

Study in English at UC

Industrial Engineering and Telecommunication

Mines and Energy 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)

Digital Electronic Systems

G730 – Spring

This course will take a practical approach to design digital electronic circuits described in VHDL and implemented in a COLD or FPGA. After theoretical classes on VHDL language and the design sequence, students will solve different low complexity practical circuits that will constitute building blocks for a final more complex circuit. Using the different practical cases students will describe, simulate, synthesize and implement digital circuits of interest for real industry applications. Competences are acquired by developing a guided project. Using the Hardware in the Loop (HIL concept) students develop a digital description of a power converter stage along with the control circuit, first in Simulink and later VHDL. The result is finally implemented verified in digital device.

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.

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.

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.

Further Power Electronics

G1010 – Spring

This course will take a practical approach to design power electronic circuits by completing the training in design of magnetic components and modelling and control techniques for power converters operating in continuous and discontinuous conduction mode. The students are equipped with analysis and design capabilities on modern rectifiers to comply with the standards that limit the line power factor and line harmonic content. They acquire knowledge on the principle of operation analysis and properties of resonant converters. Competences are acquired by developing a guided project consisting in the design of a power converter and the controller for lighting applications.



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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.

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.

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.

Renewable and Alternative Energies

G605 – Fall

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.

Environmental Technology in Mining

G629 – Fall

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.

Courses in other disciplines

A complete list of courses taught in English can be found in the following link:

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

Of special interest are dealing with Spanish Language, History and Culture:

- Spanish History and Culture. G1806 – Spring
- Spanish Language. G1807 – Spring
- European Culture and Civilization. G1808 - Spring
- Cross-Cultural Spanish Arts. G1809 – Spring
- Prehistoric European Art. G1504 – Spring
- Contemporary Spain (1939-2009). Politics, Society and Culture. G1810 – Spring
- Discovering Spanish Landscapes. G1811 – Spring
- Playing with Words: The Spanish Literature in its Main Texts. G1812 - Spring



Vice-rectorate for Internationalisation and Global Engagement

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