

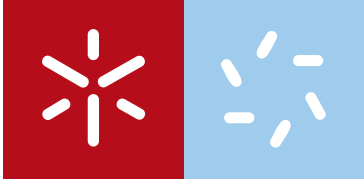
**Universidade do Minho**  
Escola de Ciências



# **BACHELORS AND MASTER DEGREES**

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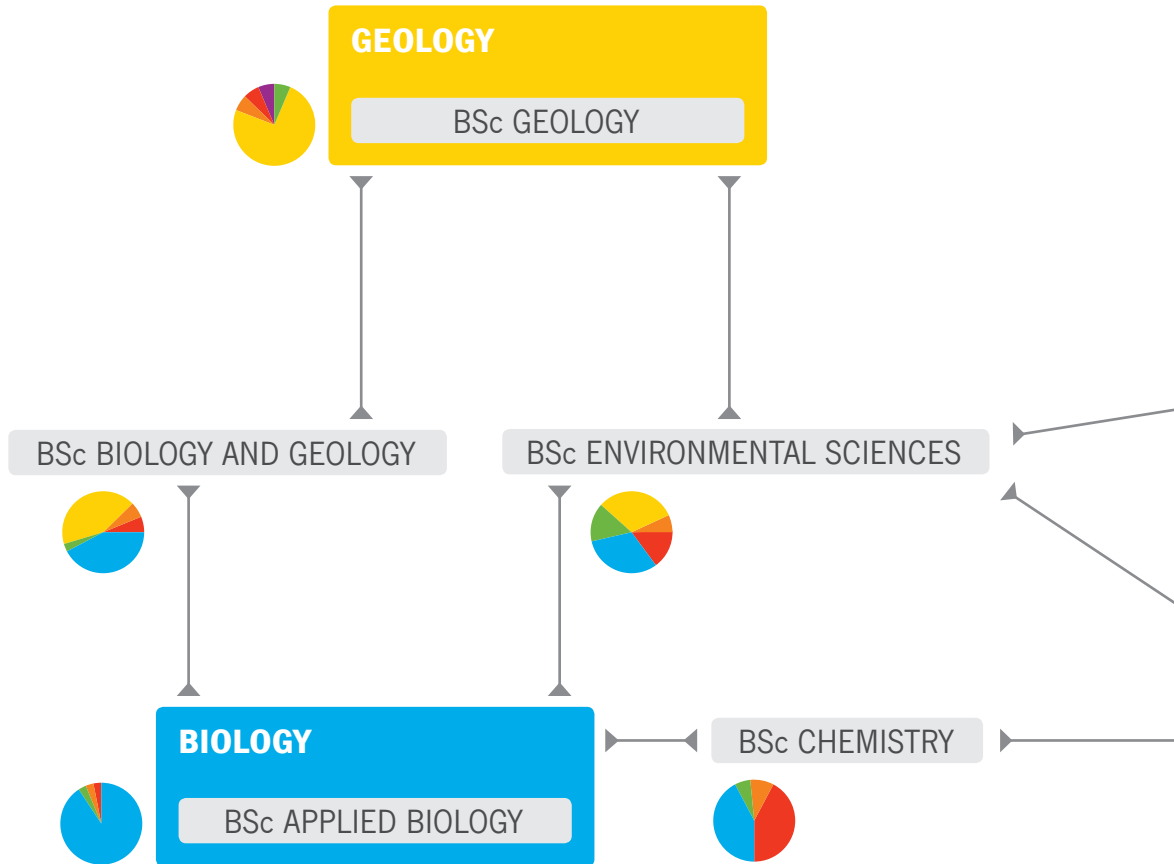
**Universidade do Minho**

