

Faculty of Bioscience Engineering

Master of Science in Bioscience Engineering: Cell and Gene Biotechnology

Language of instruction: English

Programme version 3

## 1 General Courses

56 credits

### 1.1 Molecular Biology

7 credits

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

### 1.2 Biotechnology

15 credits

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

### 1.3 Biological Data Sciences

10 credits

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

### 1.4 Engineering and Technology

12 credits

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

### 1.5 Society and Scientific Communication and Integrity

12 credits

Nr	Course	CRDT	Ref	MT1	Session	Study
1	I002614 Microbiomics <i>Nico Boon -- Department of Biotechnology</i>	4		1	A:1	120
2	I002619 Management for Engineers <i>Jeroen Buyse -- Department of Agricultural Economics</i>	4		2	A:1	120
3	I002933 Biotechnology in a Professional and Societal Context <i>Tom Van de Wiele -- Department of Biotechnology</i>	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 credits

[Subscribe to 22 credit units from the following list.](#)

Nr	Course	CRDT	Ref	MT1	Session	Study
1	I002622 Immunology <i>Daisy Vanrompay -- Department of Animal Sciences and Aquatic Ecology</i>	5			A:2	150
2	I002623 Interphase Processes of Host-associated Micro-organisms <i>Tom Van de Wiele -- Department of Biotechnology</i>	5			A:1	150
3	I002624 Biochemical and Molecular Nutrition <i>John Van Camp -- Department of Food Technology, Safety and Health</i>	3			A:1	90
4	D012549 Stem Cell Biology and Reprogramming <i>BJORN HEINDRYCKX -- Department of Human Structure and Repair</i>	4			A:2	120
5	D012490 Cancer Genetics <i>Kaat Durinck -- Department of Biomolecular Medicine</i>	5			A:2	150

## 2.2 Major Green Biotechnology: Plant

22 credits

[Subscribe to 22 credit units from the following list.](#)

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

## 2.3 Major White Biotechnology: Industrial

20 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 <i>Wim Soetaert -- Department of Biotechnology</i>	5			A:2	150
2	I002632 Metabolic Engineering and Modelling of Micro-organisms <i>Marjan De Mey -- Department of Biotechnology</i>	4			A:2	120
3	I002633 Functional (Meta)genomics <i>Inge Van Bogaert -- Department of Biotechnology</i>	4			A:2	120
4	I002634 Synthetic Biology <i>Marjan De Mey -- Department of Biotechnology</i>	4			A:2	120
5	I002635 Enzyme Engineering and Modelling <i>Tom Desmet -- Department of Biotechnology</i>	3			A:1	90

## 2.4 Major Computational Biology

22 credits

[Subscribe to 22 credit units from the following list.](#)

