

# MASTER OF SCIENCE IN BIOCHEMISTRY AND BIOTECHNOLOGY

MAJORS: BIOINFORMATICS AND SYSTEM BIOLOGY - MICROBIAL BIOTECHNOLOGY - PLANT BIOTECHNOLOGY - BIOMEDICAL BIOTECHNOLOGY - BIOCHEMISTRY AND STRUCTURAL BIOLOGY

MINORS: ECONOMICS AND BUSINESS ADMINISTRATION - INTERDISCIPLINARY COMBINATION

120 ECTS CREDITS - LANGUAGE: ENGLISH

## WHAT

The Master in Biochemistry and Biotechnology not only offers scientists a thorough knowledge of biochemistry, molecular biology, genetics, cell biology and physiology but also the skills to use biochemical and biotechnological techniques on plants, animals or humans in a creative and inventive manner. With our programme, we also initiate students in the interesting world of bioinformatics.

In addition, the curriculum also has a social dimension: to apply research and knowledge for the benefit of humanity and society. This social involvement is reflected in research on the origin and treatment of all kinds of illnesses (such as cancer, chronic inflammation and metabolic diseases), research on the improvement of plants (sustainable food production, production of food with improved nutritional quality, production of biofuels) and research on the use of micro-organisms in certain chemical processes (detoxification of contaminants).

Our curriculum is founded on a close interaction between education and research, which is in turn based on the solid and world-famous research tradition of the three departments involved.

## STRUCTURE

Our Master's curriculum contains Dutch-taught as well as English-taught course units, but we offer a fully English-taught curriculum as well. The two-year Master's programme (120 credits) consists of four modules of thirty credits each:

- common general course units (general, broadening)
- set of major course units (specialising)
- set of minor course units (broadening)
- Master's dissertation (practical training).

The Master's programme offers five specialising **majors**:

- the Bio-informatics and Systems Biology major is based on the recent need for bio-computing and computational biology for the processing of the vast amount of data generated by the biological information flow at different levels (genome, transcriptome, proteome, interactome, signalosome);
- the Biochemistry and Structural Biology major focuses on the determination of protein structures and the study of how molecular 'machines' function;
- the Biomedical Biotechnology major studies the relation between basic cell biological processes and pathological processes (inflammation, cancer, metabolic illnesses) and also pays attention to biomedical applications such as the development of new vaccines and new therapies;
- the Microbial Biotechnology major studies microbial

diversity and functionality, and applies the fundamental knowledge of the molecular genetics of micro-organisms such as bacteria, yeast, moulds and viruses in a broad variety of biotechnological applications;

- the Plant Biotechnology major aims at the development of biotechnological applications of plants in agriculture (e.g. disease resistance or drought tolerance), production of biofuels and the biosynthesis of products with medical applications.

The major is supported by a project course unit (6 credits) in the first-year curriculum and a Master's dissertation (30 credits) in the second-year curriculum.

The Master's programme offers three broadening **minors**:

- the Research minor offers the students an extra speciality, to be chosen from the remaining majors, as well as an additional project course unit (this minor is particularly interesting for English-speaking students);
- the Economics and Business Administration minor offers an introduction to different aspects of business life;
- the Interdisciplinary Combination minor allows for the combination of a major with a coherent set of course units from a different discipline (informatics, chemistry, engineering sciences,...).

The second-year curriculum contains a research project (i.e. the **Master's dissertation**) of thirty credits. Completing the Master's dissertation is a requirement for any student who wants to obtain their Master's degree. The Master's dissertation is an original piece of research. Its aim is to develop and strengthen the students' research skills.

Students choose a topic and receive guidance from a supervisor. The Master's dissertation consists of a literature review, practical research, and an original analysis of the chosen topic.

In addition to the (domain) Master's programme described above, you can also choose a Master's Programme in Teaching (in Dutch: *Educatieve Master*). The *Educatieve Master*, however, is a Dutch-taught programme. Find out more at [www.ugent.be/educatievemaster](http://www.ugent.be/educatievemaster) (in Dutch).

## LABOUR MARKET

A high number (between 40-60% in the past five years) of our current graduates starts doctoral studies, with most of them graduating successfully. Ghent University has a strong research tradition in the domain of biochemistry and biotechnology, which leads to highly qualified PhDs in an internationally competitive research environment. Later, these PhDs find their way to national and international

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universities, research institutions and a growing number of young biotechnological companies.

