GHENT UNIVERSITY

Study Programme

Academic year 2022-2023

Faculty of Bioscience Engineering

Master of Science in Bioscience Engineering: Cell and Gene Biotechnology

Language of instruction: English

Programme version 1

1 General Courses — 56 credits

1.1 Molecular Biology — 7.0 credits

Nr	Course		CRDT	Ref	MT1	Session	Study
1	I002615	Protein Chemistry Els Van Damme -- Department of Biotechnology	4		1	A:1	120
2	I002621	Gene Regulation and Epigenetics Tina Kyndt -- Department of Biotechnology	3		1	A:2	90

1.2 Biotechnology — 15.0 credits

Nr	Course		CRDT	Ref	MT1	Session	Study
1	I002611	Plant Biotechnology Godelieve Gheysen -- Department of Biotechnology	5		1	A:2	150
2	I002612	Industrial Biotechnology Wim Soetaert -- Department of Biotechnology	5		1	A:1	150
3	I002613	Human and Animal Biotechnology Daisy Vanrompay -- Department of Animal Sciences and Aquatic Ecology	5		1	A:2	150

1.3 Biological Data Sciences — 10.0 credits

Nr	Course		CRDT	Ref	MT1	Session	Study
1	I002610	Bioinformatics Wim Van Criekinge -- Department of Data Analysis and Mathematical Modelling	5		1	A:1	150
2	I002616	Genome Analysis Tim De Meyer -- Department of Data Analysis and Mathematical Modelling	5		1	A:2	150

1.4 Engineering and Technology — 12.0 credits

Nr	Course		CRDT	Ref	MT1	Session	Study
1	I002618	Process Engineering 2 Paul Van der Meeren -- Department of Green Chemistry and Technology	5		1	A:1	150
2	I001280	Experimental Design Stijn Luca -- Department of Data Analysis and Mathematical Modelling	3		1	A:2	75
3	I002617	Bio-imaging and Image Informatics Andre Skirtach -- Department of Biotechnology	4		1	A:1	120

1.5 Society and Scientific Communication and Integrity — 12.0 credits

Nr	Course		CRDT	Ref	MT1	Session	Study
1	I002614	Microbiomics Nico Boon -- Department of Biotechnology	4		1	A:1	120
2	I002619	Management for Engineers Jeroen Buysse -- Department of Agricultural Economics	4		2	A:1	120
3	I002620	Case Studies in Biotechnology Tom Van de Wiele -- Department of Biotechnology	4		2	A:J	120

2 Majors

Subscribe to 1 major from the following list.

Full-time standard learning track:
Students can choose which of the elective and major course units are taken in the first respectively the second standard learning track

year (unless otherwise specified);
in combination with the general course units, students take a total of 54 to 66 credits per standard learning track year. The sum of the total number of credits taken up over the 2 standard learning track years must be 120 credits.

2.1 Major Red Biotechnology: Biomedical — 22.0 credits

Subscribe to 22 credit units from the following list.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	I002622	Immunology Daisy Vanrompay -- Department of Animal Sciences and Aquatic Ecology	5			A:2	150
2	I002623	Interphase Processes of Host-associated Micro-organisms Tom Van de Wiele -- Department of Biotechnology	5			A:1	150
3	I002624	Biochemical and Molecular Nutrition John Van Camp -- Department of Food Technology, Safety and Health	3			A:1	90
4	D012549	Stem Cell Biology and Reprogramming BJORN HEINDRYCKX -- Department of Human Structure and Repair	4			A:2	120
5	I002625	Cancer Genetics Franki Speleman -- Department of Biomolecular Medicine	5			A:2	150