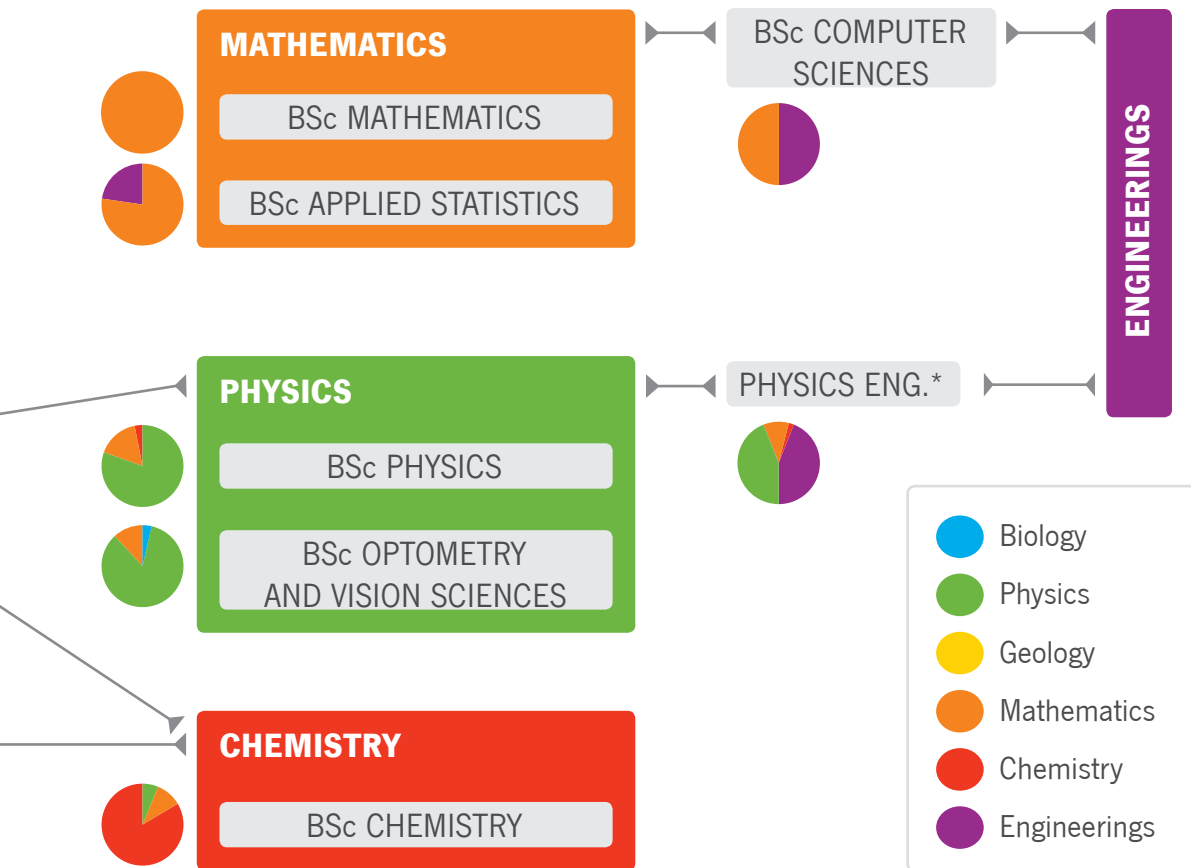
Escola de Ciências

## DEPARTMENTS

 **BIOLOGY**  
**PHYSICS**  
**EARTH SCIENCES**  
**MATHEMATICS**  
**CHEMISTRY**

# BACHELORS SCIENTIFIC AREAS





\* 5 years

# BIOLOGY

**Department  
of Biology**  
[+351] 253 604 310  
sec@bio.uminho.pt  
[www.bio.uminho.pt](http://www.bio.uminho.pt)





## APPLIED BIOLOGY

The main goal is to prepare professionals with a solid knowledge in the life sciences, using interactive teaching/learning methods with a strong component on experimental techniques and practices. Graduates will be qualified in multiple areas of biology and gain knowledge ranging from the molecular and cell biology, organisms, populations and communities.



## BIOLOGY AND GEOLOGY

Provides scientific training in the fields of biology and geology, broadening the access of graduates to the labour market and enabling them to collaborate in various professional sectors, such as environment, nature management and conservation, scientific tourism, geoparks, natural resources exploration and management. The course also enables students to access a master degree in teaching, which qualifies them for teaching in secondary schools.

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## BIOCHEMISTRY

Prepares professionals with a solid background in the fundamental areas of this science. These include the structure and function of biomolecules, the analysis of molecular structures, the organization and physiology of the cell and molecular biology and genetics.



## ENVIRONMENTAL SCIENCES

Trains professionals with the skills to interpret the natural phenomena that control the state of the environment. These graduates benefit from a specialised and integrated training, allowing them to contribute to technical and/or political decision-making based on extensive scientific criteria. They are also prepared to intervene in terms of spatial planning, nature conservation, environmental monitoring and risk control, in different professional fields.





master degrees [2 years]

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## ECOLOGY

Provides a high-level of scientific education, enabling students to improve their knowledge, skills and other attributes in ecology, necessary to handle complex problems related to applied biology, environmental sciences, conservation and management of natural biological resources. Students can pursue doctoral studies or embrace professional carriers in universities, research institutions, environmental and planning offices, public administration, non-governmental organizations, industrial companies and services.



