

# MASTER IN BIOCHEMISTRY AND BIOTECHNOLOGY

MAJORS: BIO-INFORMATICS AND SYSTEM BIOLOGY • BIOCHEMISTRY AND STRUCTURAL BIOLOGY • BIOMEDICAL BIOTECHNOLOGY • MICROBIAL BIOTECHNOLOGY • PLANT BIOTECHNOLOGY

MINORS: RESEARCH • ECONOMICS AND BUSINESS ADMINISTRATION • INTERDISCIPLINARY COMBINATION

120 ECTS CREDITS – LANGUAGE: ENGLISH – DEGREE: MASTER OF SCIENCE

## COURSE CONTENT

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

The training in biochemistry and biotechnology also has a social dimension: to apply research and knowledge in favour 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).

There is a close interaction between education and research in the biochemistry and biotechnology programme, based on a strong and world-famous research tradition of the three departments involved.

## COURSE STRUCTURE

The master's programme of biochemistry and biotechnology offers courses in English and Dutch. It is possible to choose a complete curriculum of English courses. The two-year master's programme (120 credits) consists of four modules of 30 credits each:

- common general courses (general, broadening),
- major course package (specialising),
- minor course package (broadening),
- master's dissertation (practical training).

The master's programme offers five specialising majors:

- the major Bio-informatics and System Biology is based on the recent need for bio-computing and computational biology for the processing of the vast amount of data generated from the biological information flow on different levels (genome, transcriptome, proteome, interactome, signalosome);
- the major Biochemistry and Structural Biology focuses on the determination of protein structures and the study of the functioning of molecular 'machines';
- the major Biomedical Biotechnology studies the relation between basic cell biological processes and pathological processes (inflammation, cancer, metabolic illnesses) and pays also attention to biomedical applications such as the development of new vaccines and new therapies;
- the major Microbial Biotechnology 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 major Plant Biotechnology 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 training period (6 credits) in the first master and a master dissertation (30 credits) in the second master.

The master's programme offers three broadening minors:

- The minor Research offers the students an extra speciality, chosen from the remaining majors, as well as an extra training period (this minor is particularly interesting for English speaking students);
- The minor Economics and Business Administration offers an introduction to different aspects of business life;
- The minor Interdisciplinary Combination permits to combine a major with a coherent package of courses from a different field (informatics, chemistry, engineering sciences ...).

In the second year, a research project (master's dissertation) of 30 credits is scheduled. The master's dissertation is a requirement for every student to obtain a master's degree. The master's dissertation is an original piece of research work. It aims to develop and strengthen the research capacity skills of the students. The student selects a topic and is given guidance by a supervisor. The master's dissertation consists of a literature review part, practical research and an original analysis of the topic.

If you want to combine your master's degree with a teacher's degree, then there is the option of following an 'Educatieve master' instead of the above described master. The 'Educatieve master' however is a Dutch taught programme. More information can be found on [www.ugent.be/educatievemaster](http://www.ugent.be/educatievemaster).

## CAREER PERSPECTIVES

A very large number of the current graduates in biochemistry and biotechnology (between 40-60% in the past five years) starts doctoral studies; most of them graduate 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 doctors find their way to national and international universities, research institutions and a growing number of young biotechnological companies.

The use of biochemical and biotechnological methods and production strategies increases in health care, the environmental sector, the food industry, the agricultural industry, the chemical industry. This implies that there is and will be a demand for academically educated, but also practically trained biochemists and biotechnologists. Given the broad scientific basic education, the combination of chemistry and biology, the practical and research-oriented aspects of the study programme, the biochemist and the biotechnologist are well trained for the job market.

The fields of employment are scientific research at universities, research centers, R&D in companies, pharmaceutical industry, cosmetics companies, laboratories for medical analysis, food industry, fermentation industry, agricultural industry, petrochemical industry, chemical industry, biotechnological companies, companies in environmental technology, public services for water treatment, the environmental sector.