Nr	Course	CRDT	Ref	MT1	Session	Study
1	I002642 Biological Databases <i>Gerben Menschaert -- Department of Data Analysis and Mathematical Modelling</i>	5			A:2	150
2	I002932 Machine Learning for Life Sciences <i>Willem Waegeman -- Department of Data Analysis and Mathematical Modelling</i>	5			A:1	150
3	C003701 Selected Topics in Mathematical Optimization <i>Paul Van Liedekerke -- Department of Data Analysis and Mathematical Modelling</i>	3			A:1	75
4	I002636 Spatio-temporal Models	3				90
5	C004456 Linux for Bioinformatics Environment <i>Herman De Beukelaer -- Department of Plant Biotechnology and Bioinformatics</i>	3			A:2	80
6	C004000 Integrative Biology <i>Kathleen Marchal -- Department of Plant Biotechnology and Bioinformatics</i>	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	I000250 General Virology [nl] <i>Kristien Van Reeth -- Department of Translational Physiology, Infectiology and Public Health</i>	4	R		A:1	100
2	E063671 Biomaterials and Tissue Engineering <i>Peter Dubrue -- Department of Organic Chemistry</i>	5	R		A:1	150
3	I001905 Medical Biotechnology and Parasitology <i>Geert Raes</i>	4	R		A:2	117
4	I001965 Applied Immunology <i>Jo Van Ginderachter -- Vrije Universiteit Brussel</i>	5	R			125
5	J000454 Cutting Edge Technologies for Drug Delivery - Nanomedicines <i>Stefaan De Smedt -- Department of Pharmaceutics</i>	3	R		A:2	90
6	I002516 Crop Protection [nl] <i>Patrick De Clercq -- Department of Plants and Crops</i>	5	G		A:1	150
7	I002515 Crop Husbandry [nl] <i>Steven Maenhout -- Department of Plants and Crops</i>	5	G		A:1	150
8	I002845 Molecular Entomology	5	G		(A:2) <sup>d</sup>	150
9	I002675 Chemical Structure Determination <i>Christian Stevens -- Department of Green Chemistry and Technology</i>	4	W		A:1	120
10	I002510 Reaction Kinetics and Reactor Design [nl] <i>Paul Van der Meeren -- Department of Green Chemistry and Technology</i>	5	W		A:2	150
11	I002607 Resource Recovery Technology <i>Ramon Ganigüé -- Department of Biotechnology</i>	6	W		A:2	180
12	I002672 Process Control <i>Paul Van Liedekerke -- Department of Data Analysis and Mathematical Modelling</i>	5	C		A:2	150
13	C004122 Capita Selecta in Bioinformatics <i>Kathleen Marchal -- Department of Plant Biotechnology and Bioinformatics</i>	3	C		A:1	75
14	I003021 Advanced Biosystems Modelling <i>Paul Van Liedekerke -- Department of Data Analysis and Mathematical Modelling</i>	5	C		A:2	150

#### 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] <i>Wim Verbeke -- Department of Agricultural Economics</i>	5			A:2	150
2	I001967 Intellectual Property and Valorization <i>Benedikt Sas -- Department of Food Technology, Safety and Health</i>	3			A:2	90
3	C000833 Project Management [nl] <i>Mario Vanhoucke -- Department of Business Informatics and Operations Management</i>	4			A:2	120
4	E076471 Dare to Start <i>Wouter Haerick -- Department of Information Technology</i>	3			A:2	90
5	E076460 Dare to Venture <i>Johan Verrue -- Department of Marketing, Innovation and Organisation</i>	4			A:2	120

6	I001949	Entrepreneurship [nl] <i>Petra Andries -- Department of Marketing, Innovation and Organisation</i>	3		A:2	75
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### 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 [en, nl] <i>Paul Van der Meeren -- Department of Green Chemistry and Technology</i>	5	a		A:J	150
2	I002638 International Internship [en, nl] <i>Paul Van der Meeren -- Department of Green Chemistry and Technology</i>	5	a		A:J	150
3	I002639 Extended Internship [en, nl] <i>Paul Van der Meeren -- Department of Green Chemistry and Technology</i>	10	a		A:J	300
4	I002640 Extended International Internship [en, nl] <i>Paul Van der Meeren -- Department of Green Chemistry and Technology</i>	10	a		A:J	300
5	I001944 Bio-ethics <i>Michiel De Proost -- Department of Philosophy and Moral Sciences</i>	3			A:1	75
6	C002668 Scientific Communication in English <i>Geert Jacobs -- Department of Linguistics</i>	5			A:2	150
7	I001784 Seminar <i>Mieke Uyttendaele -- Department of Food Technology, Safety and Health</i>	3				75
8	I002641 Laboratory Animal Science <i>Katleen Hermans -- Department of Pathobiology, Pharmacology and Zoological Medicine</i>	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 <i>Marjan De Mey -- Department of Biotechnology</i>	30		2	A:J	900

#### 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 course name, using the following ISO codes:

bg: Bulgarian	de: German	es: Spanish	ja: Japanese	pl: Polish	sh: Croatian/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