FACULTY OF SCIENCE AND TECHNOLOGY
Undergraduate programmes

Physics and Electronic Engineering
Biology
Biochemistry and Molecular Biology
Biotechnology
Physics
Geology
Electronic Engineering
Chemical Engineering
Mathematics
Chemistry

www.ehu.eus
Would you like to live an international experience during your university studies? If so, the University of the Basque Country is an excellent choice.

Our university is the Basque Country’s largest higher education institution. Structured in three campuses -covering the three Basque territories-, our community of students, lecturers and researchers aggregates 60,000 fellows.

Ranked among the top 500 world universities, the University of the Basque Country is a multilingual institution where Spanish, Basque and English are equally spoken. After exhaustive assessment of our activity, we were accredited Campus of International Excellence by the Spanish Ministry of Education. Boosted by this recognition, we aspire to even higher goals: becoming one of Europe’s best.

If you are interested in building on your academic and professional qualifications, the University of the Basque Country can offer you a positive learning environment, optimal technical and human resources and above all the prestige of a university committed to excellence and innovation in teaching. Come and basque yourself.

---

### INTRODUCTION TO THE FACULTY

The Faculty of Science and Technology is located in Leioa (Campus of Biscay). It imparts:

- 1 Double degree
- 9 Bachelor’s Degrees
- 12 Master Degrees
- 6 University diplomas

The Faculty has over 2,500 undergraduate students and over 500 graduate and doctoral students. It has some 775 teaching and research staff in 35 scientific and technical areas of specialisation conducting teaching, research, administration and scientific dissemination activities. Every year it receives some 50 exchange students, and their number constantly increases.

### INFRASTRUCTURES

- 44 lecture rooms with audio-visual equipment
- 12 meeting rooms with movable furnishings and audio-visual equipment
- 9 computer rooms with operating systems and programs for practice
- 73 teaching laboratories equipped for experiments

### FACILITIES FOR INDEPENDENT USE BY THE STUDENT BODY

- Free-access IT lecture room
- Study rooms
- Area for group work

### SPECIAL LABORATORIES

Industrial premises with a useful surface area of 1,040m² for the installation of special equipment.

### OTHER FACILITIES AND SERVICES

Furnished dining room for free student access Mailegua, a reservation service for facilities and computers on loan Lockers.
The University of the Basque Country is structured in 3 campuses: the Campus of Araba, the Campus of Biscay and that of Gipuzkoa.

CAMPUS OF BISCAY

A total 9 Faculties and Schools make up our largest campus. Along with 2 faculties located in downtown Bilbao, we have 7 faculties in our University complex of Leioa (15 km from Bilbao), and an Engineering Section in Portugalete.
Capital of Biscay: Bilbao (343,173 inhabitants)
www.bilbao.net

CONTACT
Faculty of Science and Technology
Barrio Sarriena s/n, 48940 Leioa - Bizkaia

Phone no.: +34 946 015 495
Email: ciencia.internacional@ehu.eus
www.ztf-fct.com

MULTILINGUALISM

Lessons are taught in Spanish and Basque language. However, every year, an increasing number of subjects are taught in English. Currently, a total of 29 subjects are imparted completely in English and another 39 as English friendly courses, where students can take up topics, internships, seminars and examinations in English. In addition, there is also the possibility of conducting the Final Year Project in English in all the Faculty degree programmes. The student can join research groups in the centre and complete his/her studies with internships in English under faculty supervision.

MOBILITY PROGRAMMES

The Faculty has agreements in the following international mobility programmes: Erasmus+, Latin America, and Other Destinations (USA, Canada and South Korea). Incoming students receive individualised attention from the mobility coordinators of each degree programme and the support of the Faculty Student Body Office. We run a Buddy Programme, wherein local students help incoming students to integrate into life at the Faculty.

POSTGRADUATE PROGRAMMES AVAILABLE AT THE FACULTY

You may consult information about postgraduate degrees at the UPV/EHU at:
http://www.ehu.eus/es/web/estudiosdeposgrado-graduondokoikasketak

ENVIRONMENT AND NATURAL RESOURCES (Official Postgraduate Programme)
- Master in Environmental Agrobiology
- Erasmus Mundus Master of Science in Marine Environment and Resources
- Master in Environmental Contamination and Toxicology
- Master in Ecosystem Biodiversity, Operation and Management
- Master in Quaternary: Environmental Changes and the Human Footprint
- Master in Landscape, Heritage, Territorial and City Management

MATHEMATICS (Official Postgraduate Programme)
- Master in Mathematical, Statistical and Computational Modelling and Research

PHYSICS, CHEMISTRY AND MATERIALS (Official Postgraduate Programme)
- Master in Synthetic and Industrial Chemistry
- Master in New Materials
- Master in Quantum Science and Technology

BIOMEDICINE, QUALITY OF LIFE AND HEALTH (Official Postgraduate Programme)
- Master in Molecular Biology and Biomedicine

INDUSTRIAL ENGINEERING AND TECHNOLOGY (Official Postgraduate Programme)
- Master in Chemical Engineering
Field of Knowledge: Engineering