2.2 Major Green Biotechnology: Plant — 22.0 credits

Subscribe to 22 credit units from the following list.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	I002626	Plants, Pathogens and Pests Monica Höfte -- Department of Plants and Crops	5			A:2	150
2	I002627	Plants and Microclimate Kathy Steppe -- Department of Plants and Crops	5			A:1	150
3	I002628	Molecular Plant Breeding Danny Geelen -- Department of Plants and Crops	5			A:1	150
4	I002629	Plant Phenotyping Technologies Kris Audenaert -- Department of Plants and Crops	3			A:2	90
5	I002630	Functional Plant Biology Danny Geelen -- Department of Plants and Crops	4			A:2	120

2.3 Major White Biotechnology: Industrial — 20.0 credits

Subscribe to 20 credit units from the following list.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	I002631	Industrial Fermentation Processes and Downstream Processing Wim Soetaert -- Department of Biotechnology	5			A:2	150
2	I002632	Metabolic Engineering and Modelling of Micro-organisms Marjan De Mey -- Department of Biotechnology	4			A:2	120
3	I002633	Functional (Meta)genomics Inge Van Bogaert -- Department of Biotechnology	4			A:2	120
4	I002634	Synthetic Biology Marjan De Mey -- Department of Biotechnology	4			A:2	120
5	I002635	Enzyme Engineering and Modelling Tom Desmet -- Department of Biotechnology	3			A:1	90

2.4 Major Computational Biology — 22.0 credits

Subscribe to 22 credit units from the following list.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	I002642	Biological Databases Wim Van Criekinge -- Department of Data Analysis and Mathematical Modelling	5			A:2	150
2	I002091	Predictive Modelling Willem Waegeman -- Department of Data Analysis and Mathematical Modelling	5			B:1	150
3	C003701	Selected Topics in Mathematical Optimization Paul Van Liedekerke -- Department of Data Analysis and Mathematical Modelling	3			A:2	75
4	I002636	Spatio-temporal Models Jan Baetens -- Department of Data Analysis and Mathematical Modelling	3			B:2	90
5	C002739	Unix System for Bioinformatics Environment Lieven Sterck -- Department of Plant Biotechnology and Bioinformatics	3			A:2	80
6	C004000	Integrative Biology Kathleen Marchal -- Department of Plant Biotechnology and Bioinformatics	3			A:2	80

3 Elective Courses

Subscribe to 14 credit units for IMCEGBmajorWhite or 12 credit units for other IMCEGBmajors from no less than 1 and no more than 5 modules from the following list.
Full-time standard learning track:
Students can choose which of the elective and major course units are taken in the first respectively the second standard learning track year (unless otherwise specified);
in combination with the general course units, students take a total of 54 to 66 credits per standard learning track year. The sum of the total number of credits taken up over the 2 standard learning track years must be 120 credits.

3.1 Courses from the Majors

Subscribe to no more than 12 or 14 credit units from the majors, with the exception of the courses taken within the chosen major.

3.2 Master Specific Courses

Subscribe to no more than 12 or 14 credit units from the following list.
Elective courses complementary to major:
R = major RED
G = major GREEN
W = major WHITE
C = major COMPUTATIONAL

Nr	Course		CRDT	Ref	MT1	Session	Study
1	I002688	Biopharmacy of Biotechnological Drugs Stefaan De Smedt -- Department of Pharmaceutics	3	R		A:2	90
2	I000250	General Virology [nl] Kristien Van Reeth -- Department of Translational Physiology, Infectiology and Public Health	4	R		A:1	100
3	E063671	Biomaterials and Tissue Engineering Peter Dubruel -- Department of Organic Chemistry	5	R		A:1	150
4	I001905	Medical Biotechnology and Parasitology Vrije Universiteit Brussel, Geert Raes	4	R		A:2	117
5	I001965	Applied Immunology [nl] Vrije Universiteit Brussel, Jo Van Ginderachter	5	R		A:2	125
6	I002516	Crop Protection [nl] Benny De Cauwer -- Department of Plants and Crops	5	G		A:1	150
7	I002515	Crop Husbandry [nl] Steven Maenhout -- Department of Plants and Crops	5	G		A:1	150
8	I002743	Monitoring Plant Growth Processes In Vitro and In Vivo [nl] Emmy Dhooghe -- Department of Plants and Crops	6	G		A:1	180
9	I002845	Molecular Entomology N. N.	5	G		(A:2)[g]	150
10	I002675	Chemical Structure Determination Christian Stevens -- Department of Green Chemistry and Technology	4	W		A:1	120
11	I002510	Reaction Kinetics and Reactor Design [nl] Paul Van der Meeren -- Department of Green Chemistry and Technology	5	W		A:2	150
12	I002607	Resource Recovery Technology Ramon Ganigué -- Department of Biotechnology	6	W		A:2	180
13	I002719	Modelling and Simulation with Partial Differential Equations in Practice Ingmar Nopens -- Department of Data Analysis and Mathematical Modelling	5	C		A:1	150
14	I002672	Process Control Kimberly Tumlos Solon -- Department of Data Analysis and Mathematical Modelling	5	C		A:2	150
15	C004122	Capita Selecta in Bioinformatics Kathleen Marchal -- Department of Plant Biotechnology and Bioinformatics	3	C		A:1	75

