

Faculty of Sciences, Faculty of Engineering and Architecture, Faculty of Bioscience Engineering

Master of Science in Bioinformatics -- Systems Biology

Language of instruction: English

Programme version 9

## 1 General Courses 33 credits

### 1.1 Applied Bioinformatics Module 33 credits

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C003694 Statistical Genomics <i>Lieven Clement -- Department of Mathematics, Computer Science and Statistics</i> <a href="#">Indicative price: € 0</a>	6			A:1	180
2	C003695 Applied High-throughput Analysis <i>Tim De Meyer -- Department of Data Analysis and Mathematical Modelling</i> <a href="#">Indicative price: € 0</a>	6		1	A:1	180
3	C003696 Genome Biology <i>Klaas Vandepoele -- Department of Plant Biotechnology and Bioinformatics</i> <a href="#">Indicative price: € 0</a>	6		1	A:2	180
4	C004000 Integrative Biology <i>Kathleen Marchal -- Department of Plant Biotechnology and Bioinformatics</i> <a href="#">Indicative price: € 0</a>	3		1	A:2	80
5	C003698 Design Project <i>Jan Fostier -- Department of Information Technology</i> <a href="#">Indicative price: € 0</a>	9		1	A:J	270
6	C004122 Capita Selecta in Bioinformatics <i>Kathleen Marchal -- Department of Plant Biotechnology and Bioinformatics</i> <a href="#">Indicative price: € 0</a>	3			A:1	75

## 2 Courses Related to the Main Subject 78 credits

### 2.1 Systems Biology Module 28 credits

Subscribe to 16 credit units from no less than 1 and no more than 4 modules from the following list.  
Subject to approval by the curriculum committee.

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C003709 Evolutionary Biology <i>Kathleen Marchal -- Department of Plant Biotechnology and Bioinformatics</i> <a href="#">Indicative price: € 0</a>	3		1	A:2	80
2	C003527 Biostatistics <i>Kathleen Marchal -- Department of Plant Biotechnology and Bioinformatics</i> <a href="#">Indicative price: € 0</a>	3		1	B:1	80
3	C003617 Modelling of Biological Systems <i>Steven Maere -- Department of Plant Biotechnology and Bioinformatics</i> <a href="#">Indicative price: € 0</a>	3		2	A:1	80
4	C003086 Proteomics <i>Bart Devreese -- Department of Biochemistry, Physiology and Microbiology</i> <a href="#">Indicative price: € 0</a>	3		2	A:1	80

#### 2.1.1 Microbial Module

Subscribe to no more than 15 credit units from the following list.

Nr	Course	CRDT	Ref	MT1	Session	Study
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1	C002724	<b>Molecular Microbial Ecology</b> <i>Marie Joossens -- Department of Biochemistry, Physiology and Microbiology</i> <a href="#">Indicative price: € 10</a>	3		A:2	80
2	C002714	<b>Host-Parasite Interactions</b> <i>Dirk de Graaf -- Department of Biochemistry, Physiology and Microbiology</i> <a href="#">Indicative price: € 0</a>	3		A:1	80
3	C002719	<b>Microbial Genomics</b> <i>Caroline De Tender -- Department of Biochemistry, Physiology and Microbiology</i> <a href="#">Indicative price: € 0</a>	3		A:2	80
4	C004394	<b>Microbes in Biotechnology</b> <i>Marie Joossens -- Department of Biochemistry, Physiology and Microbiology</i> <a href="#">Indicative price: € 15</a>	6		A:1	150

### 2.1.2 Biochemistry and Structural Biology Module

[Subscribe to no more than 15 credit units from the following list.](#)

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C003525	<b>Structure and Function of Biological Macromolecules</b> <i>Savvas Savvides -- Department of Biochemistry, Physiology and Microbiology</i> <a href="#">Indicative price: € 0</a>	4		A:1	120
2	C003526	<b>Structural Bioinformatics</b> <i>Savvas Savvides -- Department of Biochemistry, Physiology and Microbiology</i> <a href="#">Indicative price: € 0</a>	3		A:1	80
3	C003088	<b>Drug Design</b> <i>Savvas Savvides -- Department of Biochemistry, Physiology and Microbiology</i> <a href="#">Indicative price: € 10</a>	3		A:2	80
4	C003615	<b>Experimental Structural Biology</b> <i>Savvas Savvides -- Department of Biochemistry, Physiology and Microbiology</i> <a href="#">Indicative price: € 0</a>	5		A:2	135

### 2.1.3 Biomedical Oriented Module

[Subscribe to no more than 16 credit units from the following list.](#)