The Double Degree in Physics and Electronic Engineering offers training in engineering with a pronounced science and physics component and a sizable technological component. Among the competencies cultivated are:

- Conception, design and production of electronic equipment and systems using mathematical techniques, in collaboration with professionals.
- Construction of physical models based on experimental data and the proper formulation and resolution of problems.
- Mastery in the use of algebraic and geometric structures and differential and integrated calculus.
- Design, validation and optimisation of electronic devices, circuits and systems, as well as prototypes in diverse areas of application.
## CURRICULUM

### FIRST YEAR 66 credits in core subjects

**Full year**
- Álgebra Lineal y Geometría I (12 ECTS)*
- Cálculo Diferencial e Integral I (12 ECTS)
- General Physics (12 ECTS)

**Fall semester**
- Introducción a la Computación (6 ECTS)
- Química I (6 ECTS)

<table>
<thead>
<tr>
<th>Spring semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundamentos de Programación (6 ECTS)</td>
</tr>
<tr>
<td>Química II (6 ECTS)*</td>
</tr>
<tr>
<td>Técnicas Experimentales I (6 ECTS)</td>
</tr>
</tbody>
</table>

### SECOND YEAR 60 credits in compulsory subjects

**Full year**
- Análisis Vectorial y Complejo (9 ECTS)*
- Mecánica y Ondas (15 ECTS)
- Mathematical Methods (12 ECTS)

**Fall semester**
- Electromagnetismo I (6 ECTS)
- Electrónica (6 ECTS)

<table>
<thead>
<tr>
<th>Spring semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Física Moderna (6 ECTS)</td>
</tr>
<tr>
<td>Técnicas Experimentales II (6 ECTS)</td>
</tr>
</tbody>
</table>

### THIRD YEAR 60 credits in compulsory subjects

**Full year**
- Física Cuántica (12 ECTS)
- Métodos Computacionales (9 ECTS)
- Técnicas Experimentales III (9 ECTS)
- Termodinámica y Física Estadística (12 ECTS)*

**Fall semester**
- Electromagnetismo II (6 ECTS)
- Óptica (6 ECTS) EFC

<table>
<thead>
<tr>
<th>Spring semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instrumentación I (6 ECTS)</td>
</tr>
</tbody>
</table>

### FOURTH YEAR 60 credits in compulsory subjects

**Fall semester**
- Dispositivos Electrónicos y Optoelectrónicos (6 ECTS)
- Electrónica Digital (6 ECTS)
- Física del Estado Sólido I (6 ECTS)
- Señales y Sistemas (6 ECTS)
- Técnicas Actuales de Programación (6 ECTS)

<table>
<thead>
<tr>
<th>Spring semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arquitectura de Computadores (6 ECTS)</td>
</tr>
<tr>
<td>Circuitos Lineales y no Lineales (6 ECTS)</td>
</tr>
<tr>
<td>Control Automático I (6 ECTS)</td>
</tr>
<tr>
<td>Electrónica Analógica (6 ECTS)</td>
</tr>
<tr>
<td>Física Nuclear y de Partículas (6 ECTS)</td>
</tr>
</tbody>
</table>

### FIFTH YEAR 54 credits (13.5 in compulsory subjects + 18 in electives + 10.5 in EE FYP + 12 in Physics FYP)

**Fall semester**
- Empresa y Proyectos (7.5 ECTS)*
- Sensores y Actuadores (6 ECTS)*

<table>
<thead>
<tr>
<th>Electives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Automático II (6 ECTS)</td>
</tr>
<tr>
<td>Diseño de Sistemas Digitales (6 ECTS)*</td>
</tr>
<tr>
<td>Electrodinámica (6 ECTS)</td>
</tr>
<tr>
<td>Instrumentación II (6 ECTS)</td>
</tr>
<tr>
<td>Mecánica Cuántica (6 ECTS)</td>
</tr>
<tr>
<td>Microelectrónica y Microsistemas (6 ECTS) EFC</td>
</tr>
<tr>
<td>Structural Properties of Solids (6 ECTS)</td>
</tr>
<tr>
<td>Sistemas de Alta Frecuencia (6 ECTS)</td>
</tr>
<tr>
<td>Sistemas Operativos y Tiempo Real (6 ECTS)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spring semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astrofísica (6 ECTS)</td>
</tr>
<tr>
<td>Comunicación de Datos y Redes (6 ECTS)</td>
</tr>
<tr>
<td>Electrónica de Comunicaciones (6 ECTS)</td>
</tr>
<tr>
<td>Electrónica de Potencia (6 ECTS)</td>
</tr>
<tr>
<td>Física de los Medios Continuos (6 ECTS)</td>
</tr>
<tr>
<td>Física del Estado Sólido II (6 ECTS)*</td>
</tr>
<tr>
<td>Gravitación y Cosmología (6 ECTS)</td>
</tr>
<tr>
<td>Técnicas Experimentales IV (6 ECTS)</td>
</tr>
<tr>
<td>Temas de Física (6 ECTS)</td>
</tr>
</tbody>
</table>

