



## 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 Criekeinge -- 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 Buysse -- 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 Dubrule -- 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 Ganigüe -- 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 Verruet -- Department of Marketing, Innovation and Organisation</i>	4			A:2	120

### 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