## **PLANT MOLECULAR BIOLOGY, BIOTECHNOLOGY AND BIOENTREPRENEURSHIP**

Aims at postgraduate qualification of human resources in the fields of biochemistry, molecular and functional biology, and biotechnology, complemented with skills in the areas of entrepreneurship, in order to enable them to carry out projects of research and development with strong component of innovation, enhancing their connection to the business sector.



## **APPLIED BIOCHEMISTRY**

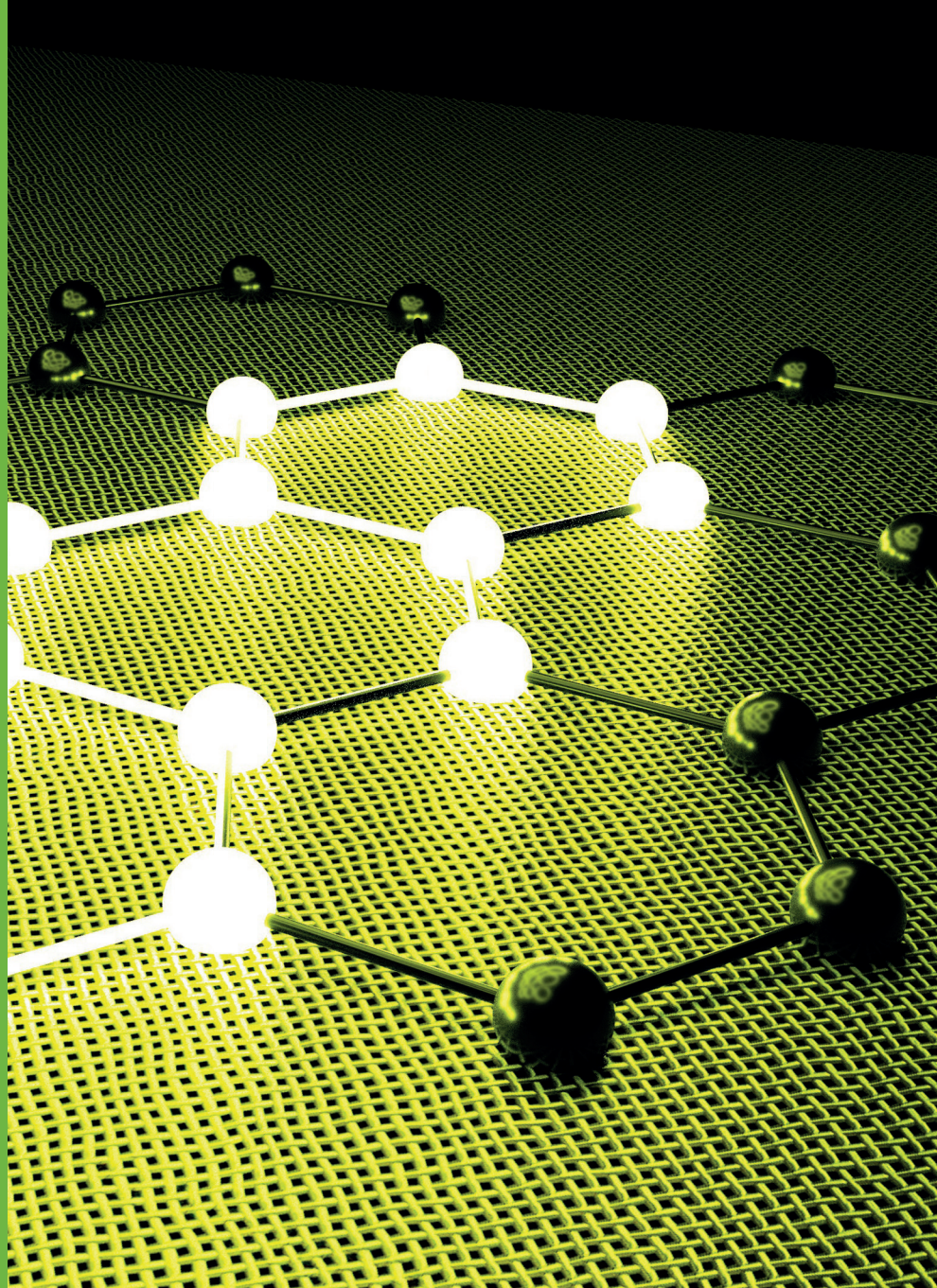
Aims to form professionals with advanced knowledge in the core areas of biochemistry, such as the structure and function of biomolecules and the methods used in their production, characterization and analysis, and its applications. Biochemistry is an independent science with a vast range of applications, from the health sciences to industry, including analytical methods.