**FINAL YEAR PROJECT**
- Final Year Project in Physics
- Final Year Project in Electronic Engineering

*English Friendly Courses (EFC) are those degree subjects which, while being taught in Spanish, offer the subject programme, along with tutoring, diverse tasks, examinations, etc., in English.
BACHELOR’S DEGREE IN BIOLOGY

Field of Knowledge: Sciences

The Degree programme course in Biology studies the origin, evolution and properties of living beings on very diverse scales, from the molecule to the biosphere, integrating structural, functional and evolutionary approaches. The following are the main concepts of study:

- The genetic, morphological and functional foundations of biodiversity.
- The development of tools for cataloging animals, plants, fungi, microorganisms and virus.
- Phylogenetic analysis and the management of natural resources.
- Isolating and analysing biomolecules, metabolic activities and the conduct of genetic and molecular diagnostics.
- Obtaining and preserving different types of cells, tissue and organisms, and applying safe laboratory procedures.
## CURRICULUM

### FIRST YEAR  60 credits (54 in core subjects + 6 in compulsory subjects)

**Full year**
- Física (9 ECTS)
- Geología (9 ECTS)

**Fall semester**
- Bioquímica I (6 ECTS)
- Química (6 ECTS)
- Biología Celular (6 ECTS)
- Matemáticas (6 ECTS)

**Spring semester**
- Bioquímica II (6 ECTS)
- Bioestadística (6 ECTS)
- Conceptos y Método en Biología (6 ECTS)

### SECOND YEAR  60 credits (6 in core subjects + 54 in compulsory subjects)

**Full year**
- Botánica (12 ECTS)*
- Zoology (12 ECTS)

**Fall semester**
- Genética (6 ECTS)
- Microbiología (ECTS)
- *Termodinámica y Cinética Química (6 ECTS)*

**Spring semester**
- Genética Molecular (6 ECTS)
- Diversidad Microbiana (6 ECTS)
- Biología Tisular (6 ECTS)

### THIRD YEAR  60 credits (48 in compulsory subjects + 12 in electives)

**Full year**
- Ecología (12 ECTS) EFC

**Fall semester**
- Antropología Física (6 ECTS)
- Foundations of animal physiology (6 ECTS)
- Fundamentos de Fisiología Vegetal (6 ECTS)

**Electives for 3rd and 4th year**
- Diversidad de Plantas Vasculares (4.5 ECTS)*
- Diversidad Fúngica y Algal (6 ECTS)
- Entomología (6 ECTS)
- Evolución Molecular (4.5 ECTS)
- Vertebrates (6 ECTS)
- Ecofisiología Vegetal (6 ECTS)
- Ecología Forestal (4.5 ECTS)*
- Ecología Marina (6 ECTS)*
- Fisiología Animal Ambiental (6 ECTS)*
- Cell & Molecular Biology (6 ECTS)
- Cultivos de Tejidos Vegetales (6 ECTS)
- Fisiología Microbiana (4.5 ECTS)

**Spring semester**
- Derecho y Ética en Biociencias (6 ECTS)
- Fisiología de los Sistemas Animales (6 ECTS)
- Fisiología Vegetal Avanzada (6 ECTS)

**Electives for 3rd and 4th year**
- Evolución Humana (6 ECTS)
- Geobotánica (6 ECTS)
- Zoogeografía (4.5 ECTS)
- Limnología (6 ECTS)*
- Microbiología Ambiental (4.5 ECTS)
- Antropogenética (6 ECTS)
- Histología Comparada (4.5 ECTS)
- Ingeniería Genética y Análisis Genético Molecular (6 ECTS)
- Microbiología Aplicada (6 ECTS)

### FOURTH YEAR  60 credits (48 in electives + 12 in Final Year Project)

**FINAL YEAR PROJECT (12 ECTS)**
- Biodiversity and Evolution (M1)
- Environmental Biology (M2)
- Genetics and Molecular and Cell Biology (M3)

*English Friendly Courses (EFC) are those degree subjects which, while being taught in Spanish, offer the subject programme, along with tutoring, diverse tasks, examinations, etc., in English.*
BACHELOR’S DEGREE IN BIOCHEMISTRY AND MOLECULAR BIOLOGY

Field of Knowledge: Sciences

The degree programme in Biochemistry and Molecular Biology trains students to understand organisms at cellular and molecular levels and learn about the natural world as a product of evolution and the impact of human influence. In this degree programme, students learn to:

• Understand the molecular foundations of inheritance and their implications on scientific progress.
• Acquire an integrated vision of metabolism, cell communication systems and their capacity to adapt to physio-pathological and environmental changes.
• Work properly in a laboratory, correctly interpreting data and experimental results, designing and managing projects, and collaborating and working in multidisciplinary and multicultural teams.
CURRICULUM

FIRST YEAR 60 credits in core subjects

Full year

- Física (9 ECTS)
- Metodología Bioquímica Básica (9 ECTS)

Fall semester

- Bioquímica I (6 ECTS)
- Química (6 ECTS)
- Biología Celular (6 ECTS)
- Matemáticas (6 ECTS)

Spring semester

- Bioquímica II (6 ECTS)
- Bioestadística (6 ECTS)
- Técnicas Histológicas y Cultivos Celulares (6 ECTS)

SECOND YEAR 60 credits (6 in core subjects + 54 in compulsory subjects)

