

UC | Universidad
de Cantabria



Study in English at UC

Academic Offer

The University of Cantabria offers a catalogue of courses taught in English that are integrated in different thematic programs. The courses are open to exchange students and it is possible to combine them with other regular courses in Spanish.

Spanish History and Culture.....4

- U** Prehistoric European Art. (6 credits) G1504 – Spring
- U** Spanish History and Culture. (6 credits) G1806 – Spring
- U** Spanish Language I & II. (6 credits) G1807 / G1825 – Spring
- U** European Culture and Civilization. (6 credits) G1808 – Spring
- U** Discovering Spanish Landscapes. (6 credits) G1811 – Spring
- U** Spanish Language II. (6 credits) G1825 – Spring
- U** An introduction to Spanish Literature and Cinema. (6 credits) G2010 – Spring

Business and Economics6

- U** Econometrics II. (6 credits) G1637 - Fall
- U** International Economics. (6 credits) G1887 - Fall
- U** International Trade. (6 credits) G1993 - Fall
- U** Public Economics. (6 credits) G2006 - Fall
- U** International Finance (6 credits) G2086 / G2087 - Fall
- U** Consumer Behaviour. (6 credits) G921 - Fall
- U** European Economic Policy. (6 credits) G1639 - Spring
- U** Economic Growth. (6 credits) G1822 - Spring
- U** Dynamic Macroeconomics. (6 credits) G1823 - Spring
- U** Economic and Financial System. (6 credits) G1886 - Spring
- U** Economics of Social Expenditure. (6 credits) G2009 - Spring
- U** International Business Economics. (6 credits) G965 - Spring
- U** Creation of Companies and Family Business. (6 credits) G1638 / G1640 - Spring
- U** Business Management Techniques: Good Practices. (6 credits) G1813 - Spring

- U** Open Economy Macroeconomics. (6 credits) G1814 - Spring
- U** International Business: A European Perspective. (6 credits) G1815 - Spring
- U** Statistical Methods in Economics and Business. (6 credits) G1817 - Spring
- U** International Business. (6 credits) G1818 – Spring

Chemical Engineering10

- U** Product Design Project. (6 credits) G1772 - Fall
- U** Chemical Kinetics and Reactor Design. (6 credits) G1774 - Spring
- U** Analysis of Separation Processes. (6 credits) G1780 - Spring
- U** Dynamics and Control of Chemical Processes. (6 credits) G784 - Spring
- U** Advanced Separation Processes. (6 credits) G787 - Spring
- U** Wastewater Treatment. (6 credits) G795 - Spring
- U** Life Cycle Assessment. (6 credits) G799 - Spring
- U** European Project Semester. (30 credits) G1636 – Spring
- M** Emerging Technologies in Chemical Engineering (3 credits) 1051 - Spring
- M** Knowledge Dissemination in Chemical Engineering (3 credits) 1056 – Spring

Civil Engineering13

- U** Introduction to Geotechnical Engineering. (6 credits) G1446 - Fall
- U** Hydrology. (6 credits) G1448 - Fall
- U** Engineering Computation. (6 credits) G1462 - Fall
- U** Strength of Materials. (6 credits) G1463 - Fall
- U** Spanish Course. (6 credits) G1502 - Fall
- U** Geology. (6 credits) G1627 - Fall
- U** Calculus. (6 credits) G2007 – Fall



The Program also offers, in a compatible timetable with the technical courses:
Spanish Course (6 credits) G1502 – Fall

- U** Fluid Mechanics. (6 credits) G1445 - Spring
- U** Introduction to Business Administration. (6 credits) G1447 - Spring
- U** Mechanical Properties of Materials, Processing and Design. (6 credits) G1449 - Spring
- U** Geotechnical Engineering: Foundations, Excavations and Tunnels. (6 credits) G1465 - Spring
- U** Structural Analysis. (6 credits) G1450 - Spring
- U** Construction of Civil Infrastructure. (6 credits) G1464 - Spring
- U** Coastal Engineering. (6 credits) G1466 - Spring
- U** Energy Systems. (6 credits) G1467 - Spring
- U** Environmental Engineering. (6 credits) G1468 - Spring
- U** Heat Transfer and Two-Phase Flow. (6 credits) G1501 - Spring
- U** Uncertainty Analysis in Engineering. (6 credits) G1503 - Spring
- U** Engineering Economics and Management. (6 credits) G1569 - Spring
- U** Programming. (6 credits) G2008 - Spring
- U** Mechanical Properties of Materials, Processing and Design (6 credits) G2011 – Spring

Education..... 19

- U** Development of Speaking and Writing Skills in Contexts of Content and Language Integrated Learning (CLIL) in Bilingual Contexts. (6 credits) G1469 - Fall
- U** Development of Oral Comprehension and Expression in English through Stories, Songs and Games. (6 credits) G1551 - Fall
- U** Energy in the World Today. (6 cr) G1675 - Fall
- U** Acquisition of English as a Foreign Language. (6 credits) G518 - Fall
- U** Methodology and Resources for English Teaching. (6 credits) G519 - Fall
- U** Morphosyntax and Semantics of the English Language. (6 credits) G520 – Fall

- U** Development and Teaching of Mathematical Reasoning. (6 credits) G1746 - Spring
- U** Writing didactics and Children’s Literature. Age 0-6. (6 credits) G1896 - Spring
- U** English Phonetics. (6 credits) G563 - Spring
- U** English Language and its Didactics. (6 credits) G564 - Spring
- M** Development of Second Language Communicative Skills: Reading and Writing. 912 Fall (3 ECTS)
- M** Development of Second Language Communicative Skills: Listening and Speaking. 911 Fall (3 ECTS)
- M** Development of Second Language Phonetic and Lexical Competence. 908 Fall (3 ECTS)
- M** Development of Second Language Grammatical Competence. 909 Fall (2 ECTS)
- M** Development of Second Language Pragmatic and Discursive Competence. 910 Fall (3 ECTS)
- M** Language Acquisition Research Methodology. 919 Fall (3 ECTS)
- M** Second Language Teaching: Methodology and Teaching Materials. 916 Fall (4 ECTS)
- M** Literature and Cinema as a Didactic Tool in the Language classroom. 918 Fall (3 ECTS)
- M** Assessment and Foreign Language Teaching According to the CEFR for languages. 917 Spring (3 ECTS)
- M** Information and Communication Technologies in Second-Foreign Language Teaching. 921 Spring (3 ECTS)
- M** Current Approaches to Bilingualism and Second Language Acquisition 922 Spring (3 ECTS)
- M** Content and Foreign Language Integrated Learning. 907 Spring (3 ECTS)
- M** Bilingual Education: Policy, Programmes and Practice in the Spanish and European Context. 914 Spring (3 ECTS)
- M** Teaching of Languages for Specific Purposes. 915 Spring (3 ECTS)
- M** Research Project Design 913 Spring (6 ECTS)



Health Sciences.....22

- U** Medical English. (6 credits) G132 - Fall
- U** Community Health Care. (6 credits) G1634 - Spring
- M** Workshop of Biomedicine. (5 credits) 450 - Fall
- M** Genetic Engineering and Biotechnology. (5 credits) 435 - Fall
- M** Current Advances and Future Trends in Molecular and Cellular Microbiology (5 credits) 431 - Fall
- M** Molecular Bases of Cell Proliferation, Differentiation and Death. (5 credits) 440 - Fall
- M** Structure of Macromolecules. (5 credits) 447 - Fall

