GHENT UNIVERSITY

Study Programme

Academic year 2025-2026

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 10

1 General Courses 33 credits

1.1 Applied Bioinformatics Module 33 credits

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C003694	Statistical Genomics *Christophe Vanderaa -- Department of Mathematics, Computer Science and Statistics*	6			A:1	180
2	C003695	Applied High-throughput Analysis *Tim De Meyer -- Department of Data Analysis and Mathematical Modelling*	6		1	A:1	180
3	C003696	Genome Biology *Klaas Vandepoele -- Department of Plant Biotechnology and Bioinformatics*	6		1	A:2	180
4	C004000	Integrative Biology *Kathleen Marchal -- Department of Plant Biotechnology and Bioinformatics*	3		1	A:2	80
5	C003698	Design Project *Kathleen Marchal -- Department of Plant Biotechnology and Bioinformatics*	9		1	A:J	270
6	C004122	Capita Selecta in Bioinformatics *Kathleen Marchal -- Department of Plant Biotechnology and Bioinformatics*	3			A:1	75

2 Courses Related to the Main Subject 78 credits

2.1 Systems Biology Module 29 credits

Subscribe to 17 credit units from no less than 1 and no more than 4 modules from the following list. At least one course should be from the statistics or the informatics module.
Subject to approval by the curriculum committee.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C003709	Evolutionary Biology *Quinten Bafort -- Department of Plant Biotechnology and Bioinformatics*	3		1	A:2	80
2	C003527	Biostatistics *Caroline De Tender -- Department of Biochemistry, Physiology and Microbiology*	3		1	B:1	80
3	C003617	Modelling of Biological Systems *Steven Maere -- Department of Plant Biotechnology and Bioinformatics*	3		2	A:1	80
4	C003086	Proteomics *Bart Devreese -- Department of Biochemistry, Physiology and Microbiology*	3		2	A:1	80

2.1.1 Microbial Module

Subscribe to no more than 12 credit units from the following list.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C002724	Molecular Microbial Ecology *Marie Joossens -- Department of Biochemistry, Physiology and Microbiology*	3			A:2	80
2	C002714	Host-Parasite Interactions *Dirk de Graaf -- Department of Biochemistry, Physiology and Microbiology*	3			A:1	80
3	C002719	Microbial Genomics *Caroline De Tender -- Department of Biochemistry, Physiology and Microbiology*	3			A:2	80
4	C004394	Microbes in Biotechnology *Marie Joossens -- Department of Biochemistry, Physiology and Microbiology*	6			A:1	150

2.1.2 Biochemistry and Structural Biology Module

Subscribe to no more than 12 credit units from the following list.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C003525	Structure and Function of Biological Macromolecules *Savvas Savvides -- Department of Biochemistry, Physiology and Microbiology*	4			A:1	120
2	C003526	Structural Bioinformatics *Savvas Savvides -- Department of Biochemistry, Physiology and Microbiology*	3			A:1	80
3	C003088	Drug Design *Savvas Savvides -- Department of Biochemistry, Physiology and Microbiology*	3			A:2	80
4	C003615	Experimental Structural Biology *Savvas Savvides -- Department of Biochemistry, Physiology and Microbiology*	5			A:2	135

2.1.3 Biomedical Oriented Module

Subscribe to no more than 12 credit units from the following list.

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

2.1.4 Plant Biotechnology Module

Subscribe to no more than 17 credit units from the following list.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C003104	Plant Research Technologies *Hilde Nelissen -- Department of Plant Biotechnology and Bioinformatics*	3			A:1	75
2	C003825	Functional Plant Genomics *Lieven De Veylder -- Department of Plant Biotechnology and Bioinformatics*	3			A:1	80
3	C003098	The Plant Cell *Daniël Van Damme -- Department of Plant Biotechnology and Bioinformatics*	3			A:2	80
4	C003099	Plant Growth and Development *Moritz Nowack -- Department of Plant Biotechnology and Bioinformatics*	3			A:2	80
5	C003329	Physiological Regulation in Plants *Dominique Van Der Straeten -- Department of Biology*	5			A:1	150
6	C003100	Molecular Plant Breeding *Tom Ruttink -- Department of Plant Biotechnology and Bioinformatics*	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] *Wout Boerjan -- Department of Plant Biotechnology and Bioinformatics*	4			A:1	120
2	C003326	Conservation Genetics *Philippe Helsen -- Department of Biology*	5			A:2[a]	150

3	C002241	Population Ecology [nl] *Luc Lens -- Department of Biology*	4		A:1	110
4	C004528	Ecological Modelling *Dries Bonte -- Department of Biology*	4		A:1	120
5	C003625	Population Processes [nl] *Luc Lens -- Department of Biology*	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 *Beatrijs Moerkerke -- Department of Data-analysis*	6			A:1	180
2	C003398	Analysis of Clustered and Longitudinal Data *Johan Steen -- Department of Mathematics, Computer Science and Statistics*	5			A:2	150
3	I001280	Experimental Design *Stijn Luca -- Department of Data Analysis and Mathematical Modelling*	3			A:2	75
4	C002884	Epidemiology and Clinical Trials *Brecht Devleesschauwer -- Department of Translational Physiology, Infectiology and Public Health*	5			A:1	150
5	C004413	Causal Machine Learning *Stijn Vansteelandt -- Department of Mathematics, Computer Science and Statistics*	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
1	C003776	System Programming [nl] *Filip De Turck -- Department of Information Technology*	6			A:1	180
2	C003772	Object Oriented Programming [nl] *Kris Coolsaet -- Department of Mathematics, Computer Science and Statistics*	6			A:2	180
3	C003771	Databases [nl] *Guy De Tré -- Department of Telecommunications and Information Processing*	6			A:1	180
4	I003054	Computer Vision for Life Sciences *Jan Verwaeren -- Department of Data Analysis and Mathematical Modelling*	5			A:2	150
5	C004456	Linux for Bioinformatics Environment *Svitlana Lukicheva -- Department of Plant Biotechnology and Bioinformatics*	3			A:2	80

2.1.8 Individual Track

Subscribe to no more than 17 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 19 credits

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C004611	Biological Databases *Wim Van Criekinge -- Department of Data Analysis and Mathematical Modelling*	3		1	A:2	90
2	C003701	Selected Topics in Mathematical Optimization *Paul Van Liedekerke -- Department of Data Analysis and Mathematical Modelling*	3			A:1	75
3	C003083	Bioinformatics Algorithms *Veerle Fack -- Department of Mathematics, Computer Science and Statistics*	3		1	A:2	80
4	I003053	Machine Learning for Life Sciences *Willem Waegeman -- Department of Data Analysis and Mathematical Modelling*	4			A:1	120
5	C004612	Advanced AI for Bioinformatics *Willem Waegeman -- Department of Data Analysis and Mathematical Modelling*	6			A:1	180

2.3 Master's Dissertation 30 credits

Nr	Course		CRDT	Ref	MT1	Session	Study
1	C003721	Master's Dissertation	30		2	A:J	900

3 Elective Courses 9 credits

Subscribe to no less than 1 and no more than 2 modules from the following list.
Subject to approval by the curriculum committee.

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	6			A:1	150
2	A003107	Advanced Academic English *Geert Jacobs -- Department of Linguistics*	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.

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 in 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 2026-2027	f: annually, from 2027-2028	i: annually, from 2028-2029
b: tri-annually	d: bi-annually, from 2026-2027	g: bi-annually, from 2027-2028	j: bi-annually, from 2028-2029
	e: tri-annually, from 2026-2027	h: tri-annually, from 2027-2028	k: tri-annually, from 2028-2029