Fall semester

- Genética (6 ECTS)
- Microbiología (6 ECTS)
- Termo
dinámica y Cinética Química (6 ECTS)*
- Biosíntesis de Macromoléculas y su Regulación (6 ECTS)
- Regulación del Metabolismo (6 ECTS)

Spring semester

- Inmunología (6 ECTS)
- Técnicas Instrumentales (6 ECTS)
- Proteómica, Estructura e Ingeniería de Proteínas (6 ECTS)
- Señalización Celular (6 ECTS)
- Tecnología del DNA Recombinante (6 ECTS)

THIRD YEAR 60 credits in compulsory subjects

Fall semester

- Biofísica (6 ECTS)
- Animal Physiology (6 ECTS)*
- Fisiología Vegetal (6 ECTS)
- Genética Humana (6 ECTS)
- Métodos en Biología Molecular (6 ECTS)

Spring semester

- Biocatalización (6 ECTS)
- Bioinformática (6 ECTS)
- Bioquímica Clínica y Patología Molecular (6 ECTS)
- Derecho y Ética en Biociencias (6 ECTS)
- Espectroscopía de Biomoléculas (6 ECTS)

FOURTH YEAR 60 credits (12 in compulsory subjects + 36 in electives + 12 in Final Year Project)

Fall semester

- Métodos Avanzados en Bioquímica (6 ECTS)

Electives

- Ampliación de Biología Molecular (4.5 ECTS)
- Biología de Sistemas (4.5 ECTS)*
- Biología del Desarrollo (4.5 ECTS)
- Fisiología Humana (4.5 ECTS)
- Fisiología Microbiana (4.5 ECTS)
- Fundamentos de Microbiología Industrial (4.5 ECTS)
- Nanobiotechnología (4.5 ECTS)
- Virología (4.5 ECTS)

Spring semester

- Biología Estructural: Aplicaciones Biomédicas (6 ECTS)

Electives

- Molecular Evolution (4.5 ECTS)
- Farmacología Molecular (4.5 ECTS)*
- Genómica (4.5 ECTS)
- Ingeniería Tisular (4.5 ECTS)
- Síntesis Orgánica en Biociencias (4.5 ECTS)*

FINAL YEAR PROJECT (12 ECTS)

* English Friendly Courses (EFC) are those degree subjects which, while being taught in Spanish, offer the subject programme, along with tutoring, diverse tasks, examinations, etc., in English.
The degree programme in Biotechnology imparts knowledge for the design and analysis of bioprocesses used in obtaining products, goods and services, as well as in managing and controlling them. Biotechnology students are trained to:

- Know the scientific foundations necessary to understand the behaviour of biological molecules, their properties and interactions, as well as biochemical and industrial process engineering.
- Understand the experimental strategies used in biotechnological research.
- Comprehend the biochemical foundations of biological diversity from the level of the molecule to that of the organism, understanding the molecular basics of genetic transfer and its applications.

Field of Knowledge: Sciences
## CURRICULUM

### FIRST YEAR  60 credits in core subjects

**Full year**
- Física (9 ECTS)
- Metodología Bioquímica Básica (9 ECTS)

**Fall semester**
- Bioquímica I (6 ECTS)
- Química (6 ECTS)
- Biología Celular (6 ECTS)
- Matemáticas (6 ECTS)

**Spring semester**
- Bioquímica II (6 ECTS)
- Bioestadística (6 ECTS)
- *Basics of Chemical Engineering and Biotechnology (6 ECTS)*

### SECOND YEAR  60 credits in compulsory subjects

**Fall semester**
- Genética (6 ECTS)
- Microbiología (6 ECTS)
- *Thermodynamics and Chemical Cynetics (6 ECTS)*
- Biosíntesis de Macromoléculas y su Regulación (6 ECTS)
- *Fluid Mechanics (6 ECTS)*

**Spring semester**
- Inmunología (6 ECTS)
- Técnicas Instrumentales (6 ECTS)
- Biología Molecular e Ingeniería Genética (6 ECTS)
- Cultivos Celulares y Tisulares (6 ECTS)
- Microorganismos y Producción Industrial (6 ECTS)

### THIRD YEAR  60 credits in compulsory subjects

**Fall semester**
- *Chemical Reactor design (6 ECTS)*
- *Animal Physiology (6 ECTS)*
- Metabolismo y Fisiología Vegetal (6 ECTS)
- Métodos en Ingeniería Genética (6 ECTS)
- *Mass Transfer (6 ECTS)*

**Spring semester**
- Biocatálisis (6 ECTS)
- Derecho y Ética en Biociencias (6 ECTS)
- Laboratorio Integrado en Biotecnología (6 ECTS)
- *Modelización Matemática (6 ECTS)*
- *Processes of Separation (6 ECTS)*