History and Geography24

- U** Prehistory of the Iberian Peninsula I (6 credits) G1830 Fall
- U** Geographic Information Systems II (Vector-Based) (6 credits) G184 - Spring
- U** Prehistory of the Iberian Peninsula II (6 credits) G213 Spring

Industrial Engineering and Telecommunications25

- U** Medium and Low Voltage Electrical Installations. (6 credits) G1674 - Fall
- U** Materials. (6 credits) G1901 - Fall
- U** Industrial Chemistry. (6 credits) G716 - Fall
- U** Electrical Drives. (6 credits) G875 - Fall
- U** Further Power Electronics. (6 credits) G1010 - Spring
- U** Industrial Robotics and Computer Vision. (6 credits) G1013 - Spring
- U** Energy and Telecommunications. (6 credits) G1895 - Spring

Maritime Engineering27

- U** Maritime Technical English. (6 credits) G1055 - Fall
- U** Technical English. (6 credits) G1091/G1119 - Spring
- U** English as a Communication Tool in the Professional Sphere. (6 credits) G1308 - Spring

Mines and Energy Engineering 26

Location: Torrelavega Campus.

- U** Renewable and Alternative Energies. (6 credits) G605 - Fall
- U** Environmental Technology in Mining. (6 credits) G629 - Fall

Physics, Mathematics & Computer Science 28

- U** Computer Animation and Video Games. (6 credits) G1749 - Fall
- U** Advanced Probability. (6 credits) G1894 - Fall
- U** Advanced Experimental Techniques (1C). (6 credits) G79 - Fall
- U** Advanced Computation. (6 credits) G80 - Fall
- U** Advanced Statistics. (6 credits) G1903 - Fall
- U** System and Network Security and Assurance. (6 credits) G1828 - Spring
- U** Natural Language Processing. (6 credits) G687 - Spring
- U** Measure Theory. (6 credits) G1902 - Spring
- U** Advanced Experimental Techniques (2C). (6 credits) G1775 - Spring
- U** Astronomy. (6 credits) G1776 - Spring
- U** Particle Physics. (6 credits) G1777 - Spring
- U** Experimental Optics. (6 credits) G1778 - Spring



The aim of this Program is to provide students with an overview of the Spanish historic, artistic and linguistic contemporary reality in order to deepen their knowledge of Spanish language and culture, which will help them initiate other studies in Spanish and/or complete their humanistic, scientific, experimental and social knowledge.

For non-native students B2 level of English is recommended. Unit Courses (6 ECTS)

U Spanish History and Culture G1806 - Spring

Students are introduced to different aspects which are fundamental for the correct understanding of the Spanish History. This course examines the major turning points in Spanish History beginning with the Prehistory, the Pre-roman and Roman conquest, the Visigothic Kingdom, the Muslim invasion and the Christian Reconquest, the birth of the Spanish Language, the Catholic Monarchs, the Discovery of America and the Spanish Golden Age, the monarchy and the Spanish Empire, The Independence of Latin America, Spanish America war of 1898, 11 Republic, Civil War and Dictatorship, the Transition to Democracy and Finishing up to the modern day.

U Discovering Spanish Landscapes G1811 – Spring

This course will show students how diverse the Spanish territory is, attending to different geographical points of view. At the end of the course, students will have to be able to distinguish different physical and human landscapes of Spain. The main aim will be to identify and describe different landscapes in Spain from a physical, social, urban and economic approaches. In order to achieve this general aim, students will be able to seek, deal and analyse geographic information.

U Spanish Language I and II G1807 – Spring / G1825 – Spring

1. A communicative and capacity for argument, debate and cooperative work with colleagues, Family and other educational agents and community services to generate a positive school climate and to develop these capacities in their students.
2. Capacity for oral and written expression in a Spanish language.
3. Approaching effectively language-learning situations in multicultural and plurilingual contexts. Encouraging the reading and critical commentary of texts from the diverse scientific and cultural domains contained in the school curriculum.
4. Acquisition of level B2 in the Spanish language. Students should be able to convey information, ideas, problems and solutions to a specialised and non-specialised audience.



U An Introduction to Spanish Literature and Cinema G2010 – Spring

The course is a general introduction to the most important facts about Spanish Literature and Cinema. We will consider the most important Spanish books and films from an aesthetic as well as from a cultural point of view. Therefore, particular attention will be paid to contemporary works as a way to understand the complexities of Spanish culture. We will also use a comparative approach to deal with the global impact of Spanish culture from a transnational point of view.

U European Culture and Civilization G1808 – Spring

The course will deal with the concepts of culture and European unity and diversity. Therefore, the different concepts of culture and the diverse dimensions of Europe (geographical, historical, religious, economic, cultural) will be analysed and followed by an individual analysis of the culture and civilization of some specific European countries. The course will cover some of the following areas: Background, situation, languages, sociological overview, Education, Religion, Economy, Politics, the Media, cultural conflicts, cultural products (Literature, Cinema, Art). The course will also present key facts about the creation and development of the European Union.

U Prehistoric European Art G1504 – Spring

Study of the historic development of the primitive societies of hunter-gatherers of the European Upper Palaeolithic, their transformation in time and their artistic production. Study of the initial processes and the consolidation of the early European Farming societies and their artistic production.



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FALL

U Consumer Behavior

G921 – Fall

The course deals with the understanding of customers' decision-making process and influencing factors, the description and impact of economic, individual and social factors; and the models of consumer behaviour.

U International Finance

G2086/G2087 – Fall

The objective of the course is to provide the student with the necessary instruments to interpret the concepts and models of Financial Theory in the context of international relations and analyse practical situations in exchange rate risk management.

Courses within the Advanced Diploma in Economics:

If you stay the whole year and pass 5 of the courses within the Diploma, you will get the Advanced Diploma in Economics

U Public Economics

G2006 – Fall

****time conflict with G1993 ****

This course aims to explore key concepts in public economics and the effects of government intervention in the economy. It covers the theorems of welfare economics, examines major market failures, and evaluates the most suitable tools for public

intervention in economy: expenditures and revenues.

U International Economics

G1887 – Fall

This advanced macroeconomics course requires prior knowledge of closed-economy dynamics. It will explain the key differences between closed and open economies and then focus on the economic performance of open economies.

U Econometrics II

G1637 – Fall

This course can be considered as an intermediate undergraduate course in Econometrics. The course will introduce new techniques that are already needed for many applied economics problems such as Policy Evaluation and Impact Analysis. Among these techniques we emphasize Panel Data Analysis and Instrumental Variables Techniques (IV).

U International Trade

G1993 – Fall

**** time conflict with G2006 ****

This course focuses on understanding the reasons behind international trade, trade patterns, and the impacts of free trade on income distribution and social welfare. It covers the effects of trade on economic growth, income transfers, international labour migration, foreign trade outsourcing, and current trade policy disputes. The course includes theoretical lessons and applied problem sets.



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SPRING

U Creation of Companies and Family Business G1638/G1640 - Spring

This course has two main objectives. First, it aims to systematize the collection of information to identify the strengths and weaknesses of a business project, considering investment resources and estimated economic effects. Second, it focuses on the unique characteristics and challenges of Family Businesses, including governance, inheritance issues, and management. Students will analyse data and propose solutions based on their findings.