In view of the increasing use of biochemical and biotechnological methods and production strategies increases in the health care and the environmental sectors, as well as in the food, the agricultural and the chemical industries, there is and will continue to be a steady demand for biochemists and biotechnologists with a solid academic and practical education.

Given our study programme's broad education in the basic sciences, its combination of chemistry and biology, and its practical and research-oriented aspects, our graduates enter the labour market well-prepared. They find their way into various fields of employment: scientific research at universities, research centres, R&D in companies, the pharmaceutical industry, cosmetics companies, laboratories for medical analysis, the food industry, fermentation industry, agricultural industry, petrochemical industry, chemical industry, biotechnological companies, companies in environmental technology, public services for water treatment, the environmental sector etc.

Finally, Biochemistry and Biotechnology graduates often end up in secondary education (at Master's level) or higher education (at PhD level).

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## TOELATINGSVOORWAARDEN VOOR HOUDERS VAN EEN VLAAMS DIPLOMA

### 1 **Rechtstreeks:**

- Bachelor in de biochemie en de biotechnologie
- Bachelor of Molecular Biotechnology
- Master in de industriële wetenschappen: biochemie

### 2 **Na het met succes voltooien van een**

#### **voorbereidingsprogramma:**

#### **60 SP**

- Bachelor in de bio-ingenieurswetenschappen
- Bachelor in de biologie
- Bachelor in de biomedische wetenschappen
- Bachelor in de biowetenschappen
- Bachelor in de chemie
- Bachelor in de diergeneeskunde
- Bachelor in de farmaceutische wetenschappen

#### **aantal studiepunten te bepalen door de faculteit**

- Bachelor in de industriële wetenschappen: chemie

### 3 **Na het met succes voltooien van een**

#### **schakelprogramma:**

#### **90 SP**

#### a opleidingen nieuwe structuur:

- Bachelor in de agro- en biotechnologie, afstudeerrichting: biotechnologie
- Bachelor in de biomedische laboratoriumtechnologie, afstudeerrichting: farmaceutische en biologische laboratoriumtechnologie
- Bachelor in de biomedische laboratoriumtechnologie, afstudeerrichting: medische laboratoriumtechnologie
- Bachelor in de chemie, afstudeerrichting: biochemie
- Bachelor in de chemie, afstudeerrichting: chemie
- Bachelor in de chemie, afstudeerrichting: milieuzorg

#### b opleidingen oude structuur:

- Gegradueerde in chemie, optie biochemie
- Gegradueerde in chemie, optie chemie
- Gegradueerde in chemie, optie milieuzorg
- Gegradueerde in chemie, optie procestechnieken
- Gegradueerde in de medische laboratoriumtechnologie
- Gegradueerde in farmaceutische en biologische technieken

## ADMISSION REQUIREMENTS FOR INTERNATIONAL DEGREE STUDENTS

The course is open to students with at least a bachelor's degree in the field of biochemistry and biotechnology with minimum 180 credits.

Information on admission requirements and the administrative procedure for admission on the basis of a diploma obtained abroad, can be found on the following page: [www.ugent.be/prospect/en/administration/enrolment-or-registration](http://www.ugent.be/prospect/en/administration/enrolment-or-registration).

## LANGUAGE REQUIREMENTS

Language requirements Dutch: no language requirements  
English: CEFR level B2

The language requirements for this study programme can be found on: [www.ugent.be/languagerequirements](http://www.ugent.be/languagerequirements)

## PRACTICAL INFORMATION

### **Study programme**

[studiekiezer.ugent.be/master-of-science-in-biochemistry-and-biotechnology-en/programma](http://studiekiezer.ugent.be/master-of-science-in-biochemistry-and-biotechnology-en/programma)

### **Information sessions**

#### **Graduation Fair**

[afstudeerbeurs.gent/en/students/further-studies](http://afstudeerbeurs.gent/en/students/further-studies)

### **Enrolling institution**

Information on enrolment at Ghent University.

### **Application Deadline (for International degree students)**

For students who **need a visa**: before 1st of April

For students who **do not need a visa**: before 1st of June

Read more

### **Tuition fee**

More information is to be found on: [www.ugent.be/tuitionfee](http://www.ugent.be/tuitionfee)

### **Learning path counsellor**

Sanne Kiekens

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