3.3 Entrepreneurship and Management

Subscribe to no more than 12 or 14 credit units from the following list.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	I002720	Consumer Behaviour and Marketing of Bio-industrial products [nl] Wim Verbeke -- Department of Agricultural Economics	5			A:2	150
2	I001967	Intellectual Property and Valorization Benedikt Sas -- Department of Food Technology, Safety and Health	3			A:2	90
3	C000833	Project Management [nl] Mario Vanhoucke -- Department of Business Informatics and Operations Management	4			A:2	120
4	E076471	Dare to Start Frank Gielen -- Department of Information Technology	3			A:2	90

5	E076460	Dare to Venture Johan Verrue -- Department of Marketing, Innovation and Organisation	4		A:2	120
6	I001949	Entrepreneurship [nl] Petra Andries -- Department of Marketing, Innovation and Organisation	3		A:2	75

3.4 Skills and Attitudes

Subscribe to no more than 12 or 14 credit units from the following list, with no more than 10 credit units with reference a.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	I002637	Internship [nl, en] Paul Van der Meeren -- Department of Green Chemistry and Technology	5	a		A:J	150
2	I002638	International Internship [nl, en] Paul Van der Meeren -- Department of Green Chemistry and Technology	5	a		A:J	150
3	I002639	Extended Internship [nl, en] Paul Van der Meeren -- Department of Green Chemistry and Technology	10	a		A:J	300
4	I002640	Extended International Internship [nl, en] Paul Van der Meeren -- Department of Green Chemistry and Technology	10	a		A:J	300
5	I001944	Bio-ethics Farah Focquaert -- Department of Philosophy and Moral Sciences	3			A:1	75
6	C002668	Scientific Communication in English Geert Jacobs -- Department of Linguistics	5			A:2	150
7	I001784	Seminar [nl, en] Mieke Uyttendaele -- Department of Food Technology, Safety and Health	3			A:J	75
8	I002641	Laboratory Animal Science Katleen Hermans -- Department of Pathobiology, Pharmacology and Zoological Medicine	6			A:1	180

3.5 Open Choice

Subscribe to course units from courses offered at Ghent University and at the alliance partner VUB, including the Ghent University Elective Courses.
A maximum of 2 such courses is allowed.
Maximum 8 credit units language courses are allowed within this master programme.
Subject to approval by the Faculty.

4 Master's Dissertation 30 credits

Nr	Course		CRDT	Ref	MT1	Session	Study
1	I001484	Master's Dissertation Marjan De Mey -- Department of Biotechnology	30			A:J	900

Teaching languages

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 2023-2024	f: annually, from 2024-2025	i: annually, from 2025-2026
b: tri-annually	d: bi-annually, from 2023-2024	g: bi-annually, from 2024-2025	j: bi-annually, from 2025-2026
	e: tri-annually, from 2023-2024	h: tri-annually, from 2024-2025	k: tri-annually, from 2025-2026