U International Business G1818 - Spring

Do you know how to present your business card in Japan? In this course, you will learn about risk assessment and cultural differences of other countries, learning to do business according to their characteristics. You will also learn the casuistry (risk, culture) of the major powers in North America, Asia and the European Union as well as the different strategic options for multinational companies (management, alliances, strategies).

U International Business: A European Perspective G1815 - Spring

This course examines how the activities and results of large companies are influenced by decisions and strategies of corporations, industries, governments, and institutions at regional, national, and international levels. It takes an analytical approach to studying International Business from the European Union's perspective, emphasizing practical work and case studies.

U Open Economy Macroeconomics G1814 - Spring

Open Economy Macroeconomics introduces students to International Economics from a monetary perspective, focusing on small open economies. Topics include the exchange rate and its determinants, how the economy responds to exchange rate changes, and the reactions of small open economies to various shocks and policy measures.

U Statistical Methods in Economics and Business G1817 - Spring

This undergraduate course includes topics such as Probability and Statistical Inference, Point and Interval Estimation, the Maximum Likelihood Method, Hypothesis Testing, Likelihood-ratio Tests, Bayesian methods, Nonparametric methods, Analysis of Variance, Regression Analysis, Correlation, and Chi-square goodness of fit tests.



U Business Management Techniques: Good Practices G1813 - Spring

This course adopts an analytical and practical approach to Business Management, covering Marketing, Accounting, Information and Communication Technologies, Management Operations, and Organizational Behaviour. It emphasizes applications and case studies in both classroom settings and coursework. Students are expected to actively participate in class and working groups, especially during case study discussions.

U European Economic Policy G1639 - Spring

This course prompts students to contemplate economic theory, leading to a variety of potential economic policy choices for European Union countries. It examines the implementation of economic policies and their international repercussions. As a Jean Monnet Module since 2015/2016, it incorporates innovative teaching approaches. Students engage in the EUCitizensLab, analysing policy effects on EU citizens and producing EUPolicy Videos for YouTube. The top 5 students earn a trip to Brussels institutions.

U Dynamic Macroeconomics G1823 - Spring

This course is an introduction to dynamic macroeconomic models as a tool to address macroeconomic questions and policy evaluation. Within this framework several important theoretical results related to consumption, fiscal policy, public pensions and business cycles are analysed. The course provides the base for other advance courses such as Economic Growth and Monetary and Financial Economics.

U Economic Growth G1822 - Spring

This course is designed to enhance students' understanding of the dynamics of economic growth in countries. It focuses on providing theoretical knowledge to comprehend the causes and determinants of economic growth, aiming to develop policies conducive to prosperity and improved living standards. The course follows a chronological review of major economic growth theories, supplemented with practical problem sets for application.

U International Business Economics G965 - Spring

In today's globalized world, understanding the economics of International Business is crucial for professionals across various fields such as business administration, economics, and law. This course aims to provide students with a comprehensive understanding of Business Economics in a global context. Students will learn to analyse the complexities of the world economy and business environment, focusing primarily on the firm's operations in theory and practice within an international context.



U Economic and Financial System G1886 - Spring

This course delves into the intricacies of the financial system, comprising institutions, instruments, and markets, which facilitate the flow of capital from savers to investors to fuel productive investments and foster economic growth. The course focuses on analysing the international financial system, with a particular emphasis on the Spanish case and recent global financial crises. It examines three key components: financial intermediaries, financial markets (including capital and money markets), and financial instruments (such as financial assets, monetary policies, and financial policies).

U Economics of Social Expenditure G2009 – Spring

This course aims to explore the economic rationale and key factors influencing social expenditure, evaluate public sector roles and funding in mixed economies, analyse the economic impacts of social expenditure, and review the latest research and developments in the field.



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U Life Cycle Assessment G799 - Spring

Life Cycle Assessment (LCA) is a well-known methodology applied to products, processes and services which consider its Full life cycle: From the cradle (as natural resources) to the grave (as wastes). The course covers all aspects about how to perform an LCA study: definition of the goal and scope as well as the target audience, gathering data on resource consumption and emissions, burdens to the environment, checking the robustness and significance of results and conclusions, and reporting and reviewing to ensure transparency and quality. This LCA course includes LCA Fundamentals as well as practical activities based on group projects. For the project development, the students learn how to use commercial LCA software.

U Wastewater Treatment G795 - Spring

This course provides the basic knowledge on wastewater treatment necessary to be able to successfully afford issues related to wastewater treatment, new water sources, desalination, sustainable management of water resources, etc. At the end of the semester the student should be able to: i) understand the current situation of demand and water availability, ii) conceptualize conventional wastewater treatment processes, iii) conceptualize process of obtaining reclaimed water and desalinated water and, iv) discriminate alternatives for water reclamation and desalination using sustainability criteria.

U Advanced Separation Processes G787 - Spring

This course covers the Fundamentals and applications of rate-controlled separation processes: membrane-based separation processes and solid-Fluid separations. The specific objectives to be achieved by the students are: i) to know and understand from a qualitative and quantitative point of view the phenomena taking place in membrane units and adsorption/ion exchange columns and, ii) to identify and compare advanced separation processes on their application in solving separation problems in the context of industry and environment. The course includes small-group laboratory assignments.

U Analysis of Separation Processes G1780 - Spring

This course covers the analysis and design of separation processes involving phase equilibria and mass transfer. Among the equilibrium-controlled separation processes, distillation, gas absorption/stripping and liquid-liquid extraction are studied. With respect to rate-controlled separation processes, special attention is paid to membrane-based separation processes as well as other advanced separation technologies such as adsorption. In addition, students will acquire the following transversal concepts and competences: continuous and batch processing, counter-current and co-current flow patterns, separation equipment, modelling of the performance of various separation systems, optimization of the



design of separation systems to achieve targets for product purity, experience using modern computer software for designing separation processes and ability to develop and apply criteria for selecting among available separation technologies.

U Dynamics and Control of Chemical Processes G784 - Spring

The course provides an appropriate balance of dynamics and control theory and practice, the latter is developed through case studies and one mini group project. Part I provides an introduction to process control and in-depth discussion of dynamic process modelling, based on basic principles of mass and energy conservation. Part II is concerned with the analysis of the dynamic (unsteady-state) behaviour of processes. In addition, the important topics of empirical models and their development from plant data are presented. Finally, Part III addresses the Fundamental concepts of Feedback and Feedforward control. The topics include an overview of the process instrumentation that is necessary to implement process control: chemical composition, pressure, temperature, Flowrates, Final control elements. Chemical engineers need to master "Process Control" in order to be able to design and operate modern plants.

U Chemical Kinetics and Reactor Design G1774 - Spring

This course covers the fundamentals of chemical reaction kinetics and the principles of reactor design for chemical processes. The specific objectives to be achieved by the students are: i) to know and understand the fundamentals of chemical reaction kinetics in homogeneous reac-

tions, ii) to identify the mathematical relationships between the operation variables and the kinetic parameters to describe the kinetic behaviour of reactive systems, iii) to know the performance, design and optimization of ideal homogeneous reactors, iv) to develop and solve the mass, energy and momentum balances in ideal homogeneous reactors, and v) to understand and describe the performance of chemical reactors with deviations from ideal flow patterns. The subject consists of a theoretical part (60%) and a practical part (40%) developed in a computer simulation lab.

