ASIIN Accreditation Report

Bachelor's Degree Programmes

Civil Engineering
Construction Engineering
Geological Engineering

Master's Degree Programme

University Master Civil Engineering
Numerical Methods of Engineering

Provided by
Universitat Politècnica de Catalunya, Barcelona

Version: 27 March 2015

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A About the Accreditation Process

Title of the degree programme	Labels applied for [1]	Previous accreditation	Involved Technical Committees (TC)[2]
Bachelor's degree programme of Civil Engineering	ASIIN, EUR-ACE® Label	Yes (by ANECA and AQU Catalunya)	TC 03
Bachelor's degree programme of Construction Engineering	ASIIN, EUR-ACE® Label	Yes (by ANECA and AQU Catalunya)	TC 03
Bachelor's degree programme of Geological Engineering	ASIIN, EUR-ACE® Label	Yes (by ANECA and AQU Catalunya)	TC 03, TC 11
University Master's degree programme in Civil Engineering	ASIIN, EUR-ACE® Label	Yes (by ANECA and AQU Catalunya)	TC 03
Master's degree programme in Numerical Methods for Engineering	ASIIN, EUR-ACE® Label	Yes (by ANECA and AQU Catalunya)	TC 03
Date of the contract: 12.11.2014 **Submission of the final version of the self-assessment report:** 12.11.2014 **Date of the onsite visit:** 03. – 05.12.2014 **at:** UPC Campus North			
Peer panel: Prof. Dr. Joaquín Diaz, Technische Hochschule Mittelhessen			

[1] ASIIN Seal for degree programmes; EUR-ACE® Label: European Label for Engineering Programmes;
[2] TC 03 – Civil Engineering, Surveying and Architecture; TC 11 – Geosciences;

Prof. Dr. rer. nat. Hans-Jürgen Gursky, TU Clausthal Dipl.-Ing. Alfredo Barillas Nova, TSB Ing – Managing director (Industry representative) **The panel of AQU Catalunya:** Prof. Dr. Manuel Casteleiro, Universidad de A Coruña, Academic Representative, Team President Prof. Dr. Josep Poblet, Universidad de Oviedo, Academic Representative Albert Corominas, Infraestructures, Industry Representative José María Ramos, Ciments Molins, Industry Representative Carlos Romero, Universidad Complutense, Student Representative Dídac Navarro, Universitat Autònoma de Barcelona, Student Representative Josep Grifoll, AQU Catalunya, Technical Director for Quality Assurance at AQU Catalunya
Representative of the ASIIN headquarter: Mila Zarkh, ASIIN Project Manager (International Office)
Responsible decision-making committee: Programme Accreditation Commission
Criteria used: European Standards and Guidelines as of as of 2009 (third edition) ASIIN General Criteria, as of 17.04.2013 Subject-Specific Criteria of Technical Committee 03 – Civil Engineering, Surveying and Architecture as of 29.09.2012 Subject-Specific Criteria of Technical Committee 11 – Geosciences as of 09.12.2011

In order to facilitate the legibility of this document, only masculine noun forms will be used hereinafter. Any gender-specific terms used in this document apply to both women and men.

B Characteristics of the Degree Programmes

a) Name & Final Degree	b) Areas of Specialization	c) Mode of Study	d) Duration & Credit Points	e) First time of offer & Intake rhythm	f) Number of students per intake	g) Fees
Bachelor's degree programme of Civil Engineering	No specialization	Full time	8 Semesters 240 CP	2010, annually in fall semester	120 annually	According to the ECTS chosen by students, 35,77 € / ECTS
Bachelor's degree programme of Construction Engineering	Minor Civil Construction, Minor Hydrology, Minor Transportation & Urban Planning	Full time	8 Semesters 240 CP	2010, annually in fall semester	80 annually	According to the ECTS chosen by students, 35,77 €/ ECTS
Bachelor's degree programme of Geological Engineering	No specialization	Full time	8 Semesters 240 CP	2010, annually in fall semester	40 annually	According to the ECTS chosen by students, 35,77 € / ECTS
University Master's degree programme in Civil Engineering	- Speciality in structural and construction engineering - Speciality in geotechnical engineering - Speciality in water engineering - Speciality in computational engineering - Speciality in transportation engineering and urban planning - Speciality in environmental engineering and sustainability	Full time	4 Semesters 120 CP	2007, every semester	120 annually	According to the ECTS chosen by students, 51,46 € / ECTS

a) Name & Final Degree	b) Areas of Specialization	c) Mode of Study	d) Duration & Credit Points	e) First time of offer & Intake rhythm	f) Number of students per intake	g) Fees
Master's degree programme in Numerical Methods of Engineering		Full time	4 Semesters 120 CP	2006, annually in the fall semester	35 annually	According to the ECTS chosen by students, 51,46 €[3] / ECTS

For the degree programme Civil Engineering, the self-assessment report states the following **intended learning outcomes**:

Basic Competencies	
1ForBa1.1	Ability to solve the types of mathematical problems that may arise in engineering. Ability to apply knowledge of: linear algebra; geometry; differential geometry; differential and integral calculus; differential equations and partial derivatives; numerical methods; numerical algorithms; statistics and optimisation.
1ForBa1.2	Ability to select resources from knowledge of: linear algebra; geometry; differential geometry; differential and integral calculus; differential equations and partial derivatives; numerical methods; numerical algorithms; statistics and optimisation. All with a view to solving the types of mathematical problems that may arise in engineering
1ForBa1.3	Ability to provide analytical descriptions of curves and surfaces, calculate their properties and perform differential calculus operations on them; find analytical solutions to complex contour and initial value problems in various dimensions and with simple geometrical conditions enabling an analysis, including a parametric study, to be made of these solutions
1ForBa1.4	Ability to deal with and solve advanced mathematical engineering problems, from the posing of the problem to its formulation and implementation in a computer program.
1ForBa2.1	Students will acquire spatial vision and graphic presentation skills using both traditional metric and descriptive geometry methods and CAD applications.
1ForBa2.2	Students will acquire the ability to select and use graphic presentation techniques and CAD programs to solve civil engineering problems.
1ForBa3.1	Students will acquire basic knowledge of the use and programming of computers, operating systems, databases and applications for engineering.
1ForBa3.2	Ability to formulate, programme and apply analytical and numerical calculation models to design, planning and management. Ability to interpret the results provided by the models in the civil engineering context.

[3] For non-EU residents, the study fees are 1,5 times of one credit: http://www.upc.edu/learning/courses/masters-degrees/civil-engineering (15.12.2014)

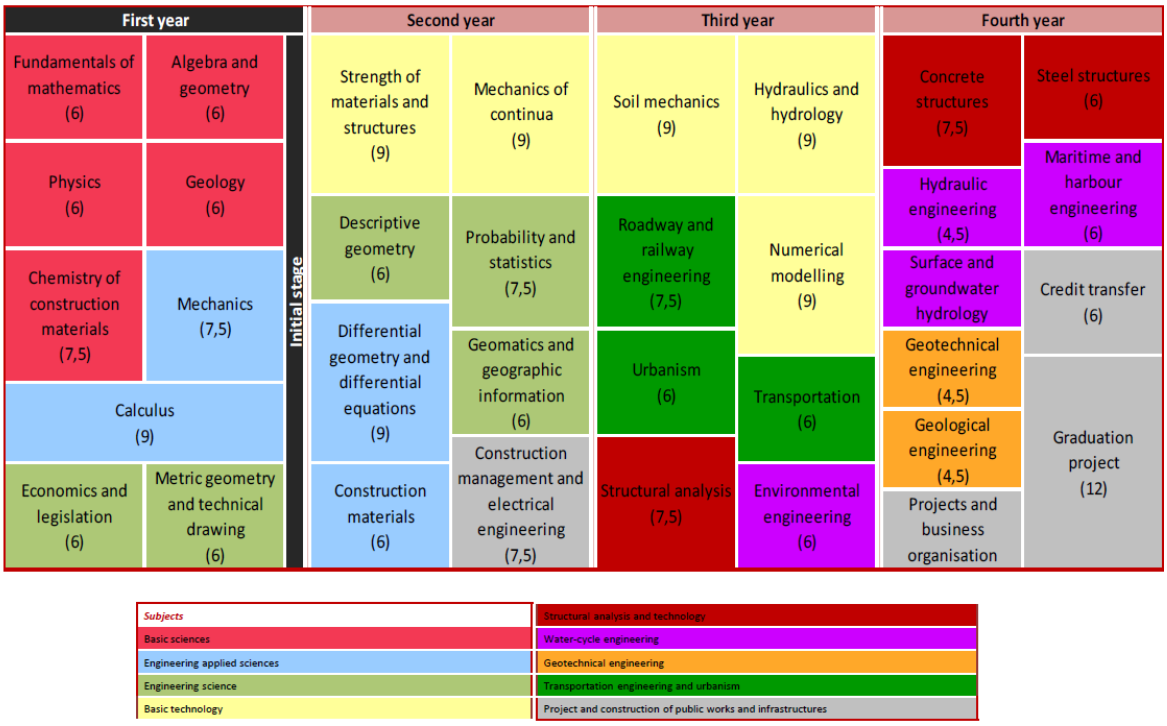
1ForBa4.1	Understanding and mastery of the basic concepts of the general laws of mechanics, thermodynamics and electromagnetic fields and waves, and their application in solving engineering problems.
1ForBa4.2	Predictive capacity in civil engineering problems of the concepts of the general laws of mechanics and thermodynamics, fields and waves and electromagnetism .
1ForBa4.3	Capacity for modelling and analytical and computational prediction of the mechanical behaviour of systems.
1ForBa5	Basic knowledge of geology and terrain morphology and the ability to apply it to engineering problems.Climatology.
1ForBa6	Students will acquire relevant knowledge of businesses and the institutional and legal framework in which they function. They will also study business organisation and management.
1ComCiv1.1	Knowledge of and ability to apply the concepts and techniques of topography and cartography necessary for obtaining measurements, drawing up plans, determining layouts, taking defined geometries onto the terrain and controlling the movements of structures and earthworks.
1ComCiv1.2	Knowledge of and ability to apply the concepts and techniques of astronomy, geodetics, digital models of the terrain and geographical information systems that underlie, complement and strengthen topographical and cartographic techniques.
1ComCiv2	Theoretical and practical knowledge of the chemical, physical, mechanical and technological properties of the materials most commonly used in construction.
1ComCiv3.1	Ability to apply knowledge of construction materials to structural systems. Knowledge of the relation between the structure of materials and the mechanical properties resulting from them.
1ComCiv3.2	Understanding of the physico-chemical mechanisms that determine the stages in the lifecycle of construction materials (manufacture, use, elimination and recycling), their durability and their impact on the environment.
1ComCiv4.1	Ability to analyse and understand how the characteristics of structures influence their behaviour. Ability to apply knowledge of the resistance dynamics of structures in order to dimension them in accordance with existing regulations using analytical and numerical calculation methods.
1ComCiv4.2	Ability to calculate structures with interactive resistant mechanisms based on analytical and computational models approved by European Union regulations.
1ComCiv4.3	Understanding and mastery of the laws of thermodynamics of continuous media and the ability to apply them in the fields of engineering such as fluid mechanics, material mechanics, structures theory, etc.
1ComCiv5.1	Knowledge of soil and rock geotechnics and mechanics and the ability to apply this knowledge in carrying out studies, projects, constructions and exploitations in which earthmoving, foundations and retention structures are necessary.
1ComCiv5.2	Understanding of, and the ability to apply, predictive models of water filtration in soils and the mechanical behaviour of, and structural faults in, soils and rocks.
1ComCiv6.1	Students will acquire a basic awareness of the behaviour of reinforced concrete and metal structures and the capacity to conceive, design, build and maintain these types of structures.
1ComCiv6.2	Students will acquire the ability to select the most appropriate methods for calculating and dimensioning structural (reinforced and prestressed) concrete structures and metal structures to which European regulations apply.

1ComCiv7.1	Knowledge of hydrostatics and fluid mechanics and dynamics, and their application to hydraulics and hydrology. Knowledge of the concepts and technical aspects of both pressure and free surface conduction systems.
1ComCiv7.2	Students will acquire knowledge of hydrostatics and fluid mechanics and dynamics and the ability to design and dimension hydraulic works and plan and manage hydraulic resources.
1ComCiv8	Knowledge of the basic concepts of surface and underground hydrology.
1ComCiv9	Ability to analyse health and safety issues in construction works.
1ComCiv10	Fundamental knowledge of the electrical power system: energy generation and the transport and distribution network, and the types of lines and conductors. Knowledge of the low and high voltage regulations.
1ComCiv11	Ability to apply environmental impact study and assessment methodologies.
1ComCiv12	Knowledge of construction procedures, construction machinery and the techniques for organising, measuring and valuing works.
1EsCons1	Knowledge of the different types and basis for calculating prefabricated items and its application to the manufacturing processes.
1EsCons2	Knowledge of the design, calculation, construction and maintenance of building works in regard to their structure, finishes, installations and equipment.
1EsCons3.1	Ability to construct and conserve maritime works.
1EsCons3.2	Understanding of the climate-wind-waves-coast inter-relation and how this conditions maritime works.
1EsCons4.1	Ability to construct, conserve, dimension and design roads and the items comprising basic road provision.
1EsCons4.2	Understanding of and ability to quantify the road and traffic variables determining the safety, quality and sustainability of road transport infrastructures.
1EsCons5.1	Ability to construct and conserve railway lines with knowledge of the application of the specific technical regulations, differentiating the characteristics of the rolling stock.
1EsCons5.2	Understanding of the theoretical models explaining the mechanical behaviour of the tracks, the interaction between track and train, and their influence on design specifications.
1EsCons6	Ability to use the appropriate construction procedures, construction machinery and planning techniques in carrying out works.
1EsCons7	Students will acquire the skills needed to build geotechnical works.
1EsCons8	Knowledge and understanding of supply and treatment systems, and how to dimension, construct and conserve them.
1TecAd1	Knowledge of and ability to design and dimension hydraulic works and facilities, energy systems and the harnessing of hydroelectric energy, and plan and manage surface and underground hydraulic resources.
1TecAd2	Knowledge and understanding of the functioning of ecosystems and environmental factors.
1TecAd3	Knowledge of the urban management regulatory framework. Understanding of the urban phenomenon and the factors determining it (history, economy, human activity, mobility). Understanding of and ability to draw up urbanisation projects.