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C002716	<b>Human Genetics and Genetic Diseases</b> <i>Bruce Poppe -- Department of Biomolecular Medicine</i> <a href="#">Indicative price: € 0</a>	3		A:1	80
2	C002722	<b>Molecular Cancer Biology</b> <i>Geert Berx -- Department of Molecular Biology</i> <a href="#">Indicative price: € 0</a>	3		A:1	80
3	C002708	<b>Experimental Molecular Cell Biology</b> <i>Rudi Beyaert -- Department of Molecular Biology</i> <a href="#">Indicative price: € 0</a>	3		A:2	80
4	C002720	<b>Molecular and Experimental Immunology</b> <i>Martin Guillems -- Department of Molecular Biology</i> <a href="#">Indicative price: € 0</a>	3		A:1	80
5	C002738	<b>Transgenetics of Animal Model Organisms</b> <i>Kris Vleminckx -- Department of Molecular Biology</i> <a href="#">Indicative price: € 170</a>	6		A:2	160
6	D012490	<b>Cancer Genetics</b> <i>Kaat Durinck -- Department of Biomolecular Medicine</i> <a href="#">Indicative price: € 0</a>	5		A:2	150
7	D012701	<b>Advanced Human Genetics</b> <i>Sofie Symoens -- Department of Biomolecular Medicine</i> <a href="#">Indicative price: unknown</a>	6		A:2	180
8	D000652	<b>Developmental Genetics and Gene Regulation</b> <i>Elfride De Baere -- Department of Biomolecular Medicine</i> <a href="#">Indicative price: unknown</a>	6		A:1	180
9	D012531	<b>Molecular Immunology</b> <i>Tom Taghon -- Department of Diagnostic Sciences</i> <a href="#">Indicative price: € 0</a>	5		A:2	150
10	C003379	<b>Immunology [nl]</b> <i>Martin Guillems -- Department of Molecular Biology</i>	4		A:2	109

[Indicative price: € 0](#)

#### 2.1.4 Plant Biotechnology Module

[Subscribe to no more than 16 credit units from the following list.](#)

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C003104 Plant Research Technologies <i>Hilde Nelissen -- Department of Plant Biotechnology and Bioinformatics</i> <a href="#">Indicative price: € 0</a>	3			A:1	75
2	C003825 Functional Plant Genomics <i>Klaas Vandepoele -- Department of Plant Biotechnology and Bioinformatics</i> <a href="#">Indicative price: € 0</a>	3			A:1	80
3	C003098 The Plant Cell <i>Lieven De Veylder -- Department of Plant Biotechnology and Bioinformatics</i> <a href="#">Indicative price: € 0</a>	3			A:2	80
4	C003099 Plant Growth and Development <i>Tom Beeckman -- Department of Plant Biotechnology and Bioinformatics</i> <a href="#">Indicative price: € 0</a>	3			A:2	80
5	C003329 Physiological Regulation in Plants <i>Dominique Van Der Straeten -- Department of Biology</i> <a href="#">Indicative price: € 1</a>	5			A:1	150
6	C003100 Molecular Plant Breeding <i>Tom Ruttink -- Department of Plant Biotechnology and Bioinformatics</i> <a href="#">Indicative price: € 97</a>	3			A:1	80

#### 2.1.5 Population Genetics Module

[Subscribe to no more than 15 credit units from the following list.](#)

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C003372 Genetics II [nl] <i>Wout Boerjan -- Department of Plant Biotechnology and Bioinformatics</i> <a href="#">Indicative price: € 84</a>	4			A:1	120
2	C003326 Conservation Genetics <i>Philippe Helsen -- Department of Biology</i> <a href="#">Indicative price: € 50</a>	5			A:2	150
3	C002241 Population Ecology [nl] <i>Luc Lens -- Department of Biology</i> <a href="#">Indicative price: € 0</a>	4			A:1	110
4	C003625 Population Processes [nl] <i>Luc Lens -- Department of Biology</i> <a href="#">Indicative price: € 0</a>	6			A:1	180

#### 2.1.6 Statistics Module

[Subscribe to no more than 16 credit units from the following list.](#)

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C004079 Categorical Data Analysis <i>Beatrijs Moerkerke -- Department of Data-analysis</i> <a href="#">Indicative price: € 15</a>	6			A:1	180
2	C003398 Analysis of Clustered and Longitudinal Data <i>Stijn Vansteelandt -- Department of Mathematics, Computer Science and Statistics</i> <a href="#">Indicative price: € 140</a>	5			A:2	150
3	I001280 Experimental Design <i>Stijn Luca -- Department of Data Analysis and Mathematical Modelling</i> <a href="#">Indicative price: € 15</a>	3			A:2	75
4	C002884 Epidemiology and Clinical Trials <i>Brecht Devleeschauwer -- Department of Translational Physiology, Infectiology and Public Health</i> <a href="#">Indicative price: € 65</a>	5			A:1	150
5	C004413 Causal Machine Learning <i>Stijn Vansteelandt -- Department of Mathematics, Computer Science and Statistics</i> <a href="#">Indicative price: € 5</a>	5			A:2	150

#### 2.1.7 Informatics Module

[Subscribe to no more than 15 credit units from the following list.](#)

