

Study Programme

Academic year 2024-2025

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 Molecu	lar Biology				7	' credits
Ni	Course		CRDT	Ref	MT1	Session	Study
1	1002615	Protein Chemistry Els Van Damme Department of Biotechnology	4		1	A:1	120
2	1002621	Gene Regulation and Epigenetics Tina Kyndt Department of Biotechnology	3		1	A:2	90
1.	2 Biotech	nology				15	5 credits
Ni	Course		CRDT	Ref	MT1	Session	Study
1	1002611	Plant Biotechnology Laurens Pauwels Department of Biotechnology	5		1	A:2	150
2	1002612	Industrial Biotechnology Wim Soetaert Department of Biotechnology	5		1	A:1	150
3	1002613	Human and Animal Biotechnology Daisy Vanrompay Department of Animal Sciences and Aquatic Ecology	5		1	A:2	150
1.	3 Biologi	cal Data Sciences				10) credits
Nı	[.] Course		CRDT	Ref	MT1	Session	Study
1	1002610	Bioinformatics Wim Van Criekinge Department of Data Analysis and Mathematical Modelling	5		1	A:1	150
2	1002616	Genome Analysis Tim De Meyer Department of Data Analysis and Mathematical Modelling	5		1	A:2	150
1.	4 Engine	ering and Technology				12	credits
N	[.] Course		CRDT	Ref	MT1	Session	Study
1	1002618	Process Engineering 2 Paul Van der Meeren Department of Green Chemistry and Technology	5		1	A:1	150
2	1001280	Experimental Design Stijn Luca Department of Data Analysis and Mathematical Modelling	3		1	A:2	75
3	1002617	Bio-imaging and Image Informatics Andre Skirtach Department of Biotechnology	4		1	A:1	120
1.	5 Society	and Scientific Communication and Integrity				12	credits
Nı	Course		CRDT	Ref	MT1	Session	Study
1	1002614	Microbiomics Nico Boon Department of Biotechnology	4		1	A:1	120
2	1002619	Management for Engineers Jeroen Buysse Department of Agricultural Economics	4		2	A:1	120
3	1002933	Biotechnology in a Professional and Societal Context 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 credits

22 credits

Subscribe to 22 credit units from the following list.

Nr			CRDT	Ref	MT1	Session	Study
1	1002622	Immunology Daisy Vanrompay Department of Animal Sciences and Aquatic Ecology	5			A:2	150
2	1002623	Interphase Processes of Host-associated Micro-organisms Tom Van de Wiele Department of Biotechnology	5			A:1	150
3	1002624	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	D012490	Cancer Genetics Kaat Durinck Department of Biomolecular Medicine	5			A:2	150

2.2 Major Green Biotechnology: Plant

Subscribe to 22 credit units from the following list.

Nr			CRDT F	Ref MT1	Session	Study
1	1002626	Plants, Pathogens and Pests Monica Höfte Department of Plants and Crops	5		A:2	150
2	1002627	Plants and Microclimate Kathy Steppe Department of Plants and Crops	5		A:1	150
3	1002628	Molecular Plant Breeding Danny Geelen Department of Plants and Crops	5		A:1	150
4	1002629	Plant Phenotyping Technologies Kris Audenaert Department of Plants and Crops	3		A:2	90
5	1002630	Functional Plant Biology Danny Geelen Department of Plants and Crops	4		A:2	120
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2.3 Major White Biotechnology: Industrial

20 credits

22 credits

Subscribe to 20 credit units from the following list.

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1	1002631	Industrial Fermentation Processes and Downstream Processing Wim Soetaert Department of Biotechnology	5	A:2	150
2	1002632	Metabolic Engineering and Modelling of Micro-organisms Marjan De Mey Department of Biotechnology	4	A:2	120
3	1002633	Functional (Meta)genomics Inge Van Bogaert Department of Biotechnology	4	A:2	120
4	1002634	Synthetic Biology Marjan De Mey Department of Biotechnology	4	A:2	120
5	1002635	Enzyme Engineering and Modelling Tom Desmet Department of Biotechnology	3	A:1	90