1TecAd4	Knowledge of the influence of infrastructures on town and country planning enabling participation in the urbanisation of urban public space, and on plans for urban services and utilities such as water distribution, sewage disposal, waste management, transport systems, traffic, lighting, etc.
1TecAd5	Knowledge of the design and functioning of intermodal exchange infrastructures such as ports, airports, railway stations and transport logistics centres.
1TFG	An original exercise to be done individually and presented and defended in front of a university panel consisting in a project in the sphere of the specific civil engineering technologies synthesising and integrating the competences acquired on the program.
Transversal competencies	
G1	ENTREPRENEURSHIP AND INNOVATION: Knowing about and understanding how businesses are run and the sciences that govern their activity. Having the ability to understand labor laws and how planning, industrial and marketing strategies, quality and profits relate to each other.
G2	SUSTAINABILITY AND SOCIAL COMMITMENT. Being aware of and understanding the complexity of social and economic phenomena that characterize the welfare society. Having the ability to relate welfare to globalization and sustainability. Being able to make a balanced use of techniques, technology, the economy and sustainability.
G3	THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
G4	EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
G5	TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
G6	EFFECTIVE USE OF INFORMATI0N RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.
G7	SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.
G8	Students will learn to identify, formulate and solve a range of engineering problems. They will be expected to show initiative in interpreting and solving specific civil engineering problems and to demonstrate creativity and decision-making skills. Finally, students will develop creative and systematic strategies for analysing and solving problems.

G9	Students will learn to plan, design, manage and maintain systems suitable for use in civil engineering. They will develop a systematic approach to the complete life-cycle of a civil engineering infrastructure, system or service, which includes drafting and finalising project plans, identifying the basic materials and technologies required, making decisions, managing the different project activities, performing measurements, calculations and assessments, ensuring compliance with specifications, regulations and compulsory standards, evaluating the social and environmental impact of the processes and techniques used, and conducting economic analyses of human and material resources.

The following **curriculum** is presented:



For the degree programme Construction Engineering, the self-assessment report states the following **intended learning outcomes**:

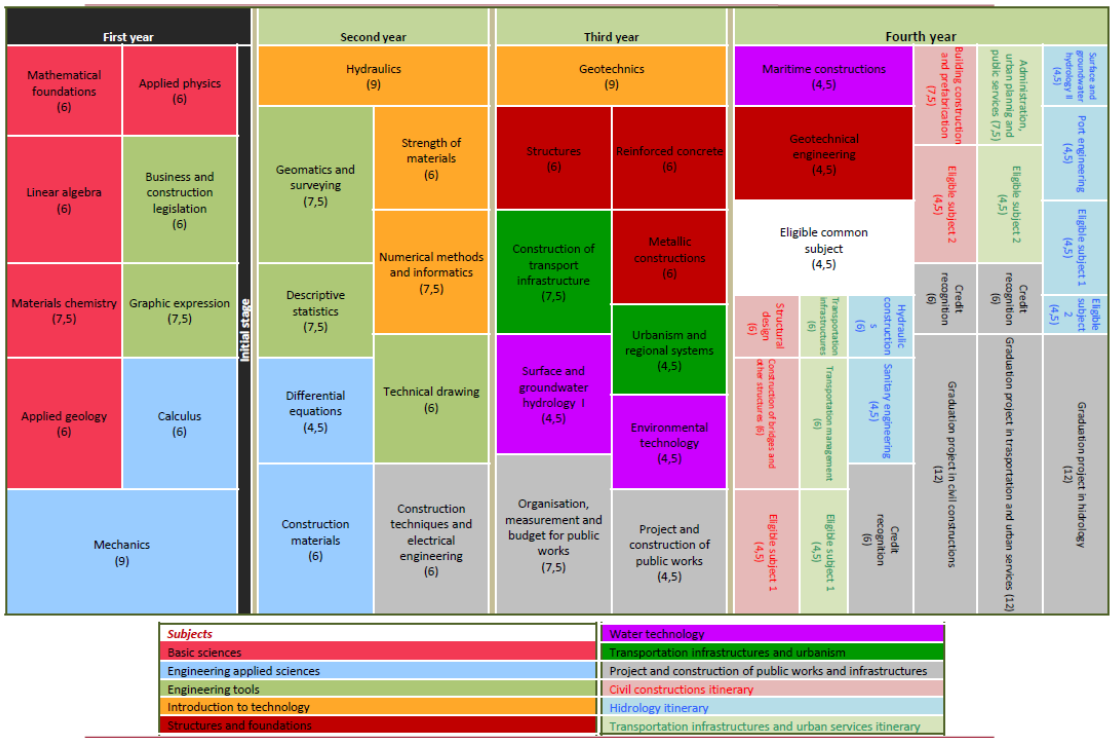
Basic Competencies	
2ForBa1	Ability to solve the types of mathematical problems that may arise in engineering. Ability to apply knowledge of: linear algebra; geometry; differential geometry; differential and integral calculus; differential equations and partial derivatives; numerical methods; numerical algorithms; statistics and optimisation.
2ForBa2	Capacity for spatial vision and knowledge of graphic representation techniques based on both traditional metric geometry and descriptive geometry methods, and computer-assisted design applications
2ForBa3	Basic knowledge of computer use and programming, operating systems, databases and software as applied to engineering

2ForBa4	Understanding and mastery of the basic concepts of the general laws of mechanics, thermodynamics and electromagnetic fields and waves, and their application in solving engineering problems
2ForBa5	Basic knowledge of geology and terrain morphology and their application to engineering problems. Climatology
2ForBa6	Adequate knowledge of the concept of companies and their institutional and legal framework. Company organisation and management
2ComCiv1	Knowledge of the essential topography techniques for obtaining measurements, drawing up plans, determining layouts, taking defined geometries onto the terrain and controlling the movements of structures and earthworks.
2ComCiv2	Theoretical and practical knowledge of the chemical, physical, mechanical and technological properties of the materials most commonly used in construction.
2ComCiv3	Ability to apply knowledge of construction materials to structural systems. Knowledge of the relation between the structure of materials and the mechanical properties resulting from them
2ComCiv4	Ability to analyse and understand how the characteristics of structures influence their behaviour. Ability to apply knowledge of the resistance dynamics of structures in order to dimension them in accordance with existing regulations using analytical and numerical calculation methods
2ComCiv5	Knowledge of soil and rock geotechnics and mechanics and the ability to apply it in carrying out studies, projects, constructions and exploitations in which earthmoving, foundations and retention structures are necessary.
2ComCiv6	Knowledge of the bases and application of the behaviour of reinforced concrete and metal structures and the ability to conceive, design, construct and maintain this type of structures.
2ComCiv7	Knowledge of the concepts and technical aspects of both pressure and free surface conduction systems
2ComCiv8	Knowledge of the basic concepts of surface and underground hydrology.
2ComCiv9	Ability to analyse health and safety issues in construction works
2ComCiv10	Fundamental knowledge of the electrical power system: energy generation and the transport and distribution network, and the types of lines and conductors. Knowledge of the low and high voltage regulations
2ComCiv11	Ability to apply environmental impact study and assessment methodologies.
2ComCiv12	Knowledge of construction procedures, construction machinery and the techniques for organising, measuring and valuing works.
2EsCons1	Knowledge of the different types and basis for calculating prefabricated items and its application to the manufacturing processes
2EsCons2	Knowledge of the design, calculation, construction and maintenance of building works in regard to their structure, finishes, installations and equipment.
2EsCons3	Ability to construct and conserve maritime works
2EsCons4	Ability to construct, conserve, dimension and design roads and the items comprising basic road provision
2EsCons5	Ability to construct and conserve railway lines with knowledge of the application of the specific technical regulations, differentiating the characteristics of the rolling stock

2EsCons6	Ability to use the appropriate construction procedures, construction machinery and planning techniques in carrying out works
2EsCons7	Ability to construct geotechnical works
2EsCons8	Knowledge and understanding of supply and treatment systems, and how to dimension, construct and conserve them
2EsHid1	Knowledge of and ability to design and dimension hydraulic works and facilities, energy systems and the harnessing of hydroelectric energy, and plan and manage surface and underground hydraulic resources
2EsHid2	Knowledge and understanding of the functioning of ecosystems and environmental factors
2EsHid3	Knowledge of the design of urban services and utilities to do with water distribution and sewage treatment
2EsHid4	Knowledge and understanding of supply and treatment systems, and of how to dimension, construct and conserve them
2EsTSU1	Ability to construct, conserve, dimension and design roads and the items comprising basic road provision
2EsTSU2	Ability to construct and conserve railway lines with knowledge of the application of the specific technical regulations, differentiating the characteristics of the rolling stock
2EsTSU3	Knowledge of the regulatory framework of urban management
2EsTSU4	Knowledge of the influence of infrastructures on town and country planning enabling participation in the urbanisation of urban public space, and on plans for urban services and utilities such as water distribution, sewage disposal, waste management, transport systems, traffic, lighting, etc
2EsTSU5	Knowledge of the design and functioning of intermodal exchange infrastructures such as ports, airports, railway stations and transport logistics centres
2TFG	An original exercise to be done individually and presented and defended in front of a university panel consisting in a project in the sphere of the specific civil engineering technologies synthesising and integrating the competences acquired on the program.
Transversal competencies	
G1	ENTREPRENEURSHIP AND INNOVATION: Knowing about and understanding how businesses are run and the sciences that govern their activity. Having the ability to understand labor laws and how planning, industrial and marketing strategies, quality and profits relate to each other.
G2	SUSTAINABILITY AND SOCIAL COMMITMENT. Being aware of and understanding the complexity of social and economic phenomena that characterize the welfare society. Having the ability to relate welfare to globalization and sustainability. Being able to make a balanced use of techniques, technology, the economy and sustainability.
G3	THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
G4	EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.

G5	TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
G6	EFFECTIVE USE OF INFORMATI0N RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.
G7	SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.
G8	Students will learn to identify, formulate and solve a range of engineering problems. They will be expected to show initiative in interpreting and solving specific civil engineering problems and to demonstrate creativity and decision-making skills. Finally, students will develop creative and systematic strategies for analysing and solving problems.
G9	Students will learn to plan, design, manage and maintain systems suitable for use in civil engineering. They will develop a systematic approach to the complete life-cycle of a civil engineering infrastructure, system or service, which includes drafting and finalising project plans, identifying the basic materials and technologies required, making decisions, managing the different project activities, performing measurements, calculations and assessments, ensuring compliance with specifications, regulations and compulsory standards, evaluating the social and environmental impact of the processes and techniques used, and conducting economic analyses of human and material resources.

The following **curriculum** is presented:



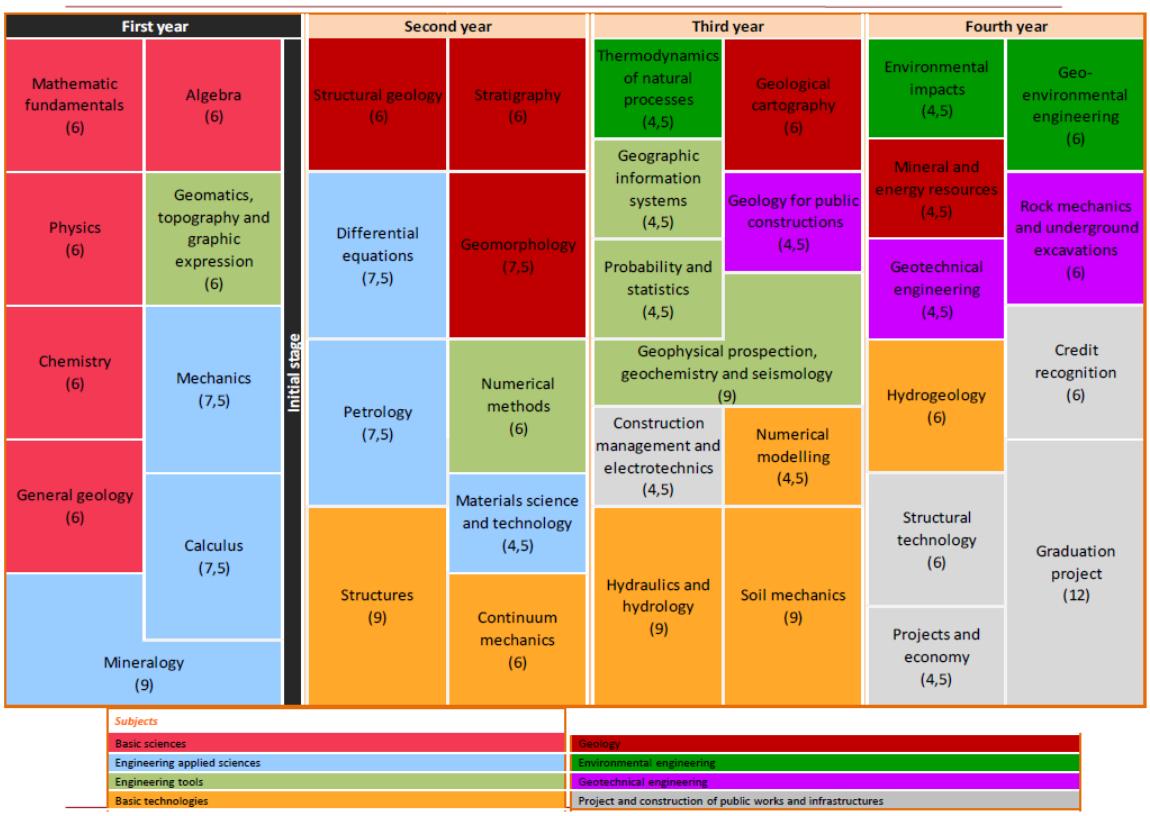
For the degree programme Geological Engineering, the self-assessment report states the following **intended learning outcomes**:

Basic Competencies	
3ForBa1	Ability to solve the types of mathematical problems that may arise in engineering. Ability to apply knowledge of: linear algebra; geometry; differential geometry; differential and integral calculus; differential equations and partial derivatives; numerical methods; numerical algorithms; statistics and optimization
3ForBa2	Capacity for spatial vision and knowledge of graphic representation techniques based on both traditional metric geometry and descriptive geometry methods, and computer-assisted design applications
3ForBa3	Basic knowledge of computer use and programming, operating systems, databases and software as applied to engineering
3ForBa4	Understanding and mastery of the basic concepts of the general laws of mechanics, thermodynamics and electromagnetic fields and waves, and their application in solving engineering problems
3ForBa5	Basic knowledge of geology and terrain morphology and their application to engineering problems. Climatology
3ForBa6	Adequate knowledge of the concept of companies and their institutional and legal framework. Company organisation and management
3Comun1	Ability to solve ordinary differential equations for application to engineering problems
3Comun2	Understanding of the concepts of randomness of physical, social and economic phenomena, and uncertainty
3Comun3	Knowledge of basic numerical calculus as applied to engineering
3Comun4	Understanding and mastery of the basic concepts of the general laws of mechanics and thermodynamics, and their application in solving engineering problems. Heat transfer and thermal matter and machines
3Comun5	Ability to become familiar with, understand and use the principles and technologies of materials
3Comun6	Knowledge of soil and rock geotechnics
3Comun7	Knowledge of the strength of materials and structures theory
3Comun8	Knowledge of topography, photogrammetry and cartography
3Comun9	Knowledge of the principles of fluid mechanics and hydraulics
3Comun10	Ability to analyse health and safety issues in designs, plants and installations
3Comun11	Fundamental knowledge of the electrical power system: energy generation and the transport and distribution network, and the types of lines and conductors. Knowledge of the low and high voltage regulations. Knowledge of basic electronics and control systems
3Comun12	Ability to apply methodologies for studying and assessing environmental impact, and, in general, environmental technologies, sustainability and waste disposal
3Comun13	Capacity for integral planning and management of works, measurements, setting out, control and monitoring
3Comun14	Knowledge of construction procedures
3Comun15	Knowledge of project methodology, management and organization

3TecEs1.1	Geophysical and geochemical prospecting
3TecEs1.2	Students will acquire knowledge of seismology and earthquake engineering.
3TecEs10	Deposit modelling
3TecEs11.1	Geotechnical studies applied to mining, construction and civil engineering work
3TecEs11.2	Students will acquire knowledge of geotechnical engineering, including modelling of public infrastructures, underground structures and geotechnical structures.
3TecEs11.3	Students will learn to apply their knowledge of geotechnical engineering to linear constructions and other geotechnical structures.
3TecEs12	Design and execution of surface and underground works
3TecEs13	Ecology and regional development. Town and country planning and management
3TecEs2.1	Design, planning and execution of projects for prospecting for and extracting minerals, rocks, fossil and nuclear fuels, and groundwater, and geotechnical projects. Students will learn to design, plan and carry out fluid injections into underground structures.
3TecEs2.2	Capacity to develop and select tools for prospection and extraction of natural resources as well injection of fluids in the underground.
3TecEs3	Drilling and support techniques for underground and surface works
3TecEs4.1	Mineralogical, petrographic and geotechnical tests. Sample techniques.
3TecEs4.2	Students will learn to select the most appropriate sampling and implementation techniques for mineralogical, petrographic and geotechnical surveys.
3TecEs5.1	Quality control of the materials used
3TecEs5.2	Students will develop an understanding of materials science, including chemical and physical properties and the mechanical characteristics that derive from them.
3TecEs6	General and detailed geology
3TecEs7.1	Hydrological, hydrogeological, stratigraphic and palaeontological studies.
3TecEs7.2	Ability for the development and selection of tools for the analysis of hydrogeological and estratigraphic problems.
3TecEs8	General and detailed topography
3TecEs9.1	Production of detailed cartography
3TecEs9.2	Students will learn to apply geographic information techniques to the design and production of thematic maps.
3TFG	An original exercise to be done individually and presented and defended in front of a university panel consisting in a project in the sphere of the specific civil engineering technologies synthesising and integrating the competences acquired on the program.
Transversal Competencies	
G1	ENTREPRENEURSHIP AND INNOVATION: Knowing about and understanding how businesses are run and the sciences that govern their activity. Having the ability to understand labor laws and how planning, industrial and marketing strategies, quality and profits relate to each other.
G2	SUSTAINABILITY AND SOCIAL COMMITMENT. Being aware of and understanding the complexity of social and economic phenomena that characterize the welfare society. Having the ability to relate welfare to globalization and sustainability. Being able to make a balanced use of techniques, technology, the economy and sustainability.

G3	THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.
G4	EFFICIENT ORAL AND WRITTEN COMMUNICATION. Communicating verbally and in writing about learning outcomes, thought-building and decision-making. Taking part in debates about issues related to the own field of specialization.
G5	TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
G6	EFFECTIVE USE OF INFORMATI0N RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.
G7	SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.
G8	Students will learn to identify, formulate and solve a range of engineering problems. They will be expected to show initiative in interpreting and solving specific civil engineering problems and to demonstrate creativity and decision-making skills. Finally, students will develop creative and systematic strategies for analysing and solving problems.
G9	Students will learn to plan, design, manage and maintain systems suitable for use in civil engineering. They will develop a systematic approach to the complete life-cycle of a civil engineering infrastructure, system or service, which includes drafting and finalising project plans, identifying the basic materials and technologies required, making decisions, managing the different project activities, performing measurements, calculations and assessments, ensuring compliance with specifications, regulations and compulsory standards, evaluating the social and environmental impact of the processes and techniques used, and conducting economic analyses of human and material resources.

The following **curriculum** is presented:



For the Master's degree programme Civil Engineering, the self-assessment report states the following **intended learning outcomes**:

Basic Competencies	
CB6	Knowledge that enables them to be original in the development and/or application of ideas, often in a research context.
CB7	The ability to apply their knowledge and problem-solving skills in new or unfamiliar environments within wider (or multidisciplinary) contexts related to their area of study.
CB8	The ability to integrate knowledge and deal with the complexity of making judge-ments on the basis of information that, albeit incomplete or limited, includes thoughts on the role played by social and ethical responsibility in the application of their knowledge and judgement.
CB9	The ability to communicate their conclusions and the knowledge and reasons that ultimately sustain them to specialised and lay audiences in a clear and unambiguous way.
CB10	The learning abilities that will enable them to keep studying in a largely self-directed or independent manner.

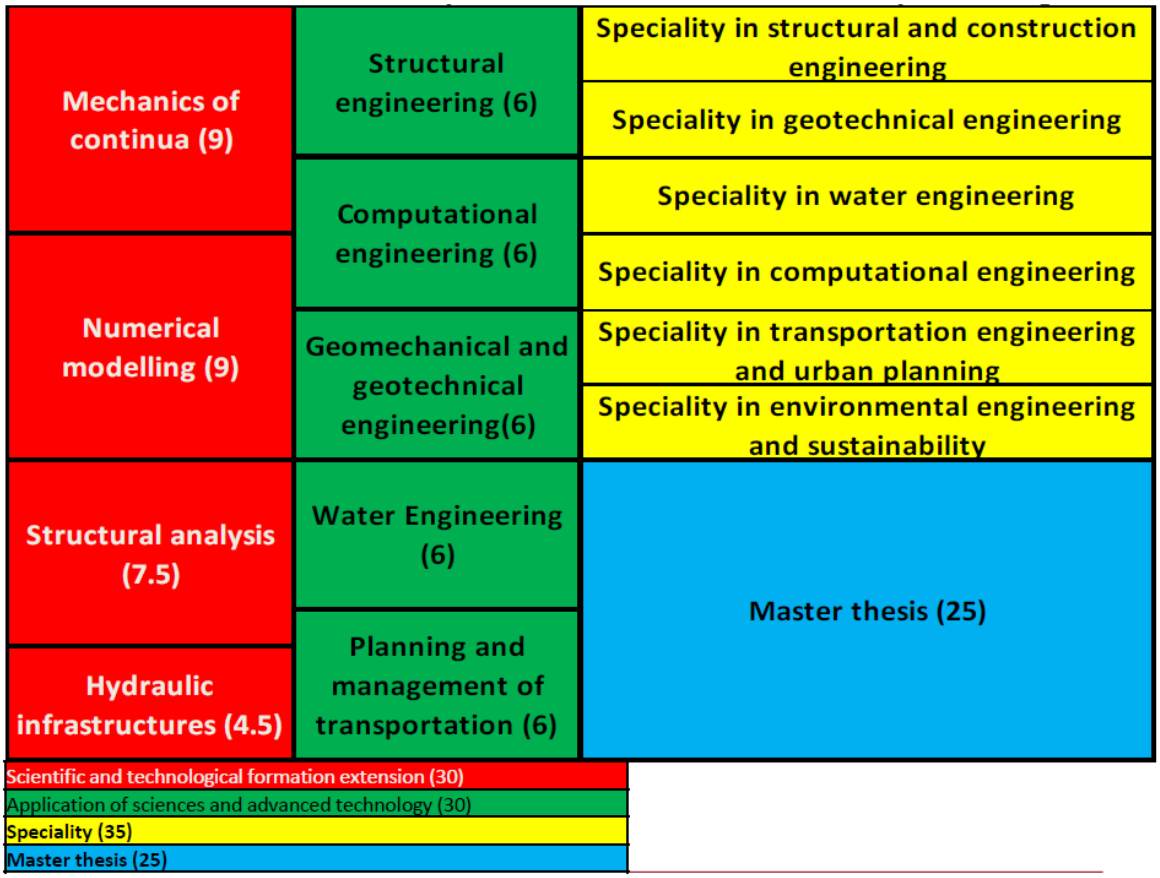
General Competencies	
CG1	The scientific, technical and methodological skills that enable them to continuously update their knowledge and carry out the professional functions of advice, analysis, design, calculation, drafting, planning, supervision, management, construction, maintenance, conservation and use in civil engineering fields.
CG2	An understanding of the multiple constraints, including those related to technique, the law and property, that arise in designing a public work and the capacity to establish valid alternatives, choose the best of these and develop it appropriately while foreseeing potential construction problems and using the most appropriate methods and technologies, both traditional and innovative, to achieve the greatest degree of efficacy and favour progress and the development of a sustainable society that respects the environment.
CG3	The skills, understanding and capacities needed to apply relevant legislation in the civil engineering profession.
CG4	Knowledge of the history of civil engineering and the skills needed to analyse and assess public works, in particular, and construction, in a more general sense.
CG5	Knowledge of the civil engineering profession and the activities of which it is composed.
CG6	Knowledge that enables them to apply technical and managerial skills in civil engineering R&D.
CG7	The ability to plan, design, inspect and supervise infrastructure works for land transport (roads, railways, bridges, tunnels and urban thoroughfares) and maritime transport (port works and facilities).
CG8	Knowledge of the problems of designing and building the various elements that make up an airport and methods for conservation and use.
CG9	The ability to plan and manage water and energy resources, including integrated water cycle management.
CG10	The ability to carry out studies related to spatial planning, coastal environments, coastal planning and defence, and environmental aspects of infrastructure.
CG11	The ability to design, implement and inspect infrastructure (bridges, buildings, etc.), foundations and underground civil works (tunnels, car parks, etc.) and diagnose their structural integrity.
CG12	The ability to plan, design and manage infrastructure and its maintenance, conservation and use.
CG13	The ability to plan, carry out studies on and design the catchment of surface and ground water (dams, pipelines and pumps).
CG14	The ability to carry out studies, spatial and urban design plans and urban development projects.
CG15	The ability to environmentally evaluate and condition infrastructure works for design, construction, rehabilitation and conservation.

CG16	The ability to design and implement systems for drinking water treatment, including desalination; water purification treatment; and waste collection and treatment, including the collection and treatment of urban, industrial and even dangerous waste.
CG17	The ability to apply business management techniques and labour law.
CG18	Sufficient knowledge of scientific and technological aspects of mathematical, analytical and numerical methods in engineering, fluid mechanics, continuum mechanics, structural design, geotechnical engineering, maritime engineering, hydraulic works and facilities and linear works.
Specific competencies (legal requirements by the Ministry)	
AFC1	The ability to address and solve advanced mathematical problems in engineering, from the scope and context of the problem to its statement and implementation in a computer program. In particular, the ability to formulate, program and apply advanced analytical and numerical calculation models to the design, planning and management of a project, as well as the ability to interpret the results obtained in the of civil engineering.
AFC2	Comprehension and mastery of the laws governing the thermomechanics of continuous media for their application in fields of engineering such as fluid mechanics, the mechanics of materials, structural theory, etc.
CienTec1	The ability to apply knowledge of soil and rock mechanics to the study, design, construction and operation of foundations, cuts, fills, tunnels and other constructions over or through land, whatever its nature and state, and whatever the purpose of the work.
CienTec2	Knowledge of and competence in the application of advanced structural design and calculations for structural analysis, based on knowledge and understanding of forces and their application to civil engineering structures. The ability to assess structural integrity.
CienTec3	Knowledge of all kinds of structures and materials and the ability to design, execute and maintain structures and buildings for civil works.
CienTec4	The ability to plan, dimension, construct and maintain hydraulic works.
CienTec5	The ability to plan, evaluate and regulate the use of surface water and groundwater resources.
CienTec6	The ability to plan and dimension water and wastewater processing and treatment systems.

CienTec7	Knowledge of and the ability to understand dynamic phenomena of the coastal ocean and atmosphere and respond to problems encountered in port and coastal areas, including the environmental impact of coastal interventions. The ability to analyse and plan maritime works.
CienTec8	Knowledge of transport engineering and planning, transport types and functions, urban transport, management of public transport services, demand, costs, logistics, and financing of transport infrastructure and services.
CienTec9	The ability to analyse and interpret the regulation and impact of infrastructure and their repercussions for sustainable development, taking into account economic, environmental, social and cultural factors.
CienTec10	The ability to plan, manage and operate civil engineering infrastructure.
TFM	Once they have obtained all the credits required by the curriculum, students will have to write, present and defend an original piece of individual work to a panel of examiners. This piece of work must be a comprehensive civil engineering project of a professional standard that synthesises the skills acquired in the master's degree course.
Transversal competencies	
G1	INNOVATION, EMPLOYABILITY, DEVELOPMENT AND RESEARCH: The ability to develop one's creative and innovative tendencies with the ultimate aim of serving the development and progress of society. The ability to work on a research topic. Employability in managerial posts in all types of companies and public authorities, coupled with initiative and decision-making abilities.
G2	SUSTAINABILITY AND THE ENVIRONMENT: The capacity for engineering development in the framework of globalisation, sustainability and environmental protection. The ability to analyse the entire life cycle of an engineering project.
G3	FOREIGN LANGUAGE FOR SCIENCE AND TECHNOLOGY: Knowledge of English as a global language to a sufficient oral and written level, in keeping with what is required of master's degree students. The ability to prepare a technical or scientific paper in English for international publication. (Students must achieve Level C English by the time they graduate.)