U European Project Semester G1636 - Spring

This is a unique course of 30 ECTS aimed to integrate the fundamentals of chemical engineering disciplines for the optimum design of environmental, biotechnological and industrial processes. Along the semester students will take 3 regular courses G787 Advanced Separation processes, G795 Wastewater Treatment and G799 Life Cycle Assessment and will end up with the completion of the Final Degree Project. Approximately half of the scheduled time will be devoted to the development and acquisition of practical skills both in computer rooms working with specialized software as well as in laboratory working with bench scale set-ups. Team-working in multidisciplinary and international groups is favoured as an important part of the training program that for the assessment requires preparation of written reports and oral presentations. The list of projects' proposals is renewed every year to match the training program to technical and scientific topics of actual interest.



U Product Design Project G1772 - Fall

The educational system in chemical engineering has in the past been focusing mainly on process design. In the last years the attention of product design has increasingly been much more importance. The changes in chemical, molecular, materials, and nano engineering have made the development of a whole new range of functionalised and specialised products possible. The aim of this course is to introduce the students to the structured approach of designing a chemical product. After a thorough introduction of the product concept design path (following the tradition of Cussler and Moggridge) the course utilizes several case studies of product design in order to introduce the concepts of specialty chemicals, micro- and macrostructured products and devices for chemical changes. Different methodologies are used: i) team work, ii) seminar by professional from industry, iii) visits and iv) use of real examples.

M Master's Degree in Chemical Engineering

These courses are also open to exchange students and it is possible to combine them with other regular courses in Spanish. For non-native students a B2 level of English is re-commended. Unit courses (3 ECTS)

M Emerging Technologies in Chemical Engineering 1051 - Spring

The aim of the subject is to provide a novel approach through study cases of novel applications and technologies where chemical engineers play a decisive role. During the course, potential applications of Chemical Engineering in emerging sectors such as nanotechnology and biomaterials will be analysed. In this regard, the main learning outcomes focus on providing technical alternatives to solve environmental, industrial and social problems and on applying the fundamentals of Chemical Engineering to solve problems in related areas such as biomedicine and material science.

M Knowledge Dissemination in Chemical Engineering 1056 - Spring

This subject aims to provide the guidelines to elaborate in an adequate way and with certain originality develop reasoned arguments and written scientific/technical documents, such as scientific papers and technical reports, or to make reasonable assumptions. Students who overcame this subject will be able to publicly present ideas, procedures or research reports, convey emotions or give advice to individuals and organisations. In addition, analysis of results and the management of databases in the field of Chemical Engineering will be covered by the course.



The following courses are part of the Exchange program in Civil Engineering between the UC and Cornell University, and of the fourth year of the Bachelor in Civil Engineering. They can be available to exchange students and can also be combined with regular courses in Spanish. For non-native students B2 English Certificate is required. Unit courses (6 ECTS)

FALL

U Calculus

G2007 - Fall

Introduction to an important part of the main mathematical tools that students will need throughout their studies. The objectives include developing proficiency in mathematical language and reasoning, cultivating intellectual work habits, understanding the modelling potential of calculus, gaining operational skills in manipulating mathematical functions and their properties, comprehending and applying differential and integral calculus in single and multiple variables to physics and engineering problems, familiarizing with relevant software and programming tools for problem-solving, and instilling a commitment to independent and collaborative study.

U Engineering Computation

G1462 - Fall

The main objective of the course is to introduce numerical methods as a fundamental tool for engineering disciplines. We plan to review some main topics of Numerical Algebra (matrix calculations, systems of equations, ...) and Numerical Calculus (root finding, interpolation, differentiation and integration, numerical methods for initial and boundary value problems in differential equations, ...), working with computational efficiency and controlling the errors. Computer tools and programming will be important; we will use software widely used in engineering and science (MATLAB, ...)

U Introduction to Geotechnical Engineering

G1446 - Fall

The aim of this course is to provide students with the basis to understand soil and rock mechanics. They will learn to classify soils, how to calculate pore water pressures under hydrostatic and steady flow conditions and how to get total and effective stresses. In addition, they will learn about strength and deformability of soils under drained and undrained conditions. They will understand the different laboratory tests such as direct shear test, triaxial test, unconfined compression test, and oedometric test. Finally, they will get to know some failure criteria for rocks and some test to characterize their strength and deformability.

U Geology

G1627 - Fall

This subject covers the main properties of rocks with an emphasis on problems and applications to engineering projects. Rocks and discontinuities are the key elements of rock mass and the subject will cover the principles of bedrock classification based on these criteria. There is also an introduction to Geomorphology and its application to engineering projects. The course includes practical activities focused mainly on geological maps but also aerial photography and identification of rock samples.



U Hydrology G1448 – Fall

This course studies the hydro logical cycle and phenomena involved in it. It discusses methods for measuring flow in a section of a watercourse; hydrographs are studied and the methods for their determination and for their transit through stretches of rivers and reservoirs and are determined maximum flows in both the general case and in cases such as urban hydrology and drainage of roads. Finally, we study basic aspects of Hydrogeology and movement in porous media.

U Strength of Materials G1463 - Fall

The course presents the basic concepts related to the analysis and design of structural members subject to tension, compression, torsion and bending. Specific topics includes: stress and strain, deformations and displacements, elasticity and plasticity, stresses in beams, deflections of beams, internal forces diagrams, statically indeterminate beams, composite beams, energy methods.

The Program also offers this Spanish course in a compatible timetable with the technical courses:

U Spanish Course G1502 - Fall (6 ECTS)

SPRING

U Engineering Economics and Management G1569 - Spring

At the end of this course the student will be able: To rigorously formalize the decisions inherent to his technical work to justify and to defend the elections he proposes. To include in his analytical framework economic concepts as inflation, taxation, depreciation, financial planning, economic optimization. To analyse and discuss the selections made by others. To understand the economic consequences derived from their personal decisions about savings, investment, retirement...

U Geotechnical Engineering: Foundations, Excavations and Tunnels G1465 - Spring

This course examines site characterization and geotechnical aspects of the design and construction of foundation systems, earth retaining structures and slopes. Application of soil mechanics in the analyses and design of these geotechnical structures is presented. Topics include: site investigation (with emphasis on in situ testing), rock mechanics, deep foundations (piles), earth retaining structures, excavations and fills: slope stability.



U Introduction to Business Administration G1447 - Spring

At the end of the course the student, will first be able to understand the basic economic restrictions affecting the engineer's work, being familiar with macroeconomic conditions of the society, and with microeconomic mechanisms explaining individual behaviour. Second, he will be familiar with the basic economic analytic instruments used in business as accounting, finance, operational research and engineering economic analysis. Finally, he will understand the basic organizational framework rules governing complex organizations and managing human resources.

U Structural Analysis G1450 - Spring

The main objective of this course is to present both the conceptual analysis of structures and its computational approach based on matrix analysis and finite elements. Topics include: analysis of trusses; analysis of frames; virtual work and unit load method; basic concepts of structural stability; influence lines and introduction to the finite element method.

U Construction Materials G2011 - Spring

The aim of this course is to provide the student with the basis to understand the different models of mechanical behaviour of materials used for structural purposes. The main objectives are three. First, get the knowledge of the experimental techniques that allow the determination of the properties of construction materials. Second, know the types of structural steels and the existing strategies to modify their mechanical properties. Finally, review the different manufacturing and installation processes of constructions materials and, in particular, the methods of design, production and placement of concrete.