### FOURTH YEAR  60 credits (12 in compulsory subjects + 36 in electives +12 in Final Year Project)

**Fall semester**
- Economía General y Organización de Empresas (6 ECTS)

**Spring semester**
- Procesos y Productos Biotecnológicos (6 ECTS)

**Electives**
- Ampliación de Biología Molecular (4.5 ECTS)
- Análisis de Riesgos y Seguridad en Plantas Industriales (4.5 ECTS)
- *Systems Biology (4.5 ECTS)*
- *Environmental Biotechnology (4.5 ECTS)*
- Fisiología Microbiana (4.5 ECTS)
- Gestión de Calidad (4.5 ECTS)
- Nanobiotecnología (4.5 ECTS)
- Virología (4.5 ECTS)
- Biotecnología Microbiana (4.5 ECTS)
- Biotecnología Vegetal (4.5 ECTS)
- Genómica (4.5 ECTS)
- Ingeniería Tisular (4.5 ECTS)
- *Síntesis Orgánica en Biociencias (4.5 ECTS)*

**FINAL YEAR PROJECT (12 ECTS)**

*English Friendly Courses (EFC) are those degree subjects which, while being taught in Spanish, offer the subject programme, along with tutoring, diverse tasks, examinations, etc., in English.*
The degree programme in Physics teaches students how to build physical models based on experimental data, properly formulating and resolving problems. It provides training and know-how to develop other disciplines, to which it contributes new instrumentation and techniques: computerised tomography, magnetic resonance, positron emission tomography, echography or laser surgery, among others. In addition, Physics students acquire competencies to:

- Theoretically understand physical phenomena, explaining scientific ideas, problems and results orally and in writing.
- Manage group work and organise, plan and learn independently.
- Acquire skills in the field of experimentation.
CURRICULUM

FIRST YEAR 60 credits in core subjects
Full year
• Álgebra Lineal y Geometría I (12 ECTS)*
• Cálculo Diferencial e Integral I (12 ECTS)
• General Physics (12 ECTS)
Fall semester
• Introducción a la Computación (6 ECTS)
• Química I (6 ECTS)

SECOND YEAR 60 credits in compulsory subjects
Full year
• Análisis Vectorial y Complejo (9 ECTS)
• Mecánica y Ondas (15 ECTS)
• Numerical Methods (12 ECTS)
Fall semester
• Electromagnetismo I (6 ECTS)
• Electrónica (6 ECTS)

THIRD YEAR 60 credits (54 in compulsory subjects + 6 in electives)
Full year
• Física Cuántica (12 ECTS)
• Métodos Computacionales (9 ECTS)
• Técnicas Experimentales III (9 ECTS)
• Termodinámica y Física Estadística (12 ECTS)*
Fall semester
• Electromagnetismo II (6 ECTS)
• Óptica (6 ECTS)*

Electives 3rd and 4th year
• Sensores y Actuadores (6 ECTS)*
• Señales y Sistemas (6 ECTS)

FOURTH YEAR 60 credits (12 in compulsory subjects + 36 in electives +12 in Final Year Project)
Fall semester
• Física del Estado Sólido I (6 ECTS)

Electives
• Mecánica Cuántica (6 ECTS)
• Structural properties of Solids (6 ECTS)
• Electrodinámica (6 ECTS)

Spring semester
• Física Nuclear y de Partículas

Electives
• Física del Estado Sólido II (6 ECTS)*
• Técnicas Experimentales IV (6 ECTS)
• Temas de Física (6 ECTS)
• Control Automático I (6 ECTS)
• Electrónica Analógica (6 ECTS)

FINAL YEAR PROJECT (12 ECTS)

* English Friendly Courses (EFC) are those degree subjects which, while being taught in Spanish, offer the subject programme, along with tutoring, diverse tasks, examinations, etc., in English.
Field of Knowledge: Sciences

The degree programme in Geology trains students in gathering and interpreting information from the terrestrial surface and subsoil to determine the past and present of the planet as well as to predict its future. In addition, it provides the know-how necessary to:

- Prepare geological maps, which are essential to territorial planning and to proposing strategies for sustainable development.
- Apply geological know-how to explore, extract and manage natural resources.
- Acquire a spatial and temporal overview of geological processes and their effects on the planet.
- Analyse and interpret field and laboratory data and observations using the proper techniques and instruments.
- Convey geological information in writing as well as orally.
- Understand current environmental processes and the possible associated risks.
CURRICULUM

FIRST YEAR  60 credits in core subjects

**Full year**
- Física (9 ECTS)
- Geología (9 ECTS)

**Fall semester**
- Biología (6 ECTS)
- Introducción a la Computación (6 ECTS)
- Matemáticas I (6 ECTS)
- Química I (6 ECTS)

**Spring semester**
- Complementos de Geología (6 ECTS)
- Matemáticas II y Estadística (6 ECTS)
- Química II (6 ECTS)

SECOND YEAR  60 credits in compulsory subjects

**Fall semester**
- Cristalografía (6 ECTS)
- Geología Estructural (6 ECTS)
- Geomorfología (6 ECTS)
- Paleontología (6 ECTS)
- Sedimentología (6 ECTS)

**Spring semester**
- Cartografía Geológica (9 ECTS)
- Estratigrafía (6 ECTS)
- Mineralogía (9 ECTS)*
- Tectónica (6 ECTS)

