MASTER OF SCIENCE IN BIOINFORMATICS (ENGINEERING)

120 ECTS CREDITS – LANGUAGE: ENGLISH

WHAT

Recent technological advances have changed our view on life science research dramatically and have turned biology into a data-driven science. It is in this context that bioinformatics, a booming interdisciplinary field, has quickly evolved from a new research field into a basic discipline. Bioinformatics aims at gaining a better and preferentially more quantitative molecular understanding of cellular processes by integrating and modelling high-throughput molecular data. As a bioinformatician, you will become an interdisciplinary engineer who can develop or use state-of-the art statistical and computer science techniques to mine molecular data in order to answer fundamental or applied biological and biomedical questions.
The Master of Science in Bioinformatics programme:

- offers specialised tracks tuned to your specific interests and background (Systems Biology, Bioscience Engineering or Engineering track), which prepare you for different job profiles in the field of bioinformatics (bioinformatics scientist or bioinformatics engineer, respectively);
- offers both in-depth theoretical and data analytical/problem-solving skills;
- is embedded in a strong bioinformatics and biotechnology research environment, located at the Faculties of Sciences, Medicine and Health Sciences, Bioscience Engineering and Engineering and Architecture. It is also affiliated with VIB and IMEC.

Master of Science in Bioinformatics: Engineering

Bioinformatics engineers are skilled in the development of new algorithms and complex software implementations with a primary focus on the field of bioinformatics, but equally applicable beyond. The biology-oriented module will provide you with the basic knowledge to understand a data-driven biology problem. The rest of the curriculum largely focuses on advanced engineering and computer science techniques (Engineering module) that elaborate on the already advanced knowledge obtained in the Bachelor's programme. The Applied Informatics module will familiarize you with the data specificities of bioinformatics (preprocessing techniques, noise and potential biases, assumptions, etc.), and will allow you to acquire the interdisciplinary skill set that is essential for success in modern science and engineering. The Master's dissertation focuses on a research topic. In your curriculum there is opportunity to do an internship to familiarise yourself with the role and expectations of a bioinformatics scientist in the industry or at a government agency.

STRUCTURE

LABOUR MARKET

Technological advances have turned biology into a data-driven science. The wealth of molecular data enables key discoveries in biology, ecology and molecular evolution, drives innovation in the biotech and pharma industry and supports medical and governmental decision-making. However, the power of using these data for innovation depends on interdisciplinary skills to analyse, integrate and interpret the data.
There is thus an urgent need for bioinformatics scientists and engineers with an interdisciplinary mindset. There is currently a large discrepancy between the exponential increase of biological data (28% each year) and the number of newly graduated bioinformaticians (increase of only 5.8%) who typically find a job in agro, biotech and pharma industry, in research and government agencies, and in genetics centres and hospitals. Because of their interdisciplinary and analytical skill sets, bioinformaticians also find their way into consultancy, spin-offs and data analytics.

GHENT UNIVERSITY

TOELATINGSVOORWAARDEN VOOR HOUDERS VAN EEN VLAAMS DIPLOMA

1 **Rechtstreeks:**
- Bachelor in de computerwetenschappen
- Bachelor in de informatica
- Bachelor in de ingenieurswetenschappen, afstudeerrichting: biomedische ingenieurstechnieken
- Bachelor in de ingenieurswetenschappen, afstudeerrichting: computerwetenschappen
- Bachelor in de ingenieurswetenschappen, afstudeerrichting: elektrotechniek
- Bachelor in de ingenieurswetenschappen, afstudeerrichting: toegepaste natuurkunde
- Bachelor in de ingenieurswetenschappen: computerwetenschappen
- Bachelor in de ingenieurswetenschappen: elektrotechniek
- Bachelor in de ingenieurswetenschappen: toegepaste natuurkunde

2 **Na het met succes voltooien van een voorbereidingsprogramma:**
aantal studiepunten te bepalen door de faculteit
- Bachelor in de biochemie en de biotechnologie
- Bachelor in de wiskunde
- Een diploma van een opleiding 'Bachelor of Science in de bio-ingenieurswetenschappen'
- Een diploma van een opleiding 'Bachelor of Science in de ingenieurswetenschappen' (met uitzondering van 'architectuur')

3 **Rechtstreekse toelating voor het volgen van een brugprogramma (horizontale instroom):**
a opleidingen nieuwe structuur:
- Master in de industriële wetenschappen: elektronica en ICT: multimedia en informatietechnologie
- Master in de industriële wetenschappen: elektronica en ICT: ICT
- Master in de industriële wetenschappen: elektronica-ICT, afstudeerrichting: ingebedde systemen
- Master in de industriële wetenschappen: informatica
- Master of Electronics and ICT Engineering Technology
b opleidingen oude structuur:
- Industrieel ingenieur in elektronica, optie informatie- en communicatietechnieken
- Industrieel ingenieur in informatica

ADMISSION REQUIREMENTS FOR INTERNATIONAL DEGREE STUDENTS

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/admission
Additional information:
- Diploma equivalence of international bachelor's degree students will be checked by the OC on the basis of their individual dossier.
- Students who wish to enrol must add the result of a GRE test to their application, more specifically the result of the Quantitative Reasoning of the General Test. The GRE test result will be assessed using the grading scale of the Faculty of Engineering and Architecture.

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

PRACTICAL INFORMATION

Study programme
studiekiezer.ugent.be/master-of-science-in-bioinformatics-engineering-en/programma

Information sessions
EVOLV
evolv.gent/en/students/further-studies

MASTER OF SCIENCE IN BIOINFORMATICS (ENGINEERING)

120 ECTS CREDITS – LANGUAGE: ENGLISH

Enrolling institution
Information on enrolment at Ghent University.

Application Deadline (for International degree students)
For students who **need a visa**: 1st of April
For students who **do not need a visa**: 1st of June
Read more

Tuition fee
More information is to be found on: www.ugent.be/tuitionfee

Contact
Prof. dr. Kathleen Marchal
kathleen.marchal@ugent.be

Learning path counsellor
Sanne Kiekens
T 09 264 50 53
traject.we@UGent.be

Contact (for international degree students)
Student Administration Office
Mr. Joeri Delamane
T +32 (0)9 264 50 50
joeri.delamane@ugent.be

www.masterbioinformatics.ugent.be

GHENT UNIVERSITY