## **MOLECULAR GENETICS**

Is designed to provide students with high-level knowledge and training in the fields of molecular genetics, molecular biochemistry and biology and cellular biology. The courses focus mainly on the molecular understanding of cellular function and complex biological processes, and on the use of modern research tools and techniques to unravel these molecular mechanisms.

# PHYSICS

**Department of Physics**  
[+351] 253 604 320  
sec@fisica.uminho.pt  
[www.fisica.uminho.pt](http://www.fisica.uminho.pt)



**1st cycle**

**Integrated  
Master's**

bachelors [3 years]



## PHYSICS

Trains graduates with a solid and comprehensive knowledge that encompasses both mechanics, electromagnetism, optics, thermodynamics and statistical physics such as quantum physics, condensed matter physics, atomic physics and physics of the nucleus and of elementary particles. The degree also has a strong component in experimental physics. Graduates in Physics are able to perform scientific tasks in laboratories and research centres and technical functions and consulting in the industry, hospitals and financial companies.



## OPTOMETRY AND VISION SCIENCES

The goal is to prepare qualified Optometrists, either for independent professional activity or to integrate multidisciplinary teams in the area of vision care and other related areas, namely research in optometry and vision sciences, or in companies that produce or sell optical materials and equipment.

integrated master degree [5 years]



## PHYSICS ENGINEERING

Is an interdisciplinary course that combines the study of physics, mathematics, electronics and informatics, and is designed for new technologies and opportunities of the XXI century, providing the students with qualifications in emerging technological areas.

master degrees [2 years]

## **BIOPHYSICS AND BIONANOSYSTEMS**

Aims at providing students with a profound knowledge in physics of biological systems focusing on their molecular constituents. The students acquire skills to develop new bionanosystems for specific applications in nanomedicine and bionanomaterials, to implement advanced characterization techniques in bionanosystems, to integrate multidisciplinary research and development teams in the area of biophysics and bionanosystems, and to embrace entrepreneurship projects in bionanosystems.



## **PHYSICS**

The goal is to provide a background complementary to that of an undergraduate first degree in physics, physics engineering or similar. It aims to graduate people and enable them to perform fundamental or applied research, college teaching or activities in the industry or services.

## **ADVANCED OPTOMETRY**

Expands the traditional career options of optometrists providing the basis for their integration in research teams or multidisciplinary clinics. The master's program provides the student with theoretical classes based on scientific evidence from scientific databases, simultaneously with practical classes where the student has access to the most advanced technology in ophthalmic imaging and ocular examination.

# EARTH SCIENCES

**Department  
of Earth Sciences**  
[+351] 253 604 300  
sec@dct.uminho.pt  
[www.dct.uminho.pt](http://www.dct.uminho.pt)





## **GEOLOGY**

Aims at the training of technicians, with a geological background, prepared to support and promote the sustainable management of geological resources, integrated with good practices of territorial planning and promotion of environmental quality.



## **BIOLOGY AND GEOLOGY**

Provides scientific training in the fields of Biology and Geology, broadening the access of graduates to the labour market and enabling them to collaborate in various professional sectors, such as environment, nature management and conservation, scientific tourism, geoparks, natural resources exploration and management. The course also enables students to access a master degree in teaching, which qualifies them for teaching in secondary schools.



## **ENVIRONMENTAL SCIENCES**

Trains professionals with the skills to interpret the natural phenomena that control the state of the environment. These graduates benefit from a specialised and integrated training, allowing them to contribute to technical and/or political decision-making based on extensive scientific criteria. They are also prepared to intervene in terms of spatial planning, nature conservation, environmental monitoring and risk control, in different professional fields.



2nd cycle

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master degrees [2 years]

## ENVIRONMENT SCIENCES AND TECHNOLOGIES

The curriculum is organized into two branches of specialization, identified with two major areas of intervention in the environment: “energy” and “environmental monitoring and remediation”. The multidisciplinary advanced training will enable students to integrate the labour market in various fields, such as consultancy and environmental services, production activities and energy sector.



