Machine simulation techniques
Foundations	Soil mechanics and foundations
Renewable energies	Renewable energies y energy efficiency
Manufacturing technology	Welding
Building materials	Building materials
Technical English I	English applied to mechanical engineering
Health and safety at work	Ocupational safety and health
Quality Management, Planning and Control	Operations management
Vehicles	Industrial maintenance
Experimental techniques in electrical engineering	Lighting techniques and domotics
Statistical methods in engineering	Vector and statistical analysis

10.3 STUDIES BEING PHASED OUT

CODE	ESTUDIO - CENTER
5095000-29009119	Technical Industrial Engineering, specialty Mechanical- Higher Polytechnic School

11. PERSONS ASSOCIATED WITH THE APPLICATION

11.1 RESPONSIBLE FOR DEGREE

NIF	NAME	LAST NAME 1	LAST NAME 2
33381949W	Alejandro	Rodríguez	Gómez
ADDRESS	**POSTAL CODE**	**PROVINCE**	**TOWNSHIP**
Campus Universitario de Teatinos. HIGHER POLYTECHNIC SCHOOL	29071	Málaga	Málaga
EMAIL	**PHONE**	**FAX**	**CHARGE**
arodriguez@uma.es	952131038	952132694	DEAN OF HIGHER POLYTECHNIC SCHOOL

11.2 LEGAL REPRESENTATIVE

NIF	NAME	LAST NAME 1	LAST NAME 2
25084614D	MARIA JOSE	BLANCA	MENA
ADDRESS	**POSTAL CODE**	**PROVINCE**	**TOWNSHIP**
C/ El Ejido s/n. PABELLÓN DE GOBIERNO DE LA UNIVERSIDAD DE MÁLAGA	29071	Málaga	Málaga
EMAIL	**PHONE**	**FAX**	**CHARGE**

blamen@uma.es	952131038	952132694	VICE-RECTOR OF ACADEMIC ORDINANCE AND FACULTY

11.3 APPLICANT			
Responsible for degree is not the applicant			
NIF	NAME	LAST NAME 1	LAST NAME 2
25084614D	MARIA JOSE	BLANCA	MENA
ADDRESS	POSTAL CODE	PROVINCE	TOWNSHIP
C/ El Ejido s/n. PABELLÓN DE GOBIERNO DE LA UNIVERSIDAD DE MÁLAGA	29071	Málaga	Málaga
EMAIL	PHONE	FAX	CHARGE
blamen@uma.es	952131038	952132694	VICE-RECTOR OF ACADEMIC ORDINANCE AND FACULTY AT THE UNIVERSIDAD OF MÁLAGA

ANNEXES : PARAGRAPH 2

Nombre : 2 JUSTIFICA INGENIERIA MECANICA.pdf

HASH MD5 : 6f051c22d2052d82926f22bc720a95f9

Tamaño : 302516

2 JUSTIFICA INGENIERIA MECANICA.pdf

ANNEXES : PARAGRAPH 3

Nombre : APARTADO_4.1_INGENIERIA_MECANICA.pdf

HASH MD5 : 87ce52bb337d9bc99047efecef4fcdb2

Tamaño : 58016

APARTADO_4.1_INGENIERIA_MECANICA.pdf

ANNEXES : PARAGRAPH 5

Nombre : APARTADO_5.1._PLAN DE ESTUDIOS_ING_MEC.pdf

HASH MD5 : fbe0b4db10813ffb6546d767692003e1

Tamaño : 36410

APARTADO_5.1._PLAN DE ESTUDIOS_ING_MEC.pdf

ANNEXES : PARAGRAPH 6

Nombre : 6. RRH PDI.pdf

HASH MD5 : a066af50f12f745107140dc5718ceaff

Tamaño : 92226

6. RRH PDI.pdf

ANNEXES : PARAGRAPH 7

Nombre : APARTADO_7_RECURSOS MATERIALES.pdf

HASH MD5 : 13f97a03f4b837943b7678f2d8d63f9a

Tamaño : 295336

APARTADO_7_RECURSOS MATERIALES.pdf

ANNEXES : PARAGRAPH 8

Nombre : 8 ING MECANICA JUSTIFICA TASAS.pdf

HASH MD5 : cbfef8c2950699db4c3a8a65f56b2c83

Tamaño : 38221

8 ING MECANICA JUSTIFICA TASAS.pdf

ANNEXES : PARAGRAPH 10

Nombre : APARTADO_10_1_ING. MECÁNICA.pdf

HASH MD5 : bbbe994a5fb832b1b15f3331788e1845

Tamaño : 107506

APARTADO_10_1_ING. MECÁNICA.pdf

ANNEXES : PARAGRAPH 11

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

HASH MD5 : 150faeaf4e41e73aba064cae30be88ec

Tamaño : 114367

DELEGACION FIRMA _ [Maria Jose Blanca Mena].pdf