U Heat Transfer and Two-Phase Flow G1501 - Spring

The main objectives of this course are to present the fundamentals of heat transfer, to obtain a deep view of the heat transfer processes, in steady and unsteady conditions and in one and more dimensions and to learn about the theory and different practical approaches –including numerical heat transfer analysis- of the sources of heat transfer: conduction, convection and radiation. The students will also obtain the ability to solve heat exchangers and extended surfaces problems and to obtain the necessary skills to carry out engineering design involving heat transfer.



U Environmental Engineering G1468 - Spring

The course provides the students with the basic knowledge to understand and solve Environmental Engineering issues. It introduces the basic biological, chemical and physical processes of relevance in the field, stressing the mass balance and transport concepts. These principles are analysed and applied to the main areas of Environmental Engineering: air and noise pollution, solid waste management, water treatment, water quality and wastewater treatment.

U Energy Systems G1467 - Spring

This course introduces energy systems with emphasis on design and costs. The course presents a systems approach to energy needs, covering carbon-based, nuclear, and renewable energy sources, including solar energy, small scale hydro-power, wind, bio-conversion processes, and house energy balances.

U Uncertainty Analysis in Engineering G1503 - Spring

The course introduces the analysis of variability and uncertainty in science and engineering. Techniques for measuring, describing, and controlling variability are considered. This includes descriptive statistics and data analysis, concepts of probability, the main probability distributions, extreme value analysis, point and confidence interval estimation, hypothesis testing and experimental design. An introduction to multiple regression is briefly outlined. Examples are mostly drawn from civil, environmental, and industrial engineering.

U Fluid Mechanics G1445 - Spring

This course covers fluid properties, fluid statics and fluid dynamics. The students will also acquire knowledge of fluid analysis through the application of control volumes, as well as differential analysis. They will understand and know how to apply Bernoulli's equation to solve different hydraulic engineering problems and will be able to solve flows in pipe systems as well as in open channels. In addition, they will receive basic training in turbulent processes and in the treatment of the boundary layers.

U Coastal Engineering G1466 - Spring

The objective of this course is to provide students with the necessary knowledge to understand the most relevant dynamics and physical processes that affect the coast and the structures present in the area. In addition, students will be able to classify different typologies of coastal structures, according to criteria of functionality and stability and will learn how to design different types of breakwaters. They will also acquire knowledge on estuarine dynamics and coastal design and protection initiatives.



U Construction of Civil Infrastructure G1464 - Spring

This course offers the student a review of the main engineering concepts related with the construction of civil infrastructure: types of civil infrastructures, machinery used in civil engineering, construction procedures and management systems in construction engineering. At the end of the course, the student will learn to allocate resources during the construction process with effectiveness and efficiency, to use interdisciplinary approach as basic mechanism of value-creating in construction engineering, to respect the built heritage and the cultural expression in construction, and to be sensitive to problems of safety and health in construction, minimizing the risks in all the activities.

U Programming G2008 - Spring

This course provides the students with the basic fundamentals of computers and operating systems. The students will learn to use the tools, processes and techniques necessary for the development and fine-tuning of computer programs. Additionally, they will be able to use development environments with application in civil engineering and techniques and tools that allow proper data management.

U Mechanical Properties of Materials, Processing and Design G1449 - Spring

The aim of this course is to provide the student with the basis to understand the different models of mechanical behaviour of materials used for structural purposes. The course is divided into two sections: The first part is focused on understanding the linear-elastic, plastic and viscous behaviour of materials. The second one pays attention to the application of fracture mechanics.



Master's Degree in Civil Engineering, Canal and Port Engineering

These courses are also open to exchange students and it is possible to combine them with other regular courses in Spanish.

Unit courses (4.5 ECTS)

M Continuum Mechanics 592 – Fall

The main objectives of the course are the understanding and mastery of the basic fundamentals of nonlinear Continuum Mechanics and its application to solid and fluid mechanics. Specifically, we will analyse the description of the deformation in a continuous medium as well as the stress state. Next, we will examine the restrictions imposed by the physical conservation laws (linear momentum, angular momentum and energy). Finally, we will apply these concepts to different constitutive equations: Elasticity, elasticity and Fluid Mechanics.

M Economic Analysis in Engineering 595 – Fall

The main objectives of the course are: Master the economic language applied to engineering, incorporating the tools of economic analysis into their discourse. Determine the advantages and disadvantages of different organisational models specific to companies. Compare different financial situations of the company, as well as investment possibilities, analysing their suitability and viability. Describe the functioning of the economic sectors closest to engineering and model the economic behaviour of the technical decisions of the company. economic behaviour of the technical decisions of the engineer.

M Coastal and Port Engineering 588 – Fall

After taking this course, students will be able to identify the characteristics of the different types of maritime structures, as well as to design the most common maritime protections used in port and coastal engineering. In addition, students will have the knowledge to assess coastal risks, specially, those linked to coastal flooding and erosion, as well as the knowledge to design, implement and manage coastal actions aimed at the restoration and regeneration of beaches, and the reduction of coastal risks.

M Coastal Processes 589 – Spring

The main objective of the course is to provide a solid foundation in the understanding and modelling of the relevant coastal processes as a first step towards engineering applications.

M Computing in civil engineering 1454 – Spring

The students will learn the computer techniques and tools (machine learning, predictive regression, classification and clustering models, Visual Programming) to solve problems in the field of civil engineering.



The University of Cantabria offers a catalogue of courses taught in English that are integrated in different thematic programs. The courses are open to exchange students and it is possible to combine them with other regular courses in Spanish.

For non-native students a B2 level of English is recommended. Unit courses (6 ECTS)

FALL

U Acquisition of English as a Foreign Language G518 - Fall

This subject aims at providing students with the basic knowledge in the field of Second Language Acquisition (SLA) from a two-fold perspective. First, it focuses on theoretical proposals coming from different fields of knowledge (linguistics, psychology, sociology, etc.), which attempt to account for the outcome and process of second/foreign language acquisition/learning. Second, it addresses research findings from the acquisition of English as an additional language. Besides, it is intended to acquaint students with the basics of research methodology in SLA. Students will learn to assess the literature in SLA and the didactic and pedagogical implications of research findings critically, as well as reflecting on their own acquisition of English. They will also design a small-scale research project in the field.

U Energy in the World Today G1675 - Fall

This course focuses on the basic concept of energy on its different forms, the understanding of the meaning, quantification, value and environmental impact of different "sources of energy" and the current situation regarding today's reserves. It also deals with the use and perspectives of different current and alternative energy proposals and the socioeconomic implications involved.

U Morphosyntax and Semantics of the English Language G520 - Fall

Aimed to Early Childhood Education and Primary Education students, this module deals with the study of the structure of the English language from its smallest unit, the morpheme, up to the largest linguistic unit, the sentence and the text, that is to say, its word structure, its basic syntactic principles, and also the different semantic networks. As future teachers, students need to know the language they are teaching deeply, in theory and in practice; as well as improve their own grammatical competence.

U Methodology and Resources for English Teaching G519 - Fall

This module offers an overview of the different methods and techniques that Early Childhood Education or Primary Education second language teachers will need in order to make educated choices and to get their own vision of the learning process. Through the study of communicative skills, both oral and written, students are encouraged to reflect on what methodology or approach to use depending on the aims of the lesson and the learners' needs in a given group.



U Development of Oral Comprehension and Expression in English through Stories, Songs and Games

G1551 - Fall

This subject explores stories, songs and games as resources for the English classroom, especially for young learners. A theoretical base for the suitability of these resources is given and backed up with varied practical activities, aiming both to improve the knowledge of English of the students themselves and also to provide material and ideas for future classroom use. Evaluation is based on a series of set pieces of work, both individual and group presentations being included.