2.4 Major Computational Biology

Subscribe	to 22	credit	units	from	the	following	list.
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Nr			CRDT	Ref	MT1	Session	Study
1	1002642	Biological Databases Gerben Menschaert Department of Data Analysis and Mathematical Modelling	5			A:2	150
2	1002932	Machine Learning for Life Sciences Willem Waegeman Department of Data Analysis and Mathematical Modelling	5			A:1	150
3	C003701	Selected Topics in Mathematical Optimization Paul Van Liedekerke Department of Data Analysis and Mathematical Modelling	3			A:1	75
4	1002636	Spatio-temporal Models	3				90
5	C004456	Linux for Bioinformatics Environment Herman De Beukelaer 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			CRDT			Session	Study
1	1000250	General Virology [nl] Kristien Van Reeth Department of Translational Physiology, Infectiology and Public Health	4	R		A:1	100
2	E063671	Biomaterials and Tissue Engineering Peter Dubruel Department of Organic Chemistry	5	R		A:1	150
3	1001905	Medical Biotechnology and Parasitology Vrije Universiteit Brussel, Geert Raes	4	R		A:2	117
4	1001965	Applied Immunology Vrije Universiteit Brussel, Jo Van Ginderachter	5	R			125
5	J000454	Cutting Edge Technologies for Drug Delivery - Nanomedicines Stefaan De Smedt Department of Pharmaceutics	3	R		A:2	90
6	1002516	Crop Protection [nl] Patrick De Clercq Department of Plants and Crops	5	G		A:1	150
7	1002515	Crop Husbandry [nl] Steven Maenhout Department of Plants and Crops	5	G		A:1	150
8	1002845	Molecular Entomology	5	G		(A:2) ^d	150
9	1002675	Chemical Structure Determination Christian Stevens Department of Green Chemistry and Technology	4	W		A:1	120
10	1002510	Reaction Kinetics and Reactor Design [nl] Paul Van der Meeren Department of Green Chemistry and Technology	5	W		A:2	150
11	1002607	Resource Recovery Technology Ramon Ganigué Department of Biotechnology	6	W		A:2	180
12	1002672	Process Control Paul Van Liedekerke Department of Data Analysis and Mathematical Modelling	5	С		A:2	150
13	C004122	Capita Selecta in Bioinformatics Kathleen Marchal Department of Plant Biotechnology and Bioinformatics	3	С		A:1	75
14	1003021	Advanced Biosystems Modelling Paul Van Liedekerke Department of Data Analysis and Mathematical Modelling	5	С		A:2	150
3.3	3 Entrep	reneurship and Management					
Sul	oscribe to no	more than 12 or 14 credit units from the following list.					
Nr	Course	Ŭ	CRDT	Ref	MT1	Session	Study
1	1002720	Consumer Behaviour and Marketing of Bio-industrial products [nl] Wim Verbeke Department of Agricultural Economics	5			A:2	150
2	1001967	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 Wouter Haerick 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	1001949	Entrepreneurship [nl]
		Petra Andries Department of Marketing. Innovation and Organisation

3.4 Skills and Attitudes

Nr	Course	more than 12 of 14 credit units from the following list, with no more than 1	CRDT	Ref	erence a. MT1	Session	Study
1	1002637	Internship [en, nl] Paul Van der Meeren Department of Green Chemistry and Technology	5	а		A:J	150
2	1002638	International Internship [en, nl] Paul Van der Meeren Department of Green Chemistry and Technology	5	а		A:J	150
3	1002639	Extended Internship [en, nl] Paul Van der Meeren Department of Green Chemistry and Technology	10	а		A:J	300
4	1002640	Extended International Internship [en, nl] Paul Van der Meeren Department of Green Chemistry and Technology	10	а		A:J	300
5	1001944	Bio-ethics Michiel De Proost 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	1001784	Seminar Mieke Uyttendaele Department of Food Technology, Safety and Health	3				75
8	1002641	Laboratory Animal Science Katleen Hermans Department of Pathobiology, Pharmacology and Zoological Medicine	6			A:1	180

3

A:2

75

3.5 Open Choice

Subscribe to course units from courses offered at Ghent University and at the alliance partner VUB, including the <u>Ghent University</u> <u>Elective Courses</u>.

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	Master's Dissertation					
Nr Course		CRDT R	Ref MT1	Session	Study	
1 1001484	Master's Dissertation Marian De Mey Department of Biotechnology	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 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 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