## GEOSCIENCES

Aims at providing advanced training in emerging geoscience domains and creating professionals with a solid knowledge on geological materials and processes and which can act in several areas of the geosciences. The course offers three branches of specialization: external dynamics and global change; geological heritage and geoconservation; valuation of geological Resources.

# MATHEMATICS

**Department  
of Mathematics**  
[+351] 253 604 340  
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[www.math.uminho.pt](http://www.math.uminho.pt)





## MATHEMATICS

It is a wide range programme, providing basic knowledge in the major areas of mathematics, from theory to applications. Strong emphasis will be put on the use of symbolic, numerical, graphical and statistical computational software. This programme aims to provide students with the mathematical skills and techniques needed in a variety of careers in business and commerce as well as in research, industry and education.



## APPLIED STATISTICS

Trains professionals who master various techniques of statistics, with communication and group work skills, allowing their integration in multidisciplinary teams to support the decision-making in large organizations. These may be hospitals and pharmaceutical companies, consultants, banks and insurance companies, media, government entities and municipalities, universities, industry. The degree has a strong component of modelling and solving problems in areas as diverse as medicine, biology, physics, engineering, economics and finance.



## COMPUTER SCIENCES

This degree characterizes by a strict vision of computing, with a solid mathematical foundation. The degree structure aims to provide students a broad set of computer science competences, including specific knowledge and capacities blended with intellectual, experimental and soft skills. This training prepares graduates with a critical and responsible attitude towards solving the information technology challenges, and to the development of robust software applications and its integration in technological platforms.



2nd cycle

22

master degrees [2 years]

## STATISTICS

Statistics is crucial for the development of the society as regards a large variety of problems, such as the struggle against epidemic diseases, the implementation of new treatment drugs, the study of environmental risk, quality control in industry, studies in social sciences, the development of economic models and the dissemination of information in social communication. The application of statistics in each one of these areas requires a rigorous training and this course intends to prepare professionals to integrate into the labour market as experts in several areas.



## MATHEMATICS

The study program of this course is designed for students pretending to develop a solid understanding in fundamental mathematics and highly motivated for a career in fundamental research. The study program is highly flexible, allowing a student to complete the program with courses according to its particular preferences and interests.

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## MATHEMATICS AND COMPUTATION

It is a course with emphasis on computational solutions to mathematical problems and the application of those solutions in science and technology, including computer science. The main scientific areas of the course are computational discrete mathematics, numerical mathematics, and computer science, areas that play a central role in the modern technologies. The applications include, among others, image processing, computer-aided design / manufacturing, secure and reliable communication technology, and formal verification of software.

# CHEMISTRY

**Department of Chemistry**  
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## CHEMISTRY

Provides a solid training in the core areas of chemistry, in both their theoretical and laboratory components, and basic training in complementary areas. The scientific training acquired by graduates in chemistry allows access to a wide range of occupations in industry and services, including chemical industry, food processing, textiles, plastics, cellulose, cork, wood and leather, water industry, business consulting, scientific research institutions. They are also prepared to integrate multidisciplinary technical teams in different technological environments, industrial or educational purposes.



## BIOCHEMISTRY

Prepares professionals with a solid background in the fundamental areas of this science. These include the structure and function of biomolecules, the analysis of molecular structures, the organization and physiology of the cell and molecular biology and genetics.



## ENVIRONMENTAL SCIENCES

Trains professionals with the skills to interpret the natural phenomena that control the state of the environment. These graduates benefit from a specialised and integrated training, allowing them to contribute to technical and/or political decision-making based on extensive scientific criteria. They are also prepared to intervene in terms of spatial planning, nature conservation, environmental monitoring and risk control, in different professional fields.

master degrees [2 years]

## **MEDICINAL CHEMISTRY**

The main goal of this course is to train professionals with skills in the design, synthesis and development of new drugs for diagnostic and therapeutic purpose. The medicinal chemist is prepared to work in pharmaceutical industries, research laboratories, commercial departments and technology-based industries, integrated in multidisciplinary teams, interacting with experts from different fields from theoretical chemistry to biology.



## **CHEMICAL ANALYSIS AND CHARACTERISATION TECHNIQUES**

Provides a solid theoretical background in analytical and in advanced characterisation techniques with a strong laboratorial component and training in the area of quality control. The graduates are qualified to enter the labour market in analytical laboratories in the areas of quality control, food chemistry, forensic chemistry, agrochemical and chemical industry, among others. They can also integrate scientific research and product development teams.



## **Escola de Ciências**

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