THIRD YEAR  60 credits in compulsory subjects

**Full year**
- Campamento Multidisciplinar (6 ECTS)

**Fall semester**
- Bioestratigrafía y Paleontología (6 ECTS)
- Geoquímica (6 ECTS)
- Geotecnia (6 ECTS)
- Petrología Ignea (6 ECTS)
- Petrología Sedimentaria (6 ECTS)

**Spring semester**
- Hidrogeología (9 ECTS)
- Petrología Metamórfica (6 ECTS)
- Yacimientos Minerales y Rocas Industriales (9 ECTS)*

FOURTH YEAR  60 credits (18 in compulsory subjects + 30 in electives +12 in Final Year Project)

**Fall semester**
- Electives
  - Cartografías Temáticas y Teledetección (6 ECTS)
  - Geología de Minas (6 ECTS)
  - Ingeniería Geológica (6 ECTS)
  - Recursos Energéticos (6 ECTS)
  - Prácticas en Empresa (6 ECTS)
  - Geología Isotópica (6 ECTS)
  - Medios Sedimentarios (6 ECTS)
  - Micropaleontología (6 ECTS)
  - Mineralogía Analítica (6 ECTS)
  - Tectónica Comparada (6 ECTS)

**Spring semester**
- Análisis de Cuencas y Geología Histórica (6 ECTS)
- Geofísica (6 ECTS)
- Geología Ambiental y Riesgos Geológicos (6 ECTS)

FINAL YEAR PROJECT (12 ECTS)

*English Friendly Courses (EFC) are those degree subjects which, while being taught in Spanish, offer the subject programme, along with tutoring, diverse tasks, examinations, etc., in English.*
The degree programme in Electronic Engineering is marked by pronounced interaction between science and technology. Its essential aim is a solid training in the analysis and design of electronic devices, circuits and systems in all their applications, as well as in those aspects related to research, development and innovation. Electronic Engineering students are trained to:

- Resolve problems by identifying their most relevant physical principles.
- Master the use of algebraic and geometric structures and differential and integrated calculus.
- Design, validate and optimise electronic devices, circuits and systems as well as prototypes for diverse areas of application.
- Handle computational tools and methods proper to electronic engineering, conduct experiments and build prototypes.
CURRICULUM

FIRST YEAR  60 credits in core subjects

Full year
- Álgebra Lineal y Geometría I (12 ECTS)*
- Cálculo Diferencial e Integral I (12 ECTS)
- General Physics (12 ECTS)

Spring semester
- Fundamentos de Programación (6 ECTS)
- Técnicas Experimentales I (6 ECTS)

Fall semester
- Introducción a la Computación (6 ECTS)
- Química I (6 ECTS)

SECOND YEAR  60 credits in compulsory subjects

Full year
- Análisis Vectorial y Complejo (9 ECTS)
- Mecánica y Ondas (15 ECTS)
- Numerical Methods (12 ECTS)

Spring semester
- Arquitectura de Computadores (6 ECTS)
- Circuito Lineales y no Lineales (6 ECTS)
- Control Automático I (6 ECTS)
- Electrónica Analógica (6 ECTS)
- Instrumentación I (6 ECTS)

Fall semester
- Electromagnetismo I (6 ECTS)
- Electrónica I (6 ECTS)

THIRD YEAR  60 credits in compulsory subjects

Fall semester
- Dispositivos Electrónicos y Optoelectrónicos (6 ECTS)
- Electromagnetismo II (6 ECTS)
- Electrónica Digital (6 ECTS)
- Señales y Sistemas (6 ECTS)
- Técnicas Actuales de Programación (6 ECTS)

Spring semester
- Arquitectura de Computadores (6 ECTS)
- Circuito Lineales y no Lineales (6 ECTS)
- Control Automático I (6 ECTS)
- Electrónica Analógica (6 ECTS)
- Instrumentación I (6 ECTS)

FOURTH YEAR  60 credits (7.5 in compulsory subjects + 42 in electives +10.5 in Final Year Project)

Full year
- Física Cuántica (12 ECTS)
- Termodinámica y Física Estadística (12 ECTS)

Fall semester
- Empresa y Proyectos (7.5 ECTS)*

Spring semester
- Optativas
  - Electrónica de Potencia (6 ECTS)
  - Electrónica de Comunicaciones (6 ECTS)
  - Arquitectura de Computadores (6 ECTS)

Electives
- Óptica (6 ECTS)*
- Control Automático II (6 ECTS)
- Instrumentación II (6 ECTS)
- Sensores y Actuadores (6 ECTS)*
- Sistemas Operativos y Tiempo Real (6 ECTS)
- Diseño de Sistemas Digitales (6 ECTS)*
- Microelectrónica y Microsistemas (6 ECTS)*
- Sistemas de Alta Frecuencia (6 ECTS)

FINAL YEAR PROJECT (10.5 ECTS)

* English Friendly Courses (EFC) are those degree subjects which, while being taught in Spanish, offer the subject programme, along with tutoring, diverse tasks, examinations, etc., in English.
The degree programme in Chemical Engineering trains students how to approach the study of industrial processes chemical, biotechnological, environmental, energetic, food, etc. as well as the design, construction, start-up and operation of chemical equipment, processes and plants. The capabilities acquired in this degree course enable students to:

- Plan, draw up and develop projects in the different sectors of chemical engineering, determining their economic, social and environmental feasibility.
- Know the basic aspects of circuit theory, electrical and electronic machinery and the theoretical principles of machines and mechanisms.
- Improve chemical processes based on the innovative tendencies in industry and engineering.
- Draw up technical reports and studies, making experimental measurements and calculations.