G4	USE OF INTERNATIONAL INFORMATION RESOURCES: The ability to gather information from general and specialised international databases. The ability to find the most innovative and up-to-date information, compare it and identify its strengths and weaknesses.
G5	KNOWLEDGE DEVELOPMENT: The ability to develop new analytical methods and processes at all levels: conception, design and development. The ability to propose and develop specifications, regulations and rules in engineering following safety and efficiency criteria and using sustainable resources.
G6	PROMOTION AND MANAGEMENT OF ENGINEERING PROJECTS: The ability to identify and study society's needs and to transform these needs into infrastructure and services projects. The ability to write, develop and implement a project using knowledge of basic subjects and technologies; decision-making abilities; the ability to meet the needs for which it is designed; the ability to assess the social and environmental impact of the technical solutions adopted; and the ability to assess the funding and material and human resources needed to carry it out.

The following **curriculum** is presented:



For the Master's degree programme Numerical Methods of Engineering, the self-assessment report states the following **intended learning outcomes**:

Basic Competencies	
CB6	Knowledge that enables them to be original in the development and/or application of ideas, often in a research context.
CB7	The ability to apply their knowledge and problem-solving skills in new or unfamiliar environments within wider (or multidisciplinary) contexts related to their area of study.
CB8	The ability to integrate knowledge and deal with the complexity of making judgements on the basis of information that, albeit incomplete or limited, includes thoughts on the role played by social and ethical responsibility in the application of their knowledge and judgement.
CB9	The ability to communicate their conclusions and the knowledge and reasons that ultimately sustain them to specialised and lay audiences in a clear and unambiguous way.
CB10	The learning abilities that will enable them to keep studying in a largely self-directed or independent manner.
General Competencies	
CG1	Knowledge of numerical methods and problem-solving procedures. They will have completed and consolidated their basic training in solving problems using numerical and computational methods and reinforced their knowledge of the basics and of specific applications.
CG2	Knowledge of the theory and application of numerical methods. They will have acquired advanced knowledge and understanding of the theory and application of numerical methods to engineering problems.
CG3	Experience in solving problems using numerical methods. They will have gained experience and discernment in the application of numerical methods using calculation software, graphics pre- and post-processors, programming languages and scientific computation libraries.
CG4	A thorough understanding of criteria for applying numerical methods. They will have completed and consolidated knowledge, criteria and a critical approach to thinking about conventional solutions and analysing the results of typical numerical modelling problems.
CG5	Knowledge of social networks in the field of numerical methods. They will be familiar with the vanguard of the Spanish, European and international community surrounding numerical methods in engineering, and be able to evaluate it critically.

CG6	Knowledge of numerical modelling of real problems. They will have perfected their skills in solving real engineering problems using numerical modelling by identifying the underlying mathematical model and the most appropriate calculation method and critically interpreting the results.
CG7	Critical independence. They will be able to use their knowledge and understanding of computational engineering independently to design solutions to new or unfamiliar problems by incorporating, if necessary, theoretical and practical knowledge of other disciplines in engineering and the basic sciences and designing new solving methods that are original and appropriate to their purpose.
CG8	Knowledge of the scope of numerical methods. They will have understood the applicability and limitations of numerical modelling and existing computational technologies.
CG9	Research autonomy. They will have gained experience and autonomy in searching for, filtering, compiling and summarising cutting-edge scientific and technical information.
Specific Competencies	
CE1	Practical numerical modeling skills. Ability to acquire knowledge on advanced numerical modeling applied to different areas of engineering such as: civil or environmental engineering or mechanical and aerospace engineering or bioengineering or Nanoengineering and naval and marine engineering, etc..
CE2	Knowledge of the state of the art in numerical algorithms. Ability to catch up on the latest technologies for solving numerical problems in engineering and applied sciences.
CE3	Materials modeling skills. Ability to acquire knowledge on modern physical models of the science of materials (advanced constitutive models) in solid and fluid mechanics.
CE4	Knowledge of validation and verification criteria. Management capacity for quality control techniques of numerical simulation (Validation and Verification).
CE5	Experience in numerical simulations. Acquisition of fluency in modern numerical simulation tools and their application to multidisciplinary problems engineering and applied sciences.
CE6	Interpretation of numerical models. Understanding the applicability and limitations of the various computational techniques.
CE7	Experience in programming calculation methods. Ability to acquire training in the development and use of existing computational programs as well as pre and post-processors, knowledge of programming languages and of standard calculation libraries.
Transversal Competencies	
CT1	ENTREPRENEURSHIP AND INNOVATION: An awareness and understanding of the mechanisms on which scientific research is based, as well as the mechanisms and instruments for transferring results among socio-economic agents involved in research, development and innovation processes, and the capacity to lead teams that include members from a range of disciplines and with diverse professional backgrounds.
CT2	SUSTAINABILITY AND SOCIAL COMMITMENT: The ability to integrate knowledge and deal with the complexity of making judgements on the basis of information that, albeit incomplete or limited, includes thoughts on the role played by social and ethical responsibility in the application of one's knowledge and judgement.

CT3	FOREIGN LANGUAGE: A level of spoken and written English as a foreign language that enables one to work and communicate effectively in international and intercultural settings.
CT4	EFFECTIVE ORAL AND WRITTEN COMMUNICATION: The acquisition of the communication skills needed to make oral presentations and write professional and scientific reports in a clear and concise manner, as well as to communicate conclusions, and the knowledge and reasons that ultimately sustain them, to specialised and lay audiences in a clear and unambiguous way.
CT5	TEAMWORK: The ability to work in an interdisciplinary team, whether as a member or as a leader, with the aim of contributing to projects pragmatically and responsibly and making commitments in view of the resources that are available, and an awareness of the national and international community surrounding numerical methods in engineering.
CT6	EFFECTIVE USE OF INFORMATION RESOURCES: The ability to acquire, structure, analyse and present data and information in the chosen area of specialisation and critically assess the results obtained.
CT7	INDEPENDENT LEARNING: The ability to identify and overcome gaps in one's knowledge by thinking critically and choosing the best approach to extending one's knowledge, as well as the motivation for lifelong learning in one's career.

The following **curriculum** is presented:

	Subjects	ECTS credits	Type
FIRST SEMESTER	Advanced Fluid Mechanics	5	Compulsory
	Communication Skills 1	5	Compulsory
	Computational Mechanics Tools	5	Compulsory
	Continuum Mechanics	5	Compulsory
	Finite Element	5	Compulsory
	Numerical Methods for Pdes	5	Compulsory
SECOND SEMESTER	Computational Solid Mechanics	5	Compulsory
	Computational Structural Mechanics and Dynamics	5	Compulsory
	Coupled Problems	5	Optional
	Domain Descomposition and Large Scale Scientific Computing	5	Compulsory
	Finite Elements in Fluids	5	Compulsory
	Programming for Engineers and Scientists	5	Optional
THIRD SEMESTER	Advanced Discretization Methods	5	Optional
	Communication Skills 2	5	Compulsory
	Entrepreneurship	5	Compulsory
	Industrial Training	15	Compulsory
	Industrial Training	15	Compulsory
FOURTH SEMESTER	Master Thesis	30	Project

C Peer Report for the ASIIN Seal[4]

1. Formal Specifications

Criterion 1 Formal Specifications

Evidence:

- http://www.upc.edu/learning/courses/Bachelors-degrees/civil-engineering-barcelona-etseccpb (information in English)
- www.camins.upc.edu

Preliminary assessment and analysis of the peers:

The formal specifications contain all relevant details on duration, foreseen ECTS, the type of studies and allow for a good first information for all relevant stakeholders. The website of the School of Civil Engineering ("school" is equal to "department" or "faculty" in this context) is structured in a coherent and clear way. The students can either access the information on every single programme, or chose a thematic way of studies and compare different programmes among them, also in further detail (e.g. curricula) which is very useful. The only information which is missing is the linguistic focus of the programmes. During the audit, the panel learned that the programmes are taught in Spanish and English and it is not a prerequisite to be able to speak Catalonian in order to pursue studies (for further detail, cf. also 3.1). This was not visible from the School's website, therefore the panel recommends to include the information on the linguistic policy there also in order to be consistent with the policy of the university to be internationally visible and attractive for international students.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 1:

The university stated that the problem of the information on the linguistic focus is known and about to be changed. However, the analysis and the recommendation of the peers remain valid until a change is visible. The criterion is herewith fulfilled.

[4] This part of the report applies also for the assessment for the European subject-specific labels. After the conclusion of the procedure, the stated requirements and/or recommendations and the deadlines are equally valid for the ASIIN seal as well as for the sought subject-specific label.

2. Degree programme: Concept & Implementation

Criterion 2.1 Objectives of the degree programme

Evidence:

- Cf. homepages of the study programmes under review (available in English):
  - Bachelor's of Civil Engineering:

    http://ocw.camins.upc.edu/ocw/home.htm;jsessionid=82C03237613BF96FF0AAED699C6A8730?execution=e1s1
  - Bachelor's of Construction Engineering:

    http://ocw.camins.upc.edu/ocw/home.htm;jsessionid=82C03237613BF96FF0AAED699C6A8730?execution=e1s2
  - Bachelor's of Geological Engineering:

    http://ocw.camins.upc.edu/ocw/home.htm;jsessionid=82C03237613BF96FF0AAED699C6A8730?execution=e1s3
  - Master's in Civil Engineering:

    http://ocw.camins.upc.edu/ocw/home.htm;jsessionid=82C03237613BF96FF0AAED699C6A8730?execution=e1s4
  - Master's in Numerical Methods in Engineering:

    http://ocw.camins.upc.edu/ocw/home.htm;jsessionid=82C03237613BF96FF0AAED699C6A8730?execution=e1s5

Preliminary assessment and analysis of the peers:

The websites stated above contain a brief but explicit description of the programme objectives, clearly stating the professional fields and specializations of the offered degree programmes as well as programmes' peculiarities, such as in case of the chartered Master's in Civil Engineering which allows access to certain professional attributes in civil engineer in Spain (Ingeniero de Caminos, Canales y Puertos). From these descriptions, the level of the programmes can be clearly deduced, being in full compliance with the minimum standards of the EQF levels 6 for Bachelor's graduates and level 7 for Master's Graduates respectively.

Criterion 2.2 Learning Outcomes of the Programme

Evidence:

- Syllabi of the courses, cf. homepages of the degree programmes as indicated above

- State Standard for Civil Engineering, published in the Orden CIN/307/2009: http://www.boe.es/boe/dias/2009/02/18/pdfs/BOE-A-2009-2736.pdf, accessed on 29.12.2014
- State Standard for Mining Engineering, published in the Orden CIN/306/2009, http://www.boe.es/boe/dias/2009/02/18/pdfs/BOE-A-2009-2735.pdf, accessed on 29.12.2014
- State Standard for Ingeniero de Caminos, Canales y Puertos, published in the Orden CIN/309/2009:

  http://www.boe.es/boe/dias/2009/02/18/pdfs/BOE-A-2009-2738.pdf
- Discussions with representatives of the university (teachers and students)
- Lists of programme learning outcomes submitted by the university on December 28th, 2014

Preliminary assessment and analysis of the peers:

The university presented a list of programme learning outcomes for every programme specifying a generic or basic part of the education as well as a subject-specific part. The detailed analysis of the programme learning outcomes and an exemplary lineup with the ASIIN subject-specific criteria as defined by the Technical Committees 03 and 11 and, as a consequence, with the EUR-ACE framework criteria, will be presented individually for every programme below. The programme learning outcomes of all programmes were developed jointly with potential employers who are involved into the academic activities by different ways: either as representatives of the so called *catedra-empresa* (business-university collaboration entities focusing at joint research, development as well as teaching activities), or as members of the academic council of the university. Programme learning outcomes are accessible to all relevant stakeholders in the following manner: from the Spanish-language guides and the individual module descriptions the students can extract the information to what extent the programme learning outcomes are achieved by every single module; as for the English-language guides this is not the case which provokes a lack of transparency with regard to the foreign students.

Moreover, the panel learned that there is no overview of all relevant programme learning outcomes published on one website or one document easily accessible to all stakeholders. The programme learning outcomes are stated in the syllabi as “competencies at degree level which the module contributes to” but are nowhere published as a whole, neither in the national languages nor in English. The specializations offered by the degree programmes at the UPC are thus neither visible from the generic competence descriptions nor from the subject-specific state-prescribed part. The panel therefore considered

that the function of the programme learning outcomes as an important reference tool as part of the internal quality assurance is not very straightforward. For this reason, the panel recommended to publish the programme learning outcomes of every programme in a recapitulatory manner on the respective website.

Bachelor's degree programme Civil engineering and Bachelor's programme Construction Engineering (from p. 14):

The learning outcomes of the Bachelor's programme Civil Engineering, as they are available for students in the syllabi, are partly defined by the Polytechnic University of Catalonia and partly derived from the state standard for the chartered profession of the Technical Engineer of Civil Engineering ("la orden ministerial de grados que dan lugar a la profesión regulada de Ingeniero Técnico de Obras Públicas"). The part defined by the university encompasses the generic learning outcomes (G1-G7) as well as the subject-specific learning outcomes (G8-G9). The definitions of the learning outcomes presented here fully comply with the ASIIN subject-specific criteria as defined by the Technical Committee (TC) 03 – Civil Engineering, Surveying and Architecture and thus also with the EUR-ACE criteria which is clearly visible from the following exemplary analysis:

The university foresees that the graduates have acquired the capacity of solving engineering-related mathematical problems by applying deepened knowledge of algebra, geometry, differential and integral calculus (Basic Education, 1.1 – 1.3), as well as i.a. the basics of thermodynamics and magnetism (Basic Education 4.1 – 4.3) which fully reflects the ASIIN subject-specific requirement by the TC 03 that the graduates must "have acquired well-founded knowledge in the fields of mathematics and natural science, for example in the fields of mathematics, statistics, information processing, mechanics (fundamentals of statics and strength of materials), fluid mechanics".

