Programme jointly offered by Ghent University,Vrije Universiteit Brussel

Master of Science in Biomedical Engineering

Language of instruction: English

Programme version 15

1 General Courses — 58 credits

The interuniversity program Master of Science in Biomedical Engineering is jointly organized with the Vrije Universiteit Brussel (VUB).
The references next to the courses indicate where the courses are organized:
• Courses marked with 'j' are jointly organized by UGent and VUB;
• Courses marked with 'p' are organized in parallel, both at UGent and at VUB;
• Courses marked with 'u' are organised by UGent;
• Courses marked with 'v' are organized by VUB.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E074300	Hospital Technology	7	j	1	A:1	210
		Sunny Eloot -- Department of Internal Medicine and Pediatrics					
2	E015590	Leadership in Health Care	3	j	1	A:1	90
		UGent - VUB, Johan Stiens -- Vrije Universiteit Brussel					
3	E010371	Medical Imaging	6	j	1	A:1	180
		Stefaan Vandenberghe -- Department of Electronics and Information Systems					
4	E092815	Hospital Project	3	p	1	B:1, A:2	90
		Alain Kalmar -- Department of Electronics and Information Systems					
5	E010382	Neuro-Engineering Science	3	u	1	A:2	90
		Pieter van Mierlo -- Department of Electronics and Information Systems					
6	E010600	Micro- and Nanotechnologies for Medical Device Design and Fabrication	5	j	1	A:2	140
		Maaike Op de Beeck -- Department of Electronics and Information Systems					
7	E027770	Data Analytics in Healthcare and Connected Care	6	p	1	A:2	180
		Sofie Van Hoecke -- Department of Electronics and Information Systems					
8	E092802	Biomedical Product Development	6	p	1	A:J	180
		Ewout Vansteenkiste -- Department of Physics and Astronomy					
9	E003280	Clinical Study Design and Biostatistics	3	u	2	A:1	90
		Barbara Vanderstraeten -- Department of Human Structure and Repair					
10	E015570	Health Information and Decision Support Systems	3	v	2	A:2	90
		Vrije Universiteit Brussel, Jef Vandemeulebroucke					
11	E027880	Introduction to Medical Device Legislation	3	u	2	A:2	90
		Patrick Segers -- Department of Electronics and Information Systems					

1.1 General Courses Biomedical Robotics and Biomaterials — 10 credits

Subscribe to 10 credit units from the following list.
The student chooses in which master's year the courses below are taken.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E063671	Biomaterials and Tissue Engineering	5	j		A:1	150
		Ruslan Dmitriev -- Department of Human Structure and Repair					
2	E010610	Biomedical Robotics and Assistive Technologies	5	v		A:1	150
		Vrije Universiteit Brussel, Joost Geeroms					

2 Elective Courses — 6 credits

Subscribe to 6 credit units from the following list. Subject to approval by the faculty.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E092923	Computational Bio-Fluid Mechanics	6	u		A:1	180
		Charlotte Debbaut -- Department of Electronics and Information Systems					

Nr	Course		CRDT	Ref	MT1	Session	Study
2	E092892	Computational Tissue and Structure Mechanics	6	u		A:1	180
		Nele Famaey -- Department of Electronics and Information Systems					
3	E010620	Computational Neurophysiology	6	j		A:1	180
		Sarah Verhulst -- Department of Information Technology					
4	E078231	Computational and Numerical Methods in Medical Physics	6	u		A:1	180
		Brent van der Heyden -- Department of Electronics and Information Systems					

3 Elective Courses — 29 credits

Subscribe to 29 credit units from no less than 1 and no more than 6 modules from the following list. Subject to approval by the faculty.
- 10 credit units in year 1
- 19 credit units in year 2