Finally, graduates in biochemistry and biotechnology often end up in education, both at the level of the secondary schools (for masters) and at the level of the colleges of higher education (for doctors).

# MASTER IN BIOCHEMISTRY AND BIOTECHNOLOGY

120 ECTS CREDITS – LANGUAGE: ENGLISH – DEGREE: MASTER OF SCIENCE

## TOELATINGSVOORWAARDEN VOOR HOUDERS VAN EEN VLAAMS DIPLOMA

### Rechtstreeks:

- Ba biochemie en biotechnologie
- Ma industriële wetenschappen: biochemie
- Ba Molecular Biotechnology (GUGC Korea)

### Via schakelprogramma: (90 studiepunten)

- Ba agro- en biotechnologie, afstudeerrichting biotechnologie
  - Ba biomedische laboratoriumtechnologie
  - (professionele) Ba chemie, afstudeerrichtingen:
    - biochemie
    - milieuzorg
    - chemie
- opleiding(en) oude structuur:*
- gegradueerde chemie
  - gegradueerde medische laboratoriumtechnologie
  - gegradueerde farmaceutische en biologische technieken

### Via voorbereidingsprogramma: (60 studiepunten)

- Ba biologie
- Ba chemie
- Ba bio-ingenieurswetenschappen
- Ba biomedische wetenschappen
- Ba farmaceutische wetenschappen
- Ba diergeneeskunde
- Ba biowetenschappen
- Ba industriële wetenschappen: chemie

### TAAL

Je voldoet aan de taalvoorwaarden op basis van je Vlaams diploma.

## PRAKTISCHE INFORMATIE

### Studieprogramma:

<https://studiegids.ugent.be>

> faculteiten > opleidingstypes > ga naar de opleiding van je keuze

### Infomomenten

#### Masterbeurs

[www.ugent.be/masterbeurs](http://www.ugent.be/masterbeurs)

### Trajectbegeleiding

Beata De Vliegheer

T 09 264 50 53 – [beata.devliegheer@ugent.be](mailto:beata.devliegheer@ugent.be)

### Meer info

Afdeling Studieadvies – Campus Ufo, Ufo,  
Sint-Pietersnieuwstraat 33, 9000 Gent, T 09 331 00 31  
[studieadvies@ugent.be](mailto:studieadvies@ugent.be) – [www.ugent.be/studieadvies](http://www.ugent.be/studieadvies)

### Contact

Ghent University – Faculty of Sciences

Student Administration Office

Campus Sterre, Building S2, 3rd floor, Krijgslaan 281, B-9000 Gent

Mr. Joeri Delamane

T +32 (0)9 264 50 50 – [joeri.delamane@ugent.be](mailto:joeri.delamane@ugent.be)

# MASTER IN BIOCHEMISTRY AND BIOTECHNOLOGY

120 ECTS CREDITS – LANGUAGE: ENGLISH – DEGREE: MASTER OF SCIENCE

## ADMISSION REQUIREMENTS FOR INTERNATIONAL DEGREE STUDENTS

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

### LANGUAGE

More information regarding the required knowledge of English:  
[www.ugent.be/specificlanguage](http://www.ugent.be/specificlanguage)

## PRACTICAL INFORMATION

### Study programme:

[www.ugent.be/coursecatalogue](http://www.ugent.be/coursecatalogue)  
> by Faculty > Programme types > select your programme

### Application deadline for international degree students

- for students who need a visa: 1st of March
  - for students who do not need a visa: 1st of June
- [www.ugent.be/deadline](http://www.ugent.be/deadline)

### Enrolling institution

Ghent University

### Tuition fee

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

Last update: January 2020.

### Contact

Ghent University – Faculty of Sciences  
Student Administration Office  
Campus Sterre, Building S2, 3rd floor, Krijgslaan 281, B-9000 Gent  
Mr. Joeri Delamane  
T +32 (0)9 264 50 50 – [joeri.delamane@ugent.be](mailto:joeri.delamane@ugent.be)