Field of Knowledge: Engineering
CURRICULUM

FIRST YEAR  60 credits in core subjects

Full year
- Física (12 ECTS)

Fall semester
- Introducción a la Computación (6 ECTS)
- Matemáticas I (6 ECTS)
- Operaciones Básicas del Laboratorio (6 ECTS)
- Química General I (6 ECTS)

Spring semester
- Diseño Mecánico de Equipos (6 ECTS)
- Ingeniería Ambiental (6 ECTS)

Electives
- Análisis de Riesgos y Seguridad en Plantas Industriales (4.5 ECTS)
- Análisis Económico de Procesos Químicos (4.5 ECTS)
- Environmental Biotechnology (4.5 ECTS)
- Gestión de Calidad (4.5 ECTS)
- Ingeniería de Procesos Biotecnológicos (4.5 ECTS)
- Ingeniería Energética (4.5 ECTS)
- Ingeniería Química y Sostenibilidad (4.5 ECTS)
- Petróleo y Petroquímica (4.5 ECTS)

SECOND YEAR  60 credits (27 in core subjects + 33 in compulsory subjects)

Full year
- Cálculo Numérico en Ingeniería Química (9 ECTS)*
- Experimentación en Ingeniería Química I (9 ECTS)
- Ingeniería de Procesos y Producto (9 ECTS)*
- Introducción a la Computación (6 ECTS)
- Matemáticas I (6 ECTS)
- Operaciones Básicas del Laboratorio (6 ECTS)
- Química General I (6 ECTS)

Spring semester
- Biología (6 ECTS)
- Basics of Chemical Engineering and Biotechnology (6 ECTS)
- Matemáticas II (6 ECTS)
- Química General II (6 ECTS)*

Fall semester
- Economía General y Organización de Empresas (6 ECTS)
- Estadística Aplicada (6 ECTS)
- Fluid Mechanics (6 ECTS)
- Termodinámica Aplicada (6 ECTS)

THIRD YEAR  60 credits in compulsory subjects

Full year
- Experimentación en Ingeniería Química II (9 ECTS)
- Ingeniería de Procesos y Producto (9 ECTS)*

Spring semester
- Cinética de los Procesos Químicos (6 ECTS)
- Expresión Gráfica y Diseño Asistido por Ordenador (6 ECTS)
- Transmisión de Calor (6 ECTS)

Fall semester
- Chemical reactor design (6 ECTS)
- Principios de Ingeniería Eléctrica y Electrónica (6 ECTS)
- Resistencia de Materiales (6 ECTS)
- Mass transfer (6 ECTS)
- Processes of separation (6 ECTS)

FOURTH YEAR  60 credits (31.5 in compulsory subjects + 18 in electives +10.5 in Final Year Project)

Fall semester
- Diseño Mecánico de Equipos (6 ECTS)
- Ingeniería Ambiental (6 ECTS)

Spring semester
- Organización y Gestión de Proyectos (7.5 ECTS)

FINAL YEAR PROJECT (10.5 ECTS)

* English Friendly Courses (EFC) are those degree subjects which, while being taught in Spanish, offer the subject programme, along with tutoring, diverse tasks, examinations, etc., in English.
BACHELOR’S DEGREE IN MATHEMATICS

Field of Knowledge: Sciences

The degree programme in Mathematics trains students in modelling reality as well as formulating, analysing and resolving problems in different business and professional areas based on logical reasoning, while focusing on the practical applications of this degree. Among other skills, work is done on:

• Knowing the purpose, methods and uses of mathematics, its basic concepts, its fundamental results and the demonstrations of some classical theorems.
• Abstracting structural properties, distinguishing these from occasional properties.
• Resolving mathematics problems through basic calculation abilities.
• Using computer applications and developing programs for experimenting with mathematical problems.
• Understanding and using mathematics as a language.
CURRICULUM

FIRST YEAR  60 credits in core subjects

Full year
- Álgebra Lineal y Geometría I (12 ECTS)*
- Cálculo Diferencial e Integral I (12 ECTS)
- General Physics (12 ECTS)

Spring semester
- Estadística Descriptiva (6 ECTS)
- Fundamentos de Programación (6 ECTS)

Fall semester
- Introducción a la Computación (6 ECTS)
- Matemáticas Básicas (6 ECTS)

SECOND YEAR  60 credits in compulsory subjects

Full year
- Cálculo Diferencial e Integral I (15 ECTS)*

Spring semester
- Análisis Complejo (6 ECTS)
- Cálculo de Probabilidades (6 ECTS)
- Curvas y Superficies (9 ECTS)

Fall semester
- Álgebra Lineal y Geometría II (ECTS)*
- Estructuras Algebraicas (6 ECTS)
- Discreet Mathematics (6 ECTS)
- Numerical Methods I (6 ECTS)