3.1 Elective Courses Biomedical Engineering

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E099300	Industry Internship Engineering and Architecture [en, nl]	6	u		A:J	180
		Patrick Segers -- Department of Electronics and Information Systems					
2	E099400	Research Internship	6	u		A:J	180
		Patrick Segers -- Department of Electronics and Information Systems					
3	E099400	Research Internship	3	u		B:J	90
		Patrick Segers -- Department of Electronics and Information Systems					
4	E092913	Modeling in Medicine and Biomedical Engineering: Case Studies	3	u		A:1	90
		Patrick Segers -- Department of Electronics and Information Systems					
5	E074500	Molecular Scale Modelling in Bio(medical) Engineering	6	u		A:1	180
		Ahmadreza Mehdipour -- Department of Applied Physics					
6	E022250	Bioelectromagnetism	4	u		C:2	120
		Wout Joseph -- Department of Information Technology					
7	E076221	Manufacturing Planning and Control	6	u		A:1	180
		Birger Raa -- Department of Industrial Systems Engineering and Product Design					
8	E075310	Ethics, Engineering and Society [nl]	3	u		A:2	90
		Seppe Segers -- Department of Philosophy and Moral Sciences					
9	E006400	Wave Physics in Living Matter	6	u		A:2	180
		Wout Joseph -- Department of Information Technology					
10	I001967	Intellectual Property and Valorization	3	u		A:2	90
		Benedikt Sas -- Department of Food Technology, Safety and Health					

3.2 Elective Courses Neuro-engineering

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E092841	Advanced Image and Signal Processing	3	u		A:1	90
		Stefaan Vandenberghe -- Department of Electronics and Information Systems					
2	E027762	Applied Magnetic Resonance Imaging Physics	3	u		A:2	90
		Pim Pullens -- Department of Electronics and Information Systems					
3	E900436	Neuro-physiological Signal Processing and Network Analysis	4	v		A:2	120
		Vrije Universiteit Brussel, Guy Nagels					
4	E092930	Translational Neuroscience	3	u		A:2	90
		Christian Vanhove -- Department of Electronics and Information Systems					
5	E092960	Neural Interfaces, Neuromodulation and Minimally Invasive Neurotechnology	3	u		A:2	90
		Vincent Keereman -- Department of Electronics and Information Systems					
6	E092970	Auditory Computation, Modelling and Devices	3	u		A:2	90
		Sarah Verhulst -- Department of Information Technology					
7	E092852	Contrast Agents and Biomarkers for Imaging and Therapy	3	u		A:1	90
		Christian Vanhove -- Department of Electronics and Information Systems					
8	E010620	Computational Neurophysiology	6	j		A:1	180
		Sarah Verhulst -- Department of Information Technology					

3.3 Elective Courses Biomechanics and Biomaterials

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E092923	Computational Bio-Fluid Mechanics	6	u		A:1	180
		Charlotte Debbaut -- Department of Electronics and Information Systems					

2	E092892	Computational Tissue and Structure Mechanics	6	u		A:1	180
		Nele Famaey -- Department of Electronics and Information Systems					
3	C003120	Physics and Chemistry of Nanostructures	6	u		B:2	180
		Zeger Hens -- Department of Chemistry					
4	D001923	Tissue Engineering	6	u		A:1	180
		Ruslan Dmitriev -- Department of Human Structure and Repair					
5	E010630	Plasma Technology for Biomedical Applications	6	u		A:1	180
		Nathalie De Geyter -- Department of Applied Physics					
6	E074500	Molecular Scale Modelling in Bio(medical) Engineering	6	u		A:1	180
		Ahmadreza Mehdipour -- Department of Applied Physics					

3.4 Elective Courses Sensors and Medical Devices

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E030761	Microphotonics	6	u		A:1	180
		Dries Van Thourhout -- Department of Information Technology					
2	E030930	Biophotonics	4	u		A:1	120
		Nicolas Le Thomas -- Department of Information Technology					
3	E008446	Sensors, Actuators and Electronic Microsystems	6	u		A:2	180