U Development of Speaking and Writing Skills in Contexts of Content and Language Integrated Learning (CLIL) in Bilingual Contexts

G1469 - Fall

This subject, intended specifically for future early childhood and primary teachers, aims to arm students with the knowledge and tools they need to design and implement lesson plans in bilingual educational settings. The class covers background and theory on CLIL methodology and provides ample opportunity for practical application through group projects and presentations. Lessons are highly interactive and promote students' speaking and writing skills in English while at the same time exploring how to teach normal curricular subjects, such as Science, History or Art, through a foreign language in fun and innovative ways.

SPRING

U English Language and its Didactics

G564 - Spring

The aim of this course is twofold. On the one hand, the module content is designed to reinforce the linguistic competences developed in the general English module (G309), which students complete in their first year, refining and expanding these skills to reach the upper-intermediate level (B2) as intended by this course. On the other hand, the module will provide a comprehensive overview of key didactic approaches in the EFL (English as a Foreign Language) classroom, ranging from the Grammar-Translation method to current approaches like the Communicative Approach and Content and Language Integrated Learning (CLIL).

U English Phonetics

G563 - Spring

This module is intended to enhance students' phonetic awareness, promote good pronunciation habits, and develop communicative competence in listening and speaking skills in English. Students will understand the basics of English pronunciation: vowels, consonants, stress, rhythm and intonation, especially in relation to the relevant differences between the English and the Spanish sound systems. They will also become familiar with the English phonetic alphabet and phonetic transcription, which will help them recognize phonetic symbols, pronounce English intelligibly, and avoid spelling mistakes in written English by means of a better understanding of the distribution of sounds in English. Students will also be introduced to the design of teaching materials aimed at working on English language pronunciation in Elementary Education.



U Writing Didactics and Children's Literature G1896 - Spring

Literature is important in all stages of our lives. It is arguably most significant, however, during childhood when language is acquired and art appreciation and sensibility is built. Literature is one of the most important tools society has to promote these competences. In this class, we try to understand the complexities of children's literature from its conception, delimitation, definition and use, to the specific literary manifestations: poetry, theatre, short stories, young audience novels and, especially, the implications of the picture book, both as a tool to build sensibility and literary appreciation and as the way to acquire a second language.

U Development and Teaching of Mathematical Reasoning G1746 – Spring

This course aims to train pre-service teachers in early childhood education. The course comprises two parts: the first seeks to improve teachers' subject content knowledge, and the second looks to enhance teachers' pedagogical content knowledge. These two parts are covered through four primary areas of mathematics: (1) Mathematical logic, (2) Numbers, (3) Space and geometry, and (4) Quantity and measurement.

Master's Degree in Second Language Learning and Teaching

Students may select courses from this Master's Degree if they hold a B2 English certificate.



- M** Development of Second Language Communicative Skills: Reading and Writing. 912 Fall (3 ECTS)
- M** Development of Second Language Communicative Skills: Listening and Speaking. 911 Fall (3 ECTS)
- M** Development of Second Language Phonetic and Lexical Competence. 908 Fall (3 ECTS)
- M** Development of Second Language Grammatical Competence. 909 Fall (2 ECTS)
- M** Development of Second Language Pragmatic and Discursive Competence. 910 Fall (3 ECTS)
- M** Language Acquisition Research Methodology. 919 Fall (3 ECTS)
- M** Second Language Teaching: Methodology and Teaching Materials. 916 Fall (4 ECTS)
- M** Literature and Cinema as a Didactic Tool in the Language classroom. 918 Fall (3 ECTS)
- M** Assessment and Foreign Language Teaching According to the CEFR for languages. 917 Spring (3 ECTS)
- M** Information and Communication Technologies in Second-Foreign Language Teaching. 921 Spring (3 ECTS)
- M** Current Approaches to Bilingualism and Second Language Acquisition 922 Spring (3 ECTS)
- M** Content and Foreign Language Integrated Learning. 907 Spring (3 ECTS)
- M** Bilingual Education: Policy, Programmes and Practice in the Spanish and European Context. 914 Spring (3 ECTS)
- M** Teaching of Languages for Specific Purposes. 915 Spring (3 ECTS)
- M** Research Project Design 913 Spring (6 ECTS)



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For non-native students a B2 level of English is recommended. Unit courses (6 ECTS)

Medicine

U Medical English G132 - Fall

The objectives of this course are: i) to familiarize students with medical language in oral and written English in its academic and dissemination aspects; ii) to provide students with the linguistic skills in spoken and written English that allow them to function effectively in the academic and professional field of medicine; iii) to provide students with instruments and strategies for effective oral communication by presenting lectures in the classroom; iv) to develop reading comprehension strategies related to specialized medical texts; v) to expand students' knowledge in the field of scientific-medical terminology; and vi) to develop students' communicative competence by providing them with improvement guidelines and effective work techniques for oral and written communication in English.

Nursing

U Community Health Care G1634 - Spring

The aim of this course is that students will be able to obtain and analyse data about Community Health in order to set Evidence-Based interventions to promote Health and to minimize Health-related problems in people, families and community. The contents are organized in three parts: PART I. Introduction to research; PART II. Most Prevalent Chronic Diseases; PART III. Communicable Diseases. The course includes practical hours in which activities are intended to delve into any of the contents of the course, and to promote teamwork skills, biostatistics skills, scientific information management, case discussions and public communication, based on previously established criteria. In addition, small group work is performed to obtain skills in searching in databases and critical reading and comprehension of scientific articles.



Master's Degree in Molecular Biology and Biomedicine

Exchange students can take up to 30 ECTS from UC official Master's studies.

The UC Master's Degree in Molecular Biology and Biomedicine is oriented towards cutting-edge research in the fields of Molecular Biology and Genetics, as well as in a variety of molecular aspects of Biomedicine.

The Master offers the following 5 ECTS courses taught in English:

M Workshop of Biomedicine 450 - Fall

This course aims to equip students with the skills necessary to plan, develop, and communicate a research project in the fields of Biomedicine and Molecular Biology. It focuses on developing the ability to critically analyse research projects and provides training in the application of current methods used in biomedical research.

M Genetic Engineering and Biotechnology 435 - Fall

This course aims to provide students with an overview of current topics in Genetic Engineering and Biotechnology.

M Current Advances and Future Trends in Molecular and Cellular Microbiology 431 - Fall

This course aims to provide students with an in-depth understanding of the latest advancements in Molecular and Cellular Microbiology. It focuses on familiarizing students with current technologies and their applications within this research field. Additionally, the course is designed to develop the skills necessary to formulate and investigate research topics in Microbiology, utilizing a comprehensive range of techniques.

M Molecular Bases of Cell Proliferation, Differentiation and Death 440 - Fall

This course aims to provide foundational knowledge on the molecular biology of cell proliferation, differentiation, and death, along with related pathologies, with a special emphasis on cancer.

M Structure of Macromolecules 447 - Fall

This course aims to provide an understanding of the underlying principles that determine macromolecular structure. Additionally, it seeks to equip students with basic knowledge of the techniques used to determine the three-dimensional structures of macromolecules.