THIRD YEAR  60 credits in compulsory subjects

Full year
- Ecuaciones Diferenciales (12 ECTS)

Spring semester
- Algebraic Equations (6 ECTS)
- Global Geometry of curves and surfaces (6 ECTS)
- Métodos Numéricos II (6 ECTS)*
- Modelización Matemática (6 ECTS)

Fall semester
- Álgebra Conmutativa (6 ECTS)
- Inferencia Estadística (6 ECTS)
- Measure and integration (6 ECTS)
- Topología (6 ECTS)*

FOURTH YEAR  60 credits (48 in electives + 12 in Final Year Project)

Fall semester
- Electives
  - Ampliación de Métodos Numéricos (6 ECTS)*
  - Análisis Multivariante (6 ECTS)
  - Programación Matemática (6 ECTS)
  - Códigos y Criptografía (6 ECTS)*
  - Ecuaciones en Derivadas Parciales (6 ECTS)
  - Análisis Funcional (6 ECTS)
  - Grupos y Representaciones (6 ECTS)

Spring semester
- Electives
  - Diseño de Algoritmos (6 ECTS)*
  - Probabilidad y Procesos Estocásticos (6 ECTS)
  - Resolución Numérica de Ecuaciones Diferenciales (6 ECTS)
  - Ampliación de Topología (6 ECTS)
  - Algebraic Geometry (6 ECTS)
  - Teoría de Números (6 ECTS)*
  - Variedades Diferenciables (6 ECTS)

FINAL YEAR PROJECT (12 ECTS)

* English Friendly Courses (EFC) are those degree subjects which, while being taught in Spanish, offer the subject programme, along with tutoring, diverse tasks, examinations, etc., in English.
The degree programme in Chemistry trains students to undertake industrial projects and facilitates their entry into the research world, among other possibilities, accessing the health specialisations of clinical analysis. In addition, chemistry students are capable of:

- Understanding the theoretical and practical aspects of chemistry.
- Safely manipulating chemicals, recognising and assessing the risks entailed by the use of chemical substances and laboratory procedures.
- Analysing and interpreting experimental results and scientific data in order to make decisions.
- Planning, developing, managing and controlling chemical processes and projects and developing capabilities for initiation in research and for working in new environments.
CURRICULUM

FIRST YEAR  60 credits in core subjects

Full year
•  Física (12 ECTS)*

Fall semester
•  Geología (6 ECTS)
•  Matemáticas I (6 ECTS)
•  Operaciones Básicas del Laboratorio (6 ECTS)
•  Química General I (6 ECTS)

Spring semester
•  Biología (6 ECTS)
•  Matemáticas II y Estadística (6 ECTS)
•  Metodología Experimental en Química (6 ECTS)
•  Química General II (6 ECTS)*

SECOND YEAR  60 credits in compulsory subjects

Full year
•  Bioquímica (6 ECTS)
•  Experimentación en Química Física (6 ECTS)
•  Experimentación en Química Inorgánica (6 ECTS)
•  Experiments in Organic Chemistry (6 ECTS)
•  Química Analítica I (9 ECTS)
•  Química Física I (9 ECTS)
•  Química Inorgánica I (9 ECTS)
•  Química Orgánica I (9 ECTS)*

Fall semester
•  Documentación y Comunicación en Química (6 ECTS)
•  Química del Medio Ambiente (6 ECTS)*

Spring semester
•  Calidad y Gestión de Laboratorio (6 ECTS)
•  Productos Orgánicos de Interés Farmacéutico (6 ECTS)*

THIRD YEAR  60 credits (48 in compulsory subjects + 12 in electives)

Full year
•  Experiments in analytic Chemistry (6 ECTS)
•  Ingeniería Química (6 ECTS)
•  Química Analítica II (9 ECTS)
•  Química Física II (9 ECTS)
•  Química Inorgánica II (9 ECTS)
•  Química Orgánica II (9 ECTS)*

Spring semester
Electives
•  Calidad y Gestión de Laboratorio (6 ECTS)
•  Productos Orgánicos de Interés Farmacéutico (6 ECTS)*

Fall semester
Electives
•  Documentación y Comunicación en Química (6 ECTS)
•  Química del Medio Ambiente (6 ECTS)*

FOURTH YEAR  60 credits (12 in compulsory subjects + 30 in electives +18 in Final Year Project)

Fall semester
•  Ciencia de Materiales (6 ECTS)
•  Proyectos en Química Industrial (6 ECTS)

Electives
•  Determinación de Estructuras Orgánicas (6 ECTS)*
•  Interfases y Coloides (6 ECTS)
•  Química Analítica Forense y Medioambiental (6 ECTS)
•  Química Organometálica (6 ECTS)*

Spring semester
Electives
•  Contaminantes Químicos y Radioactividad (6 ECTS)
•  Química Analítica Industrial (6 ECTS)
•  Química de Polímeros (6 ECTS)*
•  Síntesis Orgánica (6 ECTS)

FINAL YEAR PROJECT (18 ECTS)

* English Friendly Courses (EFC) are those degree subjects which, while being taught in Spanish, offer the subject programme, along with tutoring, diverse tasks, examinations, etc., in English.