The ASIIN subject-specific criterion foreseeing that the graduates "have deepened and expanded subject-specific skills, e.g. in the fields of structural analysis, structural engineering (steel, wood and solid construction), geotechnics/ foundation engineering, hydraulic engineering, water management, urban planning, transport, road system, railway system or water supply and management in settlements" is reflected in the general competence 9 (G9), stating the capacity for conceiving, drafting, managing and maintaining the systems in the field of the Civil Engineering, including the project management and the awareness of the life cycles as well as the environmental and social impact caused by the professional activity of a Civil Engineer. According to ASIIN criteria, the graduate must have applied these skills in "fields of construction economy/ construction business/ construction management, computer-aided building design, building restoration, building services engineering, finishing crafts, building permit procedure, construction contract

law, facility management, design practice" which is fully reflected by G1, indicating i.a. the innovation and entrepreneurial skills, the knowledge of the industrial law, the industrial and commercial strategies as well as of quality management.

The ASIIN criteria also foresee that graduates of a Bachelor's programme "can make use of classical and modern research methods to identify, interpret and integrate technical literature and data bases" which is fully reflected in G6, mentioning the acquisition, the structuring as well as the analysis and visualization of the data and information in the field of specialization and critical evaluation capacity the results of this processes.

As a further example of the conceptual compliance, the lifelong learning defined as one of key competencies in the ASIIN subject-specific criteria is reflected in G7, stating the capacity of independently identifying any lacks of own knowledge and finding an adequate way to overcome those thanks to the use of the critical reflection.

The competence statements G8 and G9 are labelled as "additional generic competencies in the field of Civil Engineering" in contrast to G1 to G7 being declared generic competencies defined by the UPC itself. However, the focus of those competencies on civil engineering becomes less obvious after the analysis of G1-G9 for the Bachelor of Construction Engineering which demonstrates exactly the same wording. The panel understood from the analysis of the programme objectives that the university stressed the differences between the competence profiles of the graduates in the state-standard based part of the document. By comparing the competence profiles of the Bachelor's degree programmes Civil Engineering and Construction Engineering, it became obvious that the university took the chance to specify in a very detailed way the expected learning outcomes in the first case but did not in the second (cf. ForBas1.1-1.4 instead of the more vast and copied from the law "Orden CIN/307/2009" ForBas 1, or ForBas 2.1-2.2 instead of copied ForBas 2; the competences of Basic Education from ForBas 5 and 6 are exactly the same for both programmes) which gives as a result a very standardized description of the latter programme, barely varying from the rest of comparable programmes in Spain. The panel also stated that the difference of the competence ForBas 1.1 and 1.2 is not clear, given that the wording is exactly the same besides the last sentence of 1.2. The same is true for ForBas 4.2 and 4.3.

The panel moreover found the individual profile of the Bachelor's in Construction Engineering as also rather weak given that it has not one individually defined learning outcome since all the described competencies are copied from the state standard. Thus, the prospective students or also potential employers of the graduates would not get a clear idea on what *specific* content-wise benefits the studies of Construction Engineering at the UPC would bring as opposed to the same programme at other institutions. The panel points out that the state standards used for developing/defining the competence profiles

of the Bachelor's programmes Civil Engineering and Construction Engineering are also rather input- than output-oriented and recommends revising the definitions of the UPC-formulated programme learning outcomes for all Bachelor's programmes with regard to outlining subject-specific skills and competencies in order to compensate the knowledge-oriented formulation of the state standards. Therefore the panel recommended making use of the university autonomy for defining the competence profiles by specifying the real professional and scientific outcomes of the programmes on the level of competencies, skills and knowledge individually for the Bachelor's programmes, and also by publishing these statements in the publicly accessible part of the website so that prospective as well as current students but also potential employers could easily find these documents.

Bachelor's programme Geological Engineering:

As for the content-wise compliance of the Bachelor's programme Geological Engineering with the international subject-specific standards of EUR-ACE and ASIIN, the panel stated both the programme concept as well as its implementation to be consistent with the international expectations. The compliance of the UPC-formulated generic competence statements with the ASIIN requirements of the TC 11, TC 03 and therefore also with the EUR-ACE framework is clearly visible from such statements as G2, stating the ability to understand the complexity of economic, social and sustainability-related phenomena connected to their professional activity, which complies with the requirement "in their actions are aware of the social and ethical responsibility and know about business ethical principles and standards"; or G3, foreseeing a sound use of the third language (preferably English) and G4, requiring the ability to communicate efficiently in written as well as oral form as well as the capacity of specialized discussions in the subject-related field show full compliance with ASIIN competence statements that graduates must be "able to communicate on content and problems of civil engineering with both professional colleagues and individuals of a wider public in foreign languages and in intercultural relations" as well as "to work both individually and as a part of international and mixed gender groups and to effectively organize and perform projects to grow into an appropriate and responsible leadership role".

As for the subject-specific part, mainly prescribed by the state standard (only the part labeled with "TecnEsp", i.g. of the technology-specific skills) it is specified in a more detailed way by stating the expected knowledge for a Bachelor's graduate of Geological Engineering. The programme learning outcome ForBas5, expecting the graduates to be familiar with the basic concepts of geology, terrain morphology as well as climatology and their application in the engineering-related fields corresponds to the ASIIN standard requiring the "knowledge and understanding of the essential features, processes, materials, history and the development of the Earth and life". Also the "basic knowledge and under-

standing of the natural sciences (Physics, Chemistry, Mathematics) underlying the study of Geology" is reflected for instance by Comun1, mentioning the mathematical and especially algebra proficiency, and not least Comun 4, referring to basics of Physics including Mechanics and thermodynamics, as well as Comun9, requiring the knowledge of the principles of fluids' mechanics and hydraulics.

The ability of "Appreciation of issues concerning sample selection, accuracy, precision and uncertainty during collection, recording and analysis of data in the field and laboratory" is reflected in the programme learning outcome TecnEsp4.1, mentioning the techniques of the mineralogical, petrographical as well as geotechnical sampling, as we as TecnEsp4.2, including the capacity of selection of the adequate technique for sampling and realization of mineralogical, petrographical and geotechnical experiments. Herewith, also the requirement of proving the "Basic ability in the formalisation and specification of problems whose solution involves the use of geo-methods" is reflected and the "basic ability to combine theory and practice to complete geology tasks" is trained.

The competences Comun6 to Comun8 reflect the vast base of the geological education provided at the UPC (geological engineering, soil and rock mechanics, topography, photogrammetry as well as cartography) by at the same time indicating the engineering-relevant aspects of the programme (e.g. material resistance, structure theory) which clearly shows that the programme can be awarded with the EUR-ACE label. The fulfilment of the framework criterion "basic knowledge of the application of information technology to geological science" by the programme learning outcome "ForBas3", indicating the basic knowledge about the use and programming of the geology-relevant IT facilities including operation systems and data bases, is another hint for the clear engineering application relevance of the programme.

Nevertheless, as for the Bachelor's progarmme Construction Engineering, the programme learning outcomes of the Bachelor Geological Engineering are rather too general as the generic part, formulated by UPC, is exactly the same as in case of the other two Bachelor's programmes and the subject-specific part is either copied from the state standard (cf. ForBas 1-6 and Comun 1-15) without any changes or individualization, or very input-oriented, such as the specific technology competencies, specified in a very detailed but very knowledge- (and not skill- or competence-oriented) way. Therefore, the above mentioned requirement also applies here.

Master's programme Civil Engineering:

The competence profile of the graduates of the Master's programme Civil engineering is split up into three parts: general and basic competences, transverse competences and subject-specific competencies, all defined by the university itself based on the legal

framework for the regulated profession. The panel confirmed a full conceptual compliance with the requirements for both the ASIIN and the EUR-ACE seal. The expected competences show a clear progress compared to the Bachelor's level. As an example for the conceptual compliance with the ASIIN requirements, the panel stated e.g. the ability "to face complex projects in an interdisciplinary and holistic way in light of sustainability, environmental, ecological and economic aspects, and to operate them responsibly by the help of contributions of other disciplines" to be reflected in the programme requirement CB8 (basic competence), defining the capacity to integrate knowledge and face complexity of making a judgement based on a incomplete or limited information and in the same time including reflections on the social and ethical responsibility of his professional activities. The ability to provide "novel and complex designs, constructions and developments (design), e.g. construction of buildings, development of new building products and components, development of new construction methods, design of wastewater systems, planning and development of transport facilities" is reflected in CienTec10 (subject-specific competence), defining the capacity of planification, administration and use of infrastructures connected to civil engineering, as well as CienTec3 (subject-specific competence), foreseeing the knowledge of every kind of infrastructure and materials, as well as the capacity for designing, drafting, implementing and maintaining the objects related to the field of civil engineering.

Master's programme Numerical Methods of Engineering:

The competence profile of the master's programme in Numerical Methods of Engineering is structured in the same way as the one of the MA Civil Engineering and also fully complies with the requirements of the ASIIN and EUR-ACE seals. In the following analysis, the panel concentrated on the subject-specific part given that some of general or transferable competences are similar or partly the same as in the case of the Master's Civil Engineering and were already dealt with above. Given that this programme is a priori conceived as an interdisciplinary one, the competences selected below are applicable to a vast range of tasks and duties in the engineering. For instance, the subject-specific ability "to develop new, challenging and innovative methods for documented evidence and forecasting, such as methods for verifying stability, energy efficiency, noise protection, flood protection, water supply" as defined by the Technical Committee 03 is integrated into the broader competence CE1 which refers to the knowledge of the advanced practical application of the numeric modeling in Civil, Environmental, Mechanical, Shipbuilding or Spatial engineering, as well as nano-, bio-engineering. Also the ability "to establish quality management systems based on scientific methods, to support and develop them further and by this to evaluate their own activities and the activities of others" is reflected in the programme learning outcome CE4, stating the knowledge of the criteria of validation and

verification and the ability to apply them in the quality management of the numerical simulation. Furthermore, the competence "to integrate interdisciplinary research and development processes in planning and concepts", which can be placed among the crucial ones, is represented by the competence CE5, requiring the experience in applying modern numerical simulation tools in multidisciplinary problems of engineering and applied sciences.

Overall, the panel appreciated the high standards for teaching and learning applied by the school, and stated that all the programmes presented here are conceived and implemented at state-of-the-art international level. However, the panel considered the list of the competencies for both the master's programmes to be too long and partly too detailed to serve as a good point of reference for students and teaching staff. The panel understood that both teaching staff as well as students usually refer to the "guía docente", or syllabi, where only 2-3 programme learning outcomes are mentioned equally as the respective module learning outcomes so that there is no risk that the stakeholders will get confused by a potential long list. However, the panel recommended to shorten the list of the competencies on programme level or to sum them up/further generalize them, given that by now several competencies (e.g. Master's programme Civil engineering: AFC2, CienTec4 - Capacidad para proyectar, dimensionar, construir y mantener obras hidráulicas) could be rather module learning outcomes than programme learning outcomes.

Moreover, the panel learned that most students were not aware of the learning outcomes on programme levels, nor were the invited employers well informed about the "competence profile" or intended learning outcomes of the programmes. For the latter reason, the peers recommend further enhance the involvement of the representatives of the employers' side and of the industry, but also alumni, in the definition and development process of the learning outcomes and to make sure that students are informed in a comprehensive manner about what they are expected to achieve upon graduation.

Criterion 2.3 Learning outcomes of the modules/module objectives

Evidence:

- cf. syllabi ("guía docente") as presented on the programme-specific websites as quoted on p. 11

Preliminary assessment and analysis of the peers:

The panel learned during the audit that both students and teaching staff mostly refer to syllabi as the source of information on the courses. The peers found the syllabi to deliver complete, well understandable and up-to-date information on module/course learning

outcomes, their relevance for the overall degree competencies as stated under 2.2, the course structure (contact hours, labs, self-study time) as well as relevant basic and advanced bibliography. The panel deemed the websites of the university and the school as a whole but also of the individual programmes to be very well structured and easily readable, and especially the information/links on what materials are available for what course (course notes/slides, videolectures, former exams) is a very helpful support for students. The module descriptions are updated annually and discussed during the academic council meeting with the relevant stakeholders.

However, the information on the prerequisites for attending the modules is mentioned neither in the Spanish nor in the English syllabi. This information is very important for students, even in cases where their semester schedule is prescribed and set centrally, for cases where students fail the exam and have to retake and re-coordinate their whole schedule according to the missing prerequisites. Another information which should be completed into some of the English syllabi is the calculation of the final course mark which is explained in a very detailed way in the Spanish version but not appearing at all in the English one (cf. e.g. Mathematical Fundamentals, BA Construction engineering or Hydraulic Infrastructures, MA Civil Engineering). Since this data is very important for the successful student progression, the panel considers them to be highly useful in order to ensure transparency and handy use of the syllabi.

Whereas the Spanish version of the guía docente – syllabi – clearly indicates not only the module learning outcomes of every course ("Objetivos de aprendizaje de la asignatura"), but also the connection to the programme as a whole by stating the competences to which the course contributes ("Competencias de la titulación a las cuales contribuye la asignatura"), the panel found that the English version only indicates the module learning outcomes. Therefore panel considers adding this information to the English language syllabi to be highly advisable in order to enable maximum transparency for international students, and also in order to achieve the coherence between the Spanish and the English documentation.

Criterion 2.4 Job market perspectives and practical relevance

Evidence:

- cf. statistics on graduates employment in terms of numbers and market sector
- description of initiatives taken in order to facilitate the access to the labour market

Preliminary assessment and analysis of the peers:

Generally, it must be stated that the last economic crisis has negatively influenced the labour market for civil engineering graduates in Spain. The university reacted to the decreased demand for graduates and strongly reduced the study places for the respective programmes. In the last years, the demand started to grow again, and the School demonstrated that it can react in due time to changes at the labour market by increasing the expected intake numbers for the Civil engineering programmes accordingly.

The university showed convincingly in the self-assessment report that the programmes prepare the graduates well for the labour market, on the one hand by providing solid statistics, showing for all programmes an employment rate above 85% in the first three years of the graduation in spite of the crisis which affected the Civil engineering sector strongly The statistics available are valid only for the degrees awarded before the Bologna reform, but they allow to some extent for an analysis of the actual needs labour market.

An especially positive example for increasing the labour market perspectives of graduates is the Master's programme Numerical Methods in Engineering by foreseeing an internship in the first semester of the second year and combining this with the time for the thesis which is frequently used for participating in applied research projects emerging from the mentioned internship. Thanks to this initiative, the students benefit from an early and intensive contact to enterprises and usually find an employment without troubles (100% of the students are employed).

The other four programmes also prepare the students very well for the professional life by different means: Generally, the projects for the final thesis are usually directly related to practical issues of the professional life. There are, moreover, voluntary internships and very good relations to local and European enterprises and industrial networks. A good example for fruitful cooperation between research and industry is the UNESCO chair for Numerical Methods in Engineering, established already in 1989 which is not only actively used for general knowledge transfer and exchange but also for joint project and enhancement of mobility. Within the Bachelor's programme Geological Engineering there are several excursions, field projects and on-site works required for successful graduation - evaluated very positively by the students. As for the Bachelor's Programme Construction Engineering, which is conceived as a programme with a rather practical profile, an internship of at least 180 hours is obligatory. For the two other Bachelor's programmes, a study period abroad – either an internship or a study term - is obligatory. The same is true for students of Master's, however once they have completed the stay abroad in the Bachelor's programme already, this requirement is fulfilled.

The panel considered it very valuable that the courses of all programmes have a very high rate of self-study time and also additional hours for labs and practical lessons.

The university moreover facilitates a range of activities targeted at allowing for an early immersion into the professional activities. First of all, the practical work in the laboratories is well and coherently integrated into the teaching and learning activities. Another activity focused on better employability of the graduates is the Day of the prospective Civil engineer, a forum organized by students in the last years of their studies which is well visited by both sides – students of all cohorts as well as potential employers. The same initiative exists also for the graduates of the Geological engineering programmes. The panel also considered the workshops on writing CVs and cover letters for job applications conducted either by external experts or by the university career service to be a very positive and helpful practice.

In spite of all the above described initiatives and activities undertaken by the university with regard to the employability, both students and employers mentioned several times that the practical preparation could be further enhanced in terms of more practice-oriented teaching methods. While the panel understood that especially in the case of Bachelor's programmes of Civil engineering and Construction Engineering, there is already now a high workload (cf. for further detail 4) so that introducing obligatory practical sessions or further project-related modules could become difficult, the panel was nevertheless convinced that once the university reconsiders the overall workload according to the remarks made in section 4, the practical relevance of the programme could be further enhanced by adequate and most appropriate means.

Criterion 2.5 Admissions and entry requirements

Evidence:

- cf. Academic Regulations for Bachelor's programmes for the year 2014/2015 as of 28 April 2014: http://www.upc.edu/learning/courses/bachelors-degrees, access on 03.01.2015
- cf. Academic Regulations for Master's programmes for the year 2014/2015 as of 28 April 2014: http://www.upc.edu/learning/courses/masters-degrees, access on 03.01.2015

Preliminary assessment and analysis of the peers:

The admission regulations are treated in a very detailed way in the official document called "Academic Regulations" for Bachelor's and Master's level respectively which contain all the relevant information on assessment, enrolment, specific admission rules for people with special educative needs, and specific admission rules for certain target groups (older prospective students with professional experience, foreign students, visiting students, etc.). Additionally to these university-wide regulations, the programme manag-

ers can define programme specific admission criteria. As for the three Bachelor's programmes, no further specific admission criteria have been defined besides the expected PAU score (the average mark of the final High school exam applied for admission to all universities in Spain, or GPA) and available enrolment placements. This might be one of the reasons why the drop-out rate is rather high, and similarly, that the graduation rate is rather low. In the self-assessment report, the university provided an analysis of this result, stating the fact that the average mark required for the admission was set at a lower level compared to the cohorts before.

The analysis is supported by the fact that quite a significant part of the drop out happens already after one year due to the fact that the students do not achieve the minimum of 12 ECTS for the first year (cf. also 4). For Bachelor's of Geological Engineering, the pre-estimated drop-out rate for the first cohort will even be around 43%. Since these rates are over the average even for such traditionally highly competitive and demanding Engineering programmes, the panel still considers it worthwhile drafting a concept for sustainable reduction of the drop-out rate. Such concept might revise the practice of free admission based on the GPA only, and introduce individualized test ensuring that only well qualified candidates who really have a chance to achieve the goals of the studies are admitted.

For the Master's programmes under review, specific admission criteria are defined and presented on the programmes websites. Whereas the Master's in Civil engineering requires a passed admission test and as the analysis of submitted CVs and overall student profile, for the MA programme Numerical Methods in Engineering, the admission is decided after the analysis of the submitted CVs and academic achievements of the students by the teaching commission. This fully ensures that the programme can be implemented without any delays or without decreasing the overall level due to extremely different backgrounds of the admitted students. Here, the drop-out rates are significantly lower (5%).

Criterion 2.6 Curriculum/Content

Evidence:

- Curriculum / content overview

Preliminary assessment and analysis of the peers:

The peers deemed the presented curricula to reflect the state of the art of the science and industrial application in the respective fields and to allow for achievement of the programme learning outcomes in due time. The Bachelor's programmes under review provide a broad natural science base in the first year and partly also in the second year which is in full compliance with the expected learning outcomes (for all programmes, a solid

natural science base was foreseen). In the second year of studies, the first basics of the disciplines are introduced and first specialized modules offered, followed by the specialization modules – where applicable – in the last two study years. The panel learned that the Bachelor's programme Civil Engineering provides a very solid and thorough engineering competence in such domains as structural analysis and technology (concrete structures, steel structures), transportation systems and urbanism (roadway and railway engineering, urbanism), or geotechnical engineering, not to mention the basic education (e.g. modules engineering science and basic technology). However, it does not allow for any individual choice. All modules are mandatory, and although the panel understands that in strictly chartered professions such as Civil Engineering, it is very difficult to integrate elective options into the fully pre-defined curriculum, the peers encouraged the university to think of ways of facilitating individual choices also in the case of this programme. The same is equally valid for the programme Geological engineering where that the panel considers it to be a necessity to flexibilise the curriculum and to allow for individual choices within the framework of the defined learning outcomes. The Bachelor of Construction Engineering is more practice- than research-oriented and also a very good example for offering electives and also additional options for internships and practical projects placements which individualize the programme.

Another aspect which is missing in the curricula of all Bachelor's programmes are the transferable or so called soft skills. According to the programme learning outcomes, the graduates of all programmes are expected to develop advanced communicative and intercultural skills, but from the curriculum it is not visible how these skills are meant to be achieved. These skills are crucial for the award of the EUR-ACE label so that the panel considers the introduction of transferable skills into the curriculum a necessity. It can happen for instance by offering communication trainings, or case study based courses where students can gain practical experience of project management in teams, but also by other means, i.e. integrated in to the core subjects – as long as the consistent teaching and assessing of the skills is ensured.

The panel was also surprised that the university at the one hand requires at least a level of command of English equal to at least B2 before the students go abroad, but on the other hand does not foresee any English teaching in the curriculum nor provides at least structural support for students by e.g. facilitating participation in interdisciplinary foreign language courses.. Given that the first two years are especially demanding and after this introductory phase the students do not have a lot of time to prepare themselves for their stay abroad anymore, the School should support students' learning of a foreign language by taking additional measures leading to at least the required minimum level of linguistic command. The learning outcome – the command of the foreign language at B2 level –

could also be achieved after the stay abroad, so that the university could consider postponing the deadline for fulfilling the requirement.

The Master's degree programmes demonstrate not only a state of the art curriculum design but also elective options. For instance, in the case of the Master's of Numerical Methods in Engineering the students can choose between the specialized courses Programming for Engineers and Scientists, Advanced Discretization Methods, Coupled Problems. Here, basically only one academic year is available for courses and the rest is foreseen for the internship and the master's thesis. Similarly in the Master's programme Civil Engineering, only the first year is common whereas the second year is dedicated to the selected specialization and the compilation of the Master's thesis. This programme can be considered an example of good practice, offering a vast range of optional courses (e.g. River Dynamics, Seismic Risk Assessment and Reduction, or also Water treatment).

Although the panel gained a very positive impression of the academic performance from both student and teacher's side, several students mentioned that the teaching in the field of economy was very basic and rather unsatisfactory. They mentioned that the course was mostly repetitive, focusing on setting up balances and calculation of project expenses but leaving further aspects of engineering-relevant economics aside. This point cannot be deduced neither from varied syllabi of economics modules, nor from discussion with the teaching staff, but the panel would like to point out that apparently the satisfaction with this subject is rather low and to encouraged the university to search for reasons and possible ways of improvement.

The panel found it very convincing and laudable that the teaching staff facilitates the integration of students into the research work in a very early stage. The students commented that at the beginning of the semester the professors present their current research projects and topics and provide also some examples for student's final thesis works which could be integrated so that students can gain an impression on what topic they could concentrate on during the studies already at such an early stage (in programme where specializations are given). The teaching staff stated that the transfer of the investigation results into the teaching activities is only possible in the specializations since the obligatory parts of the curriculum are to a high extent prescribed and not variable - which would be an argument in favour of additional electives or introducing specializations.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 2:

As for 2.1, the university provided a detailed comment on the professional attributes and titles awarded upon successful completion of the programmes. The allocation at the respective levels of the EFQ remains unchanged.

As for 2.2, the university stated that all guides are available in English on the website CaminsOpenCourseWare (ocw.camins.upc.edu), which at least at the point of the compilation of the first version of this report was not always the case – some module guides were missing, as showed above. Moreover, the fact that the programme learning outcomes are accessible in the single module descriptions impedes an overview of expected competencies on programme level. It is laudable that the university is about to prepare the overview of the programme learning outcomes which is to be incorporated on the website. However, the assessment of the peers remains unchanged.

The university provided a detailed and convincing explanation why the programme learning outcomes defined for the Bachelor's of Civil Engineering and Bachelor's of Construction Engineering were handled differently (a rather basic, fundamental education in the first case, focusing on the requirements of the Master's, versus a rather technological approach, were the pre-defined programme learning outcomes were considered to reflect the profile of the programme sufficiently). The peers understand that the university is following the rules of the learning outcomes definitions as prescribed and designed by the Ministry of Science and Innovation. Still, the analysis of the peers remains valid and unchanged.

As for 2.3, the university announced a review of the module descriptions, which the panel considers laudable. The assessment remains unchanged until the module descriptions are reviewed.

As for 2.4, the analysis of the peers remains unchanged.

As for 2.5, the university explained that for the time being, neither the Ministry of Science and Innovation nor the university set the final mark, it is decided by the available offer of study placements and the number of applications. The university can neither introduce an entry examination, the only relevant requirement is the PAU, (Pruebas de Acceso a la Universidad), an equivalent of GPA, but what is done is priorising the Mathematics, Physics and Geography marks for the study entry. The university corrected the analysis of the peers concerning the admission practices to Master'a and explained that Master's admission is done by BA marks (60%), type of BA (30%) and also marks before BA (10%).

As for 2.6, the university stated that the Bachelor's programme Geological Engineering is chartered as well, and that t**he number of elective modules is restricted by the Catalan government because it increases the costs. The university also stated that** 6 ECTSs are not fixed but elective, and that some of courses can be selected from certain soft skills-seminars (e.g. National League of Universitary, Debate or Seminars for management, offered by ETSECCPB). The panel acknowledges the argumentation that in the Bachelor of Construction Engineering, "an elective of Construction Management is offered (Gestión de Proyectos y Obras" the soft skills are taught and evaluated.

Also the detailed answer on the English issue, indicating all the external offers for improving English, is only partly helpful; it is very laudable that the university of Barcelona, the cooperation partner within the Bachelor's of Geological Engineering, is offering English courses and diverse facilities for self-study. However, given that the students do not have time budget planned for English lessons, and are overloaded already now (cf. 4), the panel considers these measures not sufficient.

As for the comment on economics, university's analysis that it possibly takes place too early in the studies, might be a hint towards a sustainable enhancement and increased benefit of students. The analysis and the recommendations of the peers remains unchanged.

3. Degree Programme: Structures, Methods & Implementation

Criterion 3.1 Structure and modularity

Evidence:

- cf. curricula overview
- cf. syllabi of the modules
- Interviews with students

Preliminary assessment and analysis of the peers:

The modules of the programmes are clearly structured and divided into theoretical, practical and self-study parts as is visible for students from the syllabi. The overall programme structure allows both for taking practical placement time slots as well as international mobility for continuing studies abroad. The school has built up a very good network of international cooperation so that the cohorts are mostly very internationally mixed. Also the fact that there are several double degree programmes or Erasmus Mundus pro-

grammes at the university makes the study environment very international and encourages the students to benefit from the mobility even in the programmes where it is not obligatory. As for the Bachelor's programme Civil engineering as well as Bachelor's programme Geological Engineering, the international mobility is obligatory, and therefore the structure of the studies is well adapted for a flexible decision for taking an international mobility term.
The panel pointed out the visibility of the linguistic focus of the programmes as a point for further improvement. From the university's website, the panel gained the impression that the programmes are mostly taught in Catalan. Some websites cannot be just switched from Catalan to the Spanish or English version which could be an obstacle for incoming students. The panel therefore encourages the university to make it explicitly visible that every subject can be studied in Spanish, Catalan or English, as indicated during the interviews.
The panel found it very commendable that the university offers the Master's programme Numerical Methods in Engineering not only as a contact programme, but also as a distance learning or mixed study programme allowing for either professional activity during the study time or for better integration of family issues into the academic career.

Generally, both students as well as teachers indicated however an unusually high workload during the study term. Besides the practice of the continuous examination, one reason for this workload might be the rather short lecture period. Thus, a prolongation of the period of study and shortening the summer break, starting already in May, might be worthwhile considering in order to prolong the contact time and facilitate better preparation to for exams. Many students and teachers indicated this as a helpful measure for decreasing the workload of the last semester weeks. Also shifting some lab works or paper compilation phases to the holiday time could be one means of improving the exams, depending on what is most convenient for the successful running of the programmes.

Criterion 3.2 Workload and credit points

Evidence:

- cf. analysis of workload documentation
- Discussions with students / student's statements

Preliminary assessment and analysis of the peers:
The workload documentation as such did not deliver any concrete points for concern. The hours seem to be calculated coherently and to be clearly divided among contact hours, labs and self study, as well as exam preparation time. From the paper-based analysis the workload seems balanced, well distributed and adequate for the respective level of stud-

ies. There are extensive and very clearly written regulations for acknowledging the work performed at other Higher Education Institutions or within the framework of practical placements in cases where they are obligatory.

However, both students and teachers expressed considerable objections towards the current examination practice called “continuous assessment”, meaning de facto that from November of every academic year the students are supposed to write weekly exams of one hour or one hour and a half which are all counted as a significant part (defined in the syllabi) in the final mark for every course. The panel therefore considers the workload from teaching and learning as not too high nor too extensive, but is convinced that the practice of the continuous assessment causes significant structural overload. This aspect is treated in detail elsewhere in this report (cf. 4 Examination).

Criterion 3.3 Educational methods

Evidence:

- cf. module descriptions
- discussions with the teaching staff and students

Preliminary assessment and analysis of the peers:

The teaching staff of the School uses a range of educational methods and training tools which reflect the good practices of teaching in engineering programmes by involving simulation, lab work, field work, case studies and video lectures into the every day’s teaching activities. Also, a vast use of the virtual learning portal can be considered as a good practice where the School not only offers to access MOOCs for different thematic foci of research and teaching, but which is also used for a smooth coordination of the teaching and learning process. The panel considered the variety of the teaching methods in place to be very commendable and an example of a good practice. Also the labs, which are generously equipped (cf. also 5.3), allow for adequate and state-of-the-art teaching of civil engineering and geology. Generally, the students were also rather satisfied with the teaching as such. However, they mentioned that some subjects are taught in a rather abstract way and show less applicability to the requirements they faced during their practical placements. The panel therefore encourages the programme managers of the Bachelor’s programmes to further enhance the practical relevance of issues taught and also to revise the teaching of in the field of economy in order to increase its applicability to the requirements of the profession.

The peers understood from the interviews with students and teachers that the vast majority of students is enrolled at private academies and follows expensive exam preparation courses in order to pass the exams. This finding turned out not to be caused by un-

satisfactory guidance of the students by the teachers, but rather by the fact that most students are lacking autonomous learning skills . For this reason, the panel recommends to support students' development as autonomous learners (especially given that it is part of the learning outcomes). The planned initiative mentioned by the School's director of involving a learning coach would be very beneficial and helpful.

Criterion 3.4 Support and advice

Evidence:

- Self-assessment report
- Interview with students
- http://alumni.upc.edu/carreres-professionals/nou-programa-millora-ocupabilitat

Preliminary assessment and analysis of the peers:

There is a wide range of support and service initiatives taken by the university which very positively influence the study success of the students. Starting with the informative public website on study programme choice and very well structured information on programme design, programme duration, application requirements etc., orientation weeks for Spanish as well as international students, but also tutoring and supervising activities with assigned responsible teaching staff members for the first year of studies, the university provides a solid base for good integration of young students into the academic life. The Master's students do not have such a tutor but they indicated not to need such support given that they are already well informed in most issues of the academic life and that the programme cohorts are rather small so that the contact to the teaching staff is non-bureaucratic and easy.

For students of the last years and also students interested in practical placements, there is a career service organised by UPC alumni, including a job portal, job application workshops, personal assistance and advice as well as a range of further supporting activities targeted at facilitated integration into the labour market. The employability of the School's graduates is rather high also thanks to a variety of networking activities organized by UPC Alumni with employers, former interns and interested students which the panel considered to be very positive.

With these two activities, the initial and the final phase of studies are well organised and supported. However, the peers considered the support around the middle of the study period not always to be very satisfactory, especially as far as the obligatory study period abroad in the programmes Civil Engineering and Geological Engineering is concerned. Here, the students explained that the International Office provides no information on destination, duration, kind of partnerships etc. but is rather dedicated to incoming stu-

dents. The only information available on the exchange option is within a framework of one week where a website at the portal is opened. In this week, the students have to decide where they want to go. Some students even reported that the International Office explicitly refused to provide them any information. The panel considers this information source on such an important period of the study time to be not sufficient since concerned mandatory part of the programmes is concerned. Therefore, the panel considers it recommendable to further develop the advice infrastructure as far as international mobility is concerned.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 3:

The university provided a detailed statement on the points 3.1, 3.3 and 3.4.

As for 3.1, the university explains that based on the ECTS calculation, the workload should not be too high. However, the university acknowledges that the continuous evaluation produces a higher workload, but considers it more helpful to help students to apply their study efforts throughout the whole term and not only in the last semester weeks. The peers have provided a detailed analysis of the fact of structural pressure caused by this examination approach under 4. The assessment on the workload as such and on the structure remains however unchanged.

As for 3.3, the university representatives stated that they are very much concerned about the success of the private academies for exam preparation, and indicated that the teaching staff is working on additional materials to be spread via internal information platform, additionally to the already offered exams of passed semesters, in order to support the students. The recommendation of the peers to think of a learning coach remains however valid.

As a comment to the point 3.4, the university informed the panel that some enhancements in the field of information on mobility are envisaged (list of learning agreements concluded in the past years, etc.) or even implemented, such as the “Guia de Mobilitat” from the previous year which shows the available positions in destinations. Still, the panel recommends to think of further enhancements in the information policy, since these measures seem not to be considered as enough and satisfactory by the students.

The criterion is herewith all in all completed.

4. Examination: System, Concept & Implementation

Criterion 4 Exams: System, concept & implementation

Evidence:

- cf. syllabi
- Interviews with students and teachers
- http://www.upc.edu/bupc/hemeroteca/2009/b121/50-12-09.pdf, p. 3-4

Preliminary assessment and analysis of the peers:

The examination practice in place is clearly and transparently described in the syllabi, including the examination forms, the weighting of the examination parts as well as the calculation of the final mark. The examination forms include, depending on the subject and the expected module learning outcomes, the theoretical and practical solving of engineering problems and case studies, lab works, experiments etc. and are in their concept and variety fully satisfactory.

The examination practice of obligatory minimum requirements to credit points achievement is laid down transparently (12 ECTS in the first year, the other 48 ECTS from the first year are to be achieved at latest at the end of the second year of studies).

As for the master's thesis, the panel considered it to be positive that the university accepts a more flexible approach and allows for a period of compilation of up to 12 months, not only for special cases or unforeseen circumstances, but also due to the fact that the students pay study fees according to the credit points envisaged to be achieved after every semester, and a master's thesis with its 25 credits makes a significant part out of the whole study time.

The university management defined the practice of continuous assessment as the mandatory examination form and has consistently implemented it into all study programmes. However, during the interviews it became obvious that this practice causes structural overload of students. They stated that from November on they are supposed to write several exams weekly, whereas some of these exams are as long as the final exam (i.e. 1-1,5 hours). In some subjects, the students have to submit papers instead of writing the exams. From the workload point of view, this is comparable, given that in these cases a not submitted paper means that the assessment of the whole subject equals "failed". Accordingly, students have at least one and sometimes two exams in the week during the whole semester, even so before the final examination week. The final exam is also to be written additionally in the last week of the term.

This practice seems to be a misunderstanding of the Bologna reform since it has appeared only with the establishment of the new study programmes. Continuous assessment can and must be done differently, e.g. by submitting obligatory papers and homeworks in certain periods of time, but writing graded full exams every week in every subject is not helpful neither for students nor for teachers. The panel deemed that this practice mainly impedes successful progression in cases where students start skipping other lectures in order to gain time to prepare for another exam. Therefore, the panel sees the urgent need to change this practice and considers it a necessity to revise the concept of the continuous assessment in shortest time, since it provokes a clear handicap as far as graduate's competitiveness on the labour market is concerned: it is hardly possible in getting excellent marks under this workload scheme, which is often a requirement for the award of scholarships, decision on job placements etc.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 4:

The university informed the panel on the approaches to supervise the workload caused by the exams and also of mechanisms to avoid that the exams overlap. Thus, two exams a week is rather an exception and does not happen every week. However, the average number of 15 exams during a semester for all subjects is a really high number, even if it includes both continuous assessment and final assessment. For a 6 ECTS module, 3 examinations are foreseen, which causes a workload clearly over the average in other European institutions. The panel understands the concerns of the institution related to learning autonomy of students but deems that the aims here do not justify the applied measures. The assessment of the peers remains unchanged and a reduction of the structural pressure on the students caused by the exams is mandatory for successful accreditation.

5. Resources

Criterion 5.1 Staff involved

Evidence:

- cf. staff handbook (evidences 4.1, 4.2 and 4.6)
- list of and information about research projects in the self-assessment report

Preliminary assessment and analysis of the peers:

The university provided a very detailed analysis of the staff capacities and showed convincingly that the staffing is quantitatively as well as quantitatively sufficient and ade-

quate for the successful implementation of the programme. Among the staff qualification the panel noted a very balanced profile range, from a clear majority of Civil Engineers and other engineers (together around 67%), and 33% of all teaching staff have a background in natural sciences, so that the school has its own resources also for covering the needs from the basic education part of studies. The school has a good student-teacher ratio (about 1:8 based on the information from the SAR), especially in the Master's programmes, and the students indicated that the teachers are always available for support and advice, in spite of the fact all professors are teaching at several faculties. The panel considered the number of tenured professorships ("catedráticos") and degree holders, being more than 71% of all staff also as very positive. Also the fact that more than 50 of all professors were supervisors of PhD thesis shows a high level of qualification and also motivation of the teaching staff. During the audit, it became obvious that the teachers try to transfer as much as possible from their investigation activities to their classes, and also the students highlighted this aspect as especially positive about teaching. Furthermore, the student surveys show that they are satisfied with the quality of teaching as well as with the consultations offered on the specific subjects, but also on the general study course.

Criterion 5.2 Staff development

Evidence:

- Acceptance of non-teaching periods for research purposes
- Capacity development offers / Further education

Preliminary assessment and analysis of the peers:

The School developed jointly with the University a plan for staff development which is implemented by the Institute for Education Sciences. The most important activity foci of the institute, which directly influence the further training offer, are “planning, organization and enhancement of teaching”, “communication tools for the class room” as well as “English for Teaching staff”. As particularly helpful and positive the course on acting techniques for teaching was mentioned. The teachers showed considerable motivation and expressed their appreciation of the activities in place.

The School itself focuses at further developing the digital competence of the teaching staff by offering courses for design and creation of online contents for the study platform Camins OpenCourseWare but also for teacher’s intranet. The School created its own lab dedicated to the support of the teaching staff for implementing the digitalisation initiative.

The School pursues an internationalization policy which is also very visible in the staff development. On the one hand, a considerable part of the teaching staff received their degree from internationally renowned Civil Engineering Centers and on the other hand, the programmes for teacher’s mobility are very popular and in great demand. There is also a convincing range of international research projects where teaching staff of the School is actively involved in, allowing also for stays abroad for research purposes only.

Another School-specific policy is that the PhD students do not have a scholarship but a contract as a working investigator so that they are part of the teaching staff and their PhD can be considered as a part of staff development.

All in all, the panel considered the measures taken for staff development as adequate and beneficial for the programme implementation.

Criterion 5.3 Institutional environment, financial and physical resources

Evidence:

- Self-assessment report
- Lab visit
- Interviews with teachers and students

Preliminary assessment and analysis of the peers:

The lab visit unveiled very well equipped lab working places which are quantitatively sufficient for the successful implementation of the programmes. Just to state those which are most relevant for the programmes under review, the School has labs for Structural Technology, for Construction Material, for Sanitarian and Environmental engineering, for

Fluid Hydraulics and Dynamics, for Numeric Calculus, Geotechnics, Geophysics, and a Canal of Maritime Investigation and Experimenting.

During the audit, it became obvious that the School offers a very international learning environment, starting from attracting a considerable number of international students and also sending own students very actively to the partner institutions abroad and a range of subjects taught in English, as well as a considerable number of teachers with foreign background (about 7%). Due to all these facts, the majority of the PhD theses is already now written in English, the tendency is positive also in case of the Master's theses. The university runs five Erasmus Mundus programmes which attract additional international students from non-European countries. The School has 87 partnerships with foreign universities in 24 countries of Europe, Asia and America, 11 programmes of double degree, and is active in a range of international networks EUCEET (European Civil Engineering Education and Training, CLUSTER (Consortium Linking Universities of Science and Technology for Education and Research), TIME (Top Industrial Managers for Europe) etc., all of which contributes to the creation of the international educative setting and beneficial study conditions.

Another positive aspect about resources is the strong link between the teaching activities and industry. Firstly, there are so called industrial chairs, i.e. chairs in a field which are especially interesting and lucrative for the industry and therefore sponsored by them. Secondly, there are many research projects conducted by the professors of the School on behalf of the industry. Thirdly, several potentially employing enterprises are actively involved in the staff development and offer courses at the Center mentioned under 5.2. Fourthly, these enterprises often support gifted students with special scholarships. Fifthly, an innovative programme of joint PhD supervision by industrial companies and the School are by now accepted and supported by the Administration of Catalonia. Finally, there is a School-specific initiative supporting the development of student start-ups, called Entrepreneurial Space of the Campus Nord ("Emprèn UPC, Espai d'emprenedoria del Campus Nord"). The panel considered the relation between the employers/the industry and the School to be excellent and found the initiatives in place very laudable, being able to serve as an example of good practice.
As for the financial resources, the panel deemed them to be sufficient for the successful implementation of the programmes for the time of accreditation.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 5:

The university provided no further comment on this point; the analysis of the peers remains unchanged and the criterion is herewith fulfilled.

6. Quality Management: Further Development of Degree Programmes

Criterion 6.1 Quality assurance & further development

Evidence:

- Self-assessment report
- School's website: http://www.camins.upc.edu/escola/qualitat/qualitat, acces on 04.01.2015
- Guide for the analysis of the surveying results:

  http://www.camins.upc.edu/pdf/pdf-escola/qualitat/processos-del-sistema-de-qualitat/analisi-dels-resultats, access on 04.01.2015

Preliminary assessment and analysis of the peers:

First steps towards the system of quality assurance have been taken since 2000, established first as a process map and then developed to a system, piloted at the School as the first body of UPC. The system was successfully implemented since, and the processes are documented in the quality manual which was certified by AQU Catalunya in 2009. The panel deemed it to be mature and to incorporate all the relevant processes for the successful programme implementation and development. For the next two years, the School plans to fully introduce into the use the IT system TOTQ for better administration of data.

Criterion 6.2 Instruments, methods and data

Evidence:

- Self-assessment report
- "Plan de mejora" (enhancement plan), as presented in the self-assessment report

Preliminary assessment and analysis of the peers:

The above mentioned quality manual is clearly structured and divided into strategic processes (QA policy and QA goals, QA of academic programmes, QA of staff), fundamental processes (e.g. planning of academic programmes, administration of the career services, publication of the information on the study programmes) as well as supporting or service processes (Education of Staff, administration of resources, administration of services). In the framework of these processes, the university conducts several surveying initiatives, including e.g. student's satisfaction questionnaires, questionnaires for the internship supervisors, questionnaires for new enrolled students, as well as – which is an especially positive example – the questionnaires for secondary school students visiting the School during the Open Doors days. The methodology of data collection and analysis

is described in the guide mentioned above, and is annually discussed and updated by the responsible body, being another tool of quality assurance. Also CaminsOpenCourseWare is used to some extent. For instance, the responsible programme supervisor can double-check here the syllabi, monitor the performance in the subjects and also double-check the suggested titles of final theses.

The results of all quality assurance activities are published in the university's portal and available to all relevant stakeholders so that, all in all, the initiatives in place are considered as adequate in order to ensure the quality of the programmes. The panel, however, noticed that the response rates are rather low which is a frequent problem in internal quality assurance processes. For this reason the panel recommends revising the current questionnaire distribution practice, since both students and teachers indicated that they prefer the paper-based questionnaires to electronic ones. A survey on the acceptance of different quality assurance means and suggestions for further enhancement by all stakeholder might help increasing the response rate.

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 6:

The university is concerned about the low response rates and is seeking for the way of increasing the number of completed questionnaires. The recommendation of the peers remains valid until re-accreditation; the criterion is fulfilled.

7. Documentation & Transparency

Criterion 7.1 Relevant Regulations

Evidence:

- Academic regulations for Bachelor's programmes:

  http://www.upc.edu/learning/courses/Bachelors-degrees/bachelors-degrees-second-cycle-courses?set_language=en, access on 04.01.2015
- Academic regulations for Master's programmes:

  http://www.upc.edu/learning/courses/masters-degrees, access on 04.01.2015

Preliminary assessment and analysis of the peers:

All relevant regulations on admission, graduation and study process are easily accessible, approved by the Vice-Rector for Teaching Policy and the Vice-Rector for Studies and Plan-

ning and therefore currently valid. All subject-relevant rules and regulation are also easily accessible on the programme websites.

Criterion 7.2 Diploma Supplement and Certificate

Evidence:

- n/a

Preliminary assessment and analysis of the peers:

The university does not issue a Diploma Supplement for the time being. Since it is a requirement of the ECTS Users' Guide, the panel considers the Diploma Supplement to be absolutely necessary and requires the university to submit a draft version before the final approval providing the following information:

- structure, level and contents of the study programme
- Individual's performance, including a statement on how the final grade was calculated
- Statistical data on the cohort's performance

Final assessment of the peers after the comment of the Higher Education Institution regarding criterion 7:

As for 7.2, the university stated that no diploma supplements are issued for the time being, the School managers will turn to the University managers in order to speed up the process of designing the Diploma Supplement. It is mandatory and absolutely necessary to provide graduates with diploma supplements, one of key instruments of the Bologna reform, which is herewith the requirement for the successful accreditation.

D Additional Documents

Before preparing their final assessment, the panel asks that the following missing or unclear information be provided together with the comment of the Higher Education Institution on the previous chapters of this report:

D 1. English-language translation of the learning outcomes for all programmes

E Summary: Peer recommendations (27.02.2015)

Taking into account the additional information and the comments given by Universitat Politècnica de Catalunya in Barcelona, the peers summarize their analysis and **final assessment** for the award of the seals as follows:

Degree Programme	ASIIN seal	Subject-specific Label	Maximum duration of accreditation
Bachelor's degree programme of Civil Engineering	With requirements	EUR-ACE	30.09.2020
Bachelor's degree programme of Construction Engineering	With requirements	EUR-ACE	30.09.2020
Bachelor's degree programme of Geological Engineering	With requirements	EUR-ACE	30.09.2020
Master's degree programme in Civil Engineering	With requirements	EUR-ACE	30.09.2020
Master's degree programme in Numerical Methods of Engineering	With requirements	EUR-ACE	30.09.2020

Requirements for all programmes

A 1. (ASIIN 7.2) The issue of an English language Diploma Supplement is mandatory. Statistical data on the performance of the cohort should be provided in accordance with the ECTS User Guide to assist in interpreting the individual degree.

Requirements for the Bachelor's programmes

A 2. (ASIIN 6.2) The university has to develop a concept for its reduction as well as for the sustainable increasing the graduation rate.

A 3. (ASIIN 4) The university is requested to develop a concept for reducing the structural pressure caused by the practice of continuous evaluation. The examination practice should be changed as soon as possible.

A 4. (ASIIN 2.6) The curriculum must ensure that the transferable skills are achieved. It must be ensured that students have the necessary linguistic skills before commencing the mandatory study abroad.

Requirements for Bachelor's programmes Civil Engineering and Geological Engineering

A 5. (ASIIN 2.2) The learning outcomes must be defined in a more output-related way and individualize the profiles of the programmes under review by making the specializations better visible. The programme learning outcomes should be published in a comprehensive way.

Recommendation for the MA Civil Engineering

E 1. (ASIIN 1) It is recommended to clearly state on the website that the teaching languages are Spanish and English in order to be consistent with the policy of the School to make the programmes internationally attractive and visible.

Recommendations for all programmes except MA Numerical Methods in Engineering

E 2. (ASIIN 2.2) It is recommended to enhance and further develop the learning outcomes in a continuous dialogue with the stakeholders.

E 3. (ASIIN 2.4) It is recommended to strengthen the practical relevance of the programmes by selecting and applying adequate measures.

E 4. (ASIIN 2.6) The university is requested to set up a concept for a sustainable change of the curriculum which would allow for individual choices of electives.

E 5. (ASIIN 3.3) It is recommended to implement the idea of involving a learning coach in order to assist students in developing soft skills for autonomous learning.

E 6. (ASIIN 3.4) It is recommended to develop a better information policy for the international mobility options and to offer more regular support to the outgoing students.

E 7. (ASIIN 6.2) It is recommended to further develop the survey methodology in order to assure better response rates.

Recommendation for all Bachelor programmes

E 8. (ASIIN 2.2) It is recommended to define the learning outcomes in a more output-related way and to individualize the profiles of the programmes under review by making the specializations better visible. The programme learning outcomes should be published in a comprehensive way.

Recommendation for the MA Civil Engineering

E 9. (ASIIN 1) It is recommended to clearly state on the website that the teaching languages are Spanish and English in order to be consistent with the policy of the School to make the programmes internationally attractive and visible.

F Comment of the Technical Committees

TC 03 - Civil Engineering, Surveying and Architecture (03.03.2015)

Assessment and analysis for the award of the ASIIN label:

The Technical Committee Architecture, Civil Engineering and Survey discussed the procedure and followed the assessment of the peers without any changes.

The Technical Committee 03 – Civil Engineering, Surveying and Architecture recommends the award of the seals as follows:

Studiengang	ASIIN-Siegel	Fachlabel	Akkreditierung bis max.
Ba Civil Engineering	With requirements for one year	EUR-ACE®	30.09.2020
Ma Civil Engineering	With requirements for one year	EUR-ACE®	30.09.2020
Ba Construction Engineering	With requirements for one year	EUR-ACE®	30.09.2020
Ba Geological Engineering	With requirements for one year	EUR-ACE®	30.09.2020
Ma Ma Numerical Methods of Engineering	With requirements for one year	EUR-ACE®	30.09.2020

TC 11 – Geosciences (18.03.2015)

Assessment and analysis for the award of the ASIIN label:

The Technical Committee Geosciences discussed the procedure. The extreme high number of exams and the structural pressure caused by the practice of continuous evaluation seemed to be the main reason that many students did not finish the programmes. From

the point of view of the Technical Committee only a concept how to reduce the structural pressure would not be a sufficient solution of the problem. Therefore it proposed to re-draft the corresponding requirement (requirement 3). Further on the Technical Committee followed the assessment of the peers without any changes.

The Technical Committee 11 – Geosciences recommends the award of the seals as follows:

Studiengang	ASIIN-Siegel	Fachlabel	Akkreditierung bis max.
Ba Geological Engineering	With requirements for one year	EUR-ACE®	30.09.2020

Requirements

A 1. (ASIIN 7.2) The issue of an English language Diploma Supplement is mandatory. Statistical data on the performance of the cohort should be provided in accordance with the ECTS User Guide to assist in interpreting the individual degree.

Requirements for the Bachelor's programmes

A 2. (ASIIN 6.2) The university has to develop a concept for its reduction as well as for the sustainable increasing the graduation rate.

A 3. (ASIIN 4) The university is requested to reduce significantly the number of exams in order to avoid the extreme structural pressure caused by the practice of continuous evaluation.

A 4. (ASIIN 2.6) The curriculum must ensure that the transferable skills are achieved. It must be ensured that students have the necessary linguistic skills before commencing the mandatory study abroad.

Requirements for Bachelor's programmes Civil Engineering and Geological Engineering

A 5. (ASIIN 2.2) The learning outcomes must be defined in a more output-related way and individualize the profiles of the programmes under review by making the specializations better visible. The programme learning outcomes should be published in a comprehensive way.

Recommendation for the MA Civil Engineering

E 10. (ASIIN 1) It is recommended to clearly state on the website that the teaching languages are Spanish and English in order to be consistent with the policy of the School to make the programmes internationally attractive and visible.

Recommendations for all programmes except MA Numerical Methods in Engineering

E 11. (ASIIN 2.2) It is recommended to enhance and further develop the learning outcomes in a continuous dialogue with the stakeholders.

E 12. (ASIIN 2.4) It is recommended to strengthen the practical relevance of the programmes by selecting and applying adequate measures.

E 13. (ASIIN 2.6) The university is requested to set up a concept for a sustainable change of the curriculum which would allow for individual choices of electives.

E 14. (ASIIN 3.3) It is recommended to implement the idea of involving a learning coach in order to assist students in developing soft skills for autonomous learning.

E 15. (ASIIN 3.4) It is recommended to develop a better information policy for the international mobility options and to offer more regular support to the outgoing students.

E 16. (ASIIN 6.2) It is recommended to further develop the survey methodology in order to assure better response rates.

Recommendation for all Bachelor programmes

E 17. (ASIIN 2.2) It is recommended to define the learning outcomes in a more output-related way and to individualize the profiles of the programmes under review by making the specializations better visible. The programme learning outcomes should be published in a comprehensive way.

Recommendation for the MA Civil Engineering

E 18. (ASIIN 1) It is recommended to clearly state on the website that the teaching languages are Spanish and English in order to be consistent with the policy of the School to make the programmes internationally attractive and visible.

G Decision of the Accreditation Commission (27.03.2015)

Assessment and analysis for the award of the ASIIN seal:

The Accreditation Commission discussed the procedure. Regarding the numbers of exams it followed the assessment of the Technical Committee 11 – Geosciences that only a concept how to reduce the structural pressure would not be a sufficient solution of the problem. Therefore it adopted the proposal of the Technical Committee to change the requirement. Additionally the Accreditation Commission only took some changes of the wording of some requirements and recommendations to clarify the issue.

Assessment and analysis for the award of the EUR-ACE Label:

The Accreditation Commission for Degree Programmes stated that all programmes fulfil the field specific criteria of the technical committee 03 and awarded the EUR-ACE Label for all programmes.

The Accreditation Commission for Degree Programmes decides about the award of the ASIIN Seal and the EUR-ACE Label as follows:

Studiengang	**ASIIN-Siegel**	**Fachlabel**	**Akkreditierung bis max.**
Ba Civil Engineering	With requirements for one year	EUR-ACE®	30.09.2020
Ma Civil Engineering	With requirements for one year	EUR-ACE®	30.09.2020
Ba Construction Engineering	With requirements for one year	EUR-ACE®	30.09.2020
Ba Geological Engineering	With requirements for one year	EUR-ACE®	30.09.2020
Ma Ma Numerical Methods of Engineering	With requirements for one year	EUR-ACE®	30.09.2020

Requirements for all programmes

A 6. (ASIIN 7.2) A Diploma Supplement in English language has to be issued. Statistical data on the performance of the cohort should be provided in accordance with the ECTS User Guide to assist in interpreting the individual degree.

Requirements for the Bachelor's programmes

A 7. (ASIIN 6.2) The university has to develop a concept for the reduction of the dropout rate as well as for the sustainable increasing of the graduation rate.

A 8. (ASIIN 4) The university is requested to reduce significantly the number of exams in order to avoid the extreme structural pressure caused by the actual practice of examination.

A 9. (ASIIN 2.6) The curriculum must ensure that the transferable skills are achieved. It must be ensured that students have the necessary linguistic skills before commencing the mandatory study abroad.

Requirements for Bachelor's programmes Civil Engineering and Geological Engineering

A 10. (ASIIN 2.2) It is required to define the learning outcomes in a more output-related way. The programme learning outcomes should be published in a comprehensive way.

Recommendations for all programmes except MA Numerical Methods in Engineering

E 1. (ASIIN 2.2) It is recommended to enhance and further develop the learning outcomes in a continuous dialogue with the stakeholders.

E 2. (ASIIN 2.4) It is recommended to strengthen the practical relevance of the programmes by selecting and applying adequate measures.

E 3. (ASIIN 2.4) It is recommended to strengthen the practical relevance of the programmes by selecting and applying adequate measures.

E 4. (ASIIN 2.6) It is recommended to set up a concept for a sustainable change of the curriculum which would allow for individual choices of electives.

E 5. (ASIIN 3.3) It is recommended to implement the idea of involving a learning coach in order to assist students in developing soft skills for autonomous learning.

E 6. (ASIIN 3.4) It is recommended to develop a better information policy for the international mobility options and to offer more regular support to the outgoing students.

E 7. (ASIIN 6.2) It is recommended to further develop the survey methodology in order to assure better response rates.

Recommendation for the Bachelor Construction Engineering

E 8. (ASIIN 2.2) It is recommended to define the learning outcomes in a more output-related way. The programme learning outcomes should be published in a comprehensive way.

E 9. (ASIIN 2.2) It is recommended to individualize the profiles of the programmes under review by making the existing specializations better visible.

Recommendation for the MA Civil Engineering

E 10. (ASIIN 1) It is recommended to clearly state on the website that the teaching languages are Spanish and English in order to be consistent with the policy of the School to make the programmes internationally attractive and visible.