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U Prehistory of the Iberian Peninsula I G1830 - Fall

This course aims to frame the Prehistory of the Iberian Peninsula within the broader context of universal Prehistory, understanding the initial settlement of the peninsula as part of the human colonization of Europe. Additionally, it seeks to analyse the historical development of primitive hunter-gatherer communities during the Palaeolithic and Mesolithic periods, examining their transformation over time and exploring the initial processes of change in their modes of production that led to the emergence of early tribal societies.

U Geographic Information Systems II (Vector-Based) G184 - Spring

This course aims to facilitate students the acquisition of theoretical knowledge and technical abilities that allow them to design and develop and GIS project according to a correct methodology.

U Prehistory of the Iberian Peninsula II G213 - Spring

This course aims to provide an understanding of the processes that led to the adoption of agricultural lifestyles by hunter-gatherers in the Iberian Peninsula, alongside knowledge of the general characteristics of early agrarian societies across its various regions. It further seeks to deepen students' comprehension of social complexity, applying this concept to Iberian groups, and to familiarize them with the traits of the earliest societies showing evidence of social stratification in the peninsula.

The course also covers the social changes brought about by colonization in the first millennium BCE, encourages debate on the origins of state organization in Iberia, and promotes a respectful and proactive attitude toward the preservation of archaeological heritage. Additionally, it aims to develop students' critical thinking skills in response to the misinterpretations of Prehistory and to introduce them to archaeological methods used in the study of late prehistoric societies.



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FALL

U Materials

G1901 - Fall

In this course a wide range of different families of materials commonly employed for industrial applications is studied, as well as their physical and mechanical properties. The basic techniques of production, conformation and transformation of industrial materials are analysed, based on their relationship with their structure, properties and mechanical behaviour. Also, laboratory practice sessions will allow the students to apply the knowledge acquired during the lessons. At the end of the semester, the students will be able to select the appropriate material for a certain application, and perform designing calculations based on their main properties.

U Medium and Low Voltage Electrical Installations

G1674 – Fall

The aim is to introduce students into the design, calculation and execution of industrial, commercial or domestic electrical installations. The most relevant aspects of the applicable regulations on this field will be described. The most common wiring diagrams will be studied. Proper dimensioning of electricity conductors will be defined. The most common electrical switchgear is also described with emphasis on the protective devices. The most relevant aspects about electrical safety will be properly treated. Concepts of great importance as compensation of reactive power in electrical systems will also be

addressed. Finally, basic concepts on quality of power will be analysed, given its importance in the current facilities.

U Electrical Drives

G875 – Fall

This subject introduces students to the general theory of design, modelling and control of modern AC and DC electric drives. The course covers all the aspects related with this topic: electrical drive mechanics, electro-mechanical energy conversion and regulating properties of electric motors. From a theoretical point of view both the steady-state and dynamic properties of several combination of topologies are determined for the various operation regimes and control methods. Finally, some commercial-grade electrical drives are analysed considering typical industrial applications.

U Industrial Chemistry

G716 – Fall

The main goal is that the students are able to interpret industrial processes based on chemical reaction, apply separation unit operations to raw material and product purification, and create, analyse and evaluate preliminary chemical process designs to meet desired needs. The expected learning results are: i) to apply and execute basic calculations to solve mass and heat transfer unit operations and ideal reactors; ii) to create and interpret chemical process designs at preliminary level, iii) to apply modern process simulation tools to industrial process subsystems synthesis and analysis.



U Renewable and Alternative Energies G605 – Fall

This course is taught in Torrelavega, 30 min. from Santander.

The main learning outcomes of this subject are: (1) ability to cope with the present situation of the energy system and its possible evolution (2) deeper knowledge of the concept of energy and its applications on renewable sources and (3) to obtain the necessary skills to carry out engineering projects that use renewable energy sources.

U Environmental Technology in Mining G629 – Fall

This course is taught in Torrelavega, 30 min. from Santander.

During this course, the students will be encouraged to know the basics of Environmental Engineering, interpret basic water quality analysis, learn about basic design of water treatment processes by origin and specific objectives, classify wastes according to its properties and characteristics, categorize soils according to its pollution content, design basic treatment systems for wastes and polluted soils, know the environmental management tools and their applicability and also the applicability of the Environmental Impact Assessment and methods to study the Environmental Impact in the mining framework.

SPRING

U Industrial Robotics and Computer Vision G1013 – Spring

At the end of the semester, the student will have acquired a good knowledge of the following issues: The different setups of industrial robots, kinematic and dynamic control of industrial robots, The different components of a computer vision system, 2D computer vision techniques and basic image processing and computer vision techniques applied to industrial environments.

U Energy and Telecommunications G1895 – Spring

This subject provides a theoretical and practical background of modern Electric Power Systems including an introduction to Renewable Energies. The course covers all the basic aspects related with this topic: Fundamentals of single-phase and three-phase circuits including Active, Reactive and Apparent power. Ideal transformer. DC and AC Electrical Machines. Fundamentals of Power Electronics and Electronic Power Supply in telecom applications. Batteries. Distribution of Electrical Energy and Electrical Installations in residential and industrial environments. Safety in Electrical Installations. Introduction to Renewable Energies. Fundamentals of Solar Thermal and Photovoltaic Energy Systems. Fundamentals of Small Wind Energy Systems. Application and design of Solar and Wind Energy Systems. From a practical point of view the students will develop small laboratory practices related with the theoretical concepts in order to provide them "skills labs" in these subjects.



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For non-native students a B2 level of English is recommended. Unit courses (6 ECTS)

U Maritime Technical English

G1055 - Fall

This course aims to equip students with the skills to effectively communicate in English in both academic and professional settings, encompassing receptive and productive abilities in both written and spoken forms. It provides students with a specialized knowledge of nautical English, enabling them to understand manuals and various information sources, as well as to take courses related to their field in English. Additionally, it prepares students to follow and engage in conferences or talks in English on topics relevant to their specialization and to participate in discussions. The course also focuses on developing oral and written comprehension and production skills, as well as interaction with other English speakers in areas related to their field. It aims to foster students' confidence in using English in academic and professional contexts, provide tools for lifelong autonomous learning, and prepare students for the following professional competencies required by the STCW 78/2010 Convention (as amended by Manila): - Use of IMO Standard Marine Communication Phrases for maritime communication. - Use of spoken and written English necessary for reading nautical charts and publications, planning and directing a voyage, and determining the ship's position. - Understanding meteorological information and safety and operational messages for maintaining a safe navigational watch.

U Technical English

G1091 / G1119 - Spring

This course aims to familiarize students with maritime technical terms and enable them to confidently use English in common communicative situations within the maritime profession. It also focuses on developing communicative skills for interacting effectively in an English-speaking context, ensuring that students are equipped to engage smoothly and professionally in their field.

U English as a Communication Tool in the Professional Sphere

G1308 - Spring

This course aims to equip students to effectively use English in a professional setting, encompassing both receptive and productive skills in written and spoken forms. It prepares students to attend or deliver lectures and talks in English on topics within their field of expertise and to participate in related discussions. Additionally, the course develops students' ability to interact with English speakers on professional matters, fostering confidence in their English communication skills for professional contexts. Students will also gain the skills needed to deliver presentations in English with confidence and fluency, acquire tools for lifelong autonomous learning, and facilitate their integration into multicultural work groups.



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For non-native students a B2 level of English is recommended. Unit courses (6 ECTS)

PHYSICS

U Advanced Experimental Techniques

G79 - Fall / G1775 - Spring

A First contact with advanced instrumentation and techniques is carried out through a set of experiments in different Fields of physics: optics and photonic, nuclear and particle physics and material science. These experiments are mostly performed in research labs, under supervision of an expert in each of the topics.

U Advanced Computation G80 - Fall

The course teaches how to use high level modeling tools to represent object oriented computing problems and organize the realization of a solution paying attention to the phases of the development processes available, the estimation of the computational complexity, and the resolution of the binary representation used. It is highly practice oriented and proposes a physics simulation problem to be solved with java. Finally, the students will explore how to manage different volumes of information and automated forms to present resulting data.

U Particle Physics G1777 - Spring

An overview of theoretical and experimental particle Physics will be given. The main experimental techniques, particle detectors and accelerators, will be reviewed. Examples of collider data-analysis and particle detection with solid state detectors will be treated in the lab. Basic concepts of QCD and weak interaction as gauge theories will be given, as well as an overview of the current problems of the Standard Model and the possible theories going beyond.

U Astronomy G1776 - Spring

The course will cover the basics of the current knowledge in Astronomy. A global vision of our understanding of the Universe, the scales involved and the Forces driving its evolution will be given. Topics include the life of the stars or black hole Formation, among others. This will be complemented with the description of the main observational techniques and experimental evidences that lead to the current picture we have of the Universe.



U Experimental Optics G1778 - Spring

The course will teach mainly through experiments on some of the Fundamentals and techniques in optics. Experiments may include geometrical optics, photometry, dispersion, polarization, interference, diffraction, optical coherence and digital image processing. The student will learn how to use a variety of instruments, how to obtain and process the measurements and eventually, how to extract the information contained in the results.

MATHEMATICS

U Advanced Probability G1894 - Fall

The learning outcomes for this subject include the acquired knowledge and management of advanced procedures in Probability Calculation with emphasis on limit theorems and some models of continuous time stochastic processes that include Brownian motion and, with examples of their application.

U Advanced Statistics G1903 - Fall

The students attending this course will acquire skills to perform simple simulations and understand the management of most common techniques of multivariate analysis, including Discriminant Analysis, Cluster Analysis, Principal Components Analysis, Factorial Analysis and Multidimensional Scaling.

U Measure Theory G1902 - Spring

The basic theory of abstract integration will be developed in this course, both for positive measurable functions and with complex values. The basic theorems of convergence will be studied and compared with some related theorems already known by the student. Topics include the most common sigma- algebras and their completion, the relationship between positive linear functions and their representation as integrals, the relationships between measurable and continuous functions, and the general L_p spaces.



COMPUTER SCIENCE

U Computer Animation and Video Games

G1749 - Fall

Fundamentals of design and creation of video games. The animation process step by step. Graphical techniques for game development. Organized in teams, students propose and implement a project demonstrating a novel technology for gaming.

U System and Network Security and Assurance

G1828 - Spring

Computer security is critical in today's technology-driven world. With growing cyber threats, understanding how to protect data and systems is a vital skill. This introductory course in computer security provides the essential knowledge to defend against attacks like malware, phishing, and unauthorized access. You will learn about encryption, firewalls, secure coding practices, and network protection. Whether you are interested in creating secure software or seek to become a better systems administrator, this course equips you with the tools to understand and mitigate risks. You will face security challenges from both perspectives, complement theoretical lessons with a hands-on approach.

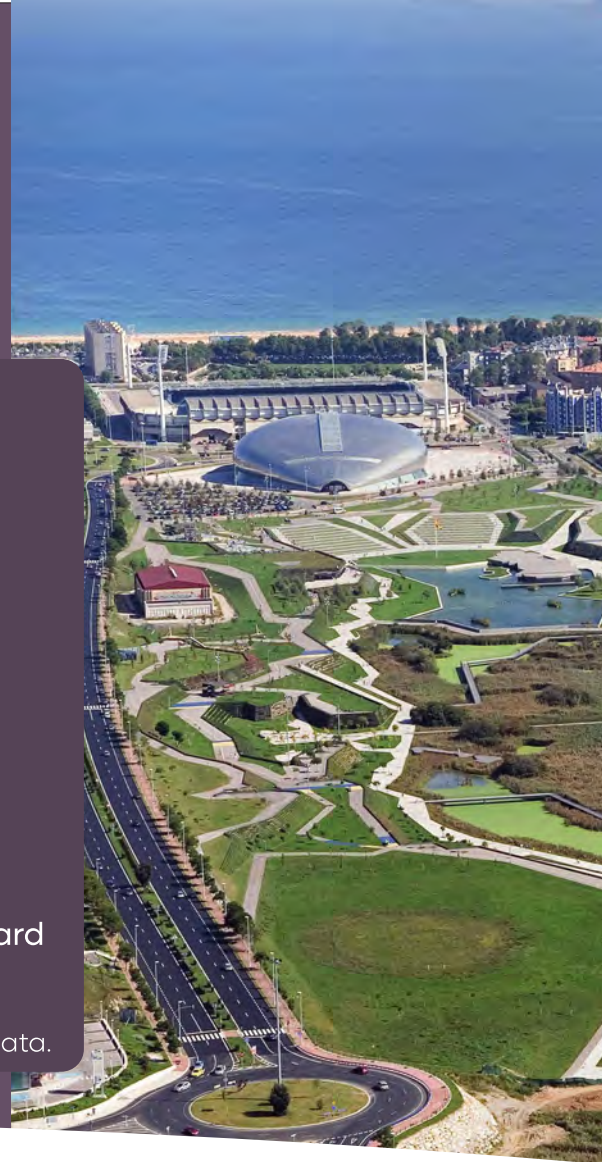
U Natural Language Processing G687 - Spring

This course offers a comprehensive introduction to Natural Language Processing, in which the students will get acquainted with linguistic terminology and learn about algorithms, techniques and methods most commonly used for processing and analysing text data, including tokenization, parsing, sentiment analysis, and language modelling. By the end of the course, students will be able to apply NLP techniques (using the NLTK framework or implementing it in Python) to solve real-world problems in areas like information retrieval, text classification, spelling correction or automated text generation.





Incoming Exchange Students Information sheet



Cost of life

Monthly estimated Budget:

Accommodation + utilities	250 € - 500 €
Maintenance costs	300 €
Transport	30 €
School equipment	40 €
Extra expenses	90 €
Total (monthly average)	710 € - 910 €

Other examples:

1 loaf of bread	0.94 €
1 litre of milk	1.35 €
1.5 litre of mineral water	1.50 €
1 coffee at the university	1.50 €
1 haircut women/men	30 € / 15 €
1 photocopy	0.05 € - 0.1 €
1 city bus ticket	1.30 € / 0.30 € with bus card
1 cinema ticket	8 €
1 book	50 €
1 book (novel)	25 €

Source: 2024 Data.



Vice-rectorate for Internationalisation and Global Engagement

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<http://web.unican.es/en/Studying/academic-offer/courses-taught-in-english>

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How to get around in Santander

The city of Santander is connected by an urban buses network. The price of the ticket is 1.30€. A rechargeable card that reduces the price of the ticket to 0.30€ can be bought at any kiosks and tobacco shop. There are also special night services.

<http://www.tussantander.es/red-de-lineas.php>

<http://www.tussantander.es/nocturno.php>

There is also a lending service of bikes for all students who prefer to use bicycle lanes that are available in different points of the city.
<http://www.tusbic.es>



Santander
city map