Nr	Course	CRDT	Ref	MT1	Session	Study
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1	C003776	System Programming [nl] <i>Filip De Turck -- Department of Information Technology</i> <a href="#">Indicative price: € 0</a>	6		A:1	180
2	C003772	Object Oriented Programming [nl] <i>Kris Coolsaet -- Department of Mathematics, Computer Science and Statistics</i> <a href="#">Indicative price: € 0</a>	6		A:2	180
3	C003771	Databases [nl] <i>Guy De Tré -- Department of Telecommunications and Information Processing</i> <a href="#">Indicative price: € 52</a>	6		A:1	180
4	C004456	Linux for Bioinformatics Environment <i>Herman De Beukelaer -- Department of Plant Biotechnology and Bioinformatics</i> <a href="#">Indicative price: € 0</a>	3		A:2	80

### 2.1.8 Individual Track

Subscribe to no more than 16 credit units from domain-specific or related courses, including courses from other specialisation tracks of the Master of Science in Bioinformatics (if the initial competences are met). Subject to approval by the curriculum committee.

## 2.2 Applied Mathematics and Informatics Module

20 credits

Nr	Course	CRDT	Ref	MT1	Session	Study
1	I002642 Biological Databases <i>Gerben Menschaert -- Department of Data Analysis and Mathematical Modelling</i> <a href="#">Indicative price: unknown</a>	3		1	B:2	90
2	C002732 Programming for Bioinformatics <i>Pieter De Bleser -- Department of Molecular Biology</i> <a href="#">Indicative price: € 0</a>	6		1	A:1	160
3	C003701 Selected Topics in Mathematical Optimization <i>Paul Van Liedekerke -- Department of Data Analysis and Mathematical Modelling</i> <a href="#">Indicative price: € 0</a>	3			A:1	75
4	C003083 Bioinformatics Algorithms <i>Veerle Fack -- Department of Mathematics, Computer Science and Statistics</i> <a href="#">Indicative price: € 0</a>	3		1	A:2	80
5	I002932 Machine Learning for Life Sciences <i>Willem Waegeman -- Department of Data Analysis and Mathematical Modelling</i> <a href="#">Indicative price: € 0</a>	5			A:1	150

## 2.3 Master's Dissertation

30 credits

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C003721 Master's Dissertation <i>N. N.</i> <a href="#">Indicative price: unknown</a>	30		2	A:J	900

## 3 Elective Courses

9 credits

Subscribe to no less than 1 and no more than 2 module from the following list. Subject to approval by the faculty.

### 3.1 Elective Course List

Subscribe to no more than 9 credit units from the following list.

Nr	Course	CRDT	Ref	MT1	Session	Study
1	C004001 Internship <i>N. N.</i> <a href="#">Indicative price: unknown</a>	6			A:1	150
2	A003107 Advanced Academic English <i>Geert Jacobs -- Department of Linguistics</i> <a href="#">Indicative price: € 0</a>	3	UKV		A:1, B:2	90

### 3.2 Elective Courses UGent

Subscribe to no more than 9 credit units from the courses of Ghent University including the Intensive Programmes of the Faculty of Bioscience Engineering and the [Ghent University Elective Courses](#). Subject to approval by the curriculum committee.

## Programme related study costs

Type: Laptop

Name: laptop

Indicative price: € 1,000

Optional: No

Fulltime standard learning track year: 1

Available through Student Association : No

Usability and Lifetime within the Course Unit : intensive

Usability and Lifetime within the Study Programme : intensive

Usability and Lifetime after the Study Programme : regularly

### Teaching

When a course is not taught (solely) in the programme's language of instruction, the effectively used languages are indicated in square brackets following the cours name, using the following ISO codes:

bg: Bulgarian	de: German	es: Spanish	ja: Japanese	pl: Polish	sh: Kroatian/Serbian	zh: Chinese
cs: Czech	el: Greek	fr: French	nl: Dutch	pt: Portuguese	sl: Slovene	
da: Danish	en: English	it: Italian	no: Norwegian	ru: Russian	sv: Swedish	

### Semester

Semesters are indicated by their number (1 or 2); semester 3 represents the summer period and J indicates a course spanning semesters 1 and 2. When a capital letter precedes a semester number, the course has multiple offerings. The letter indicates the offering concerned.

When a semester is shown in brackets, the course is not offered this year in the specific offering.

The offering frequency and first year of offering are indicated by the following codes:

a: bi-annually	c: annually, from 2025-2026	f: annually, from 2026-2027	i: annually, from 2027-2028
b: tri-annually	d: bi-annually, from 2025-2026	g: bi-annually, from 2026-2027	j: bi-annually, from 2027-2028
	e: tri-annually, from 2025-2026	h: tri-annually, from 2026-2027	k: tri-annually, from 2027-2028

### Learning materials

The prices stated are indicative and subject to fluctuations.

The list of learning materials per course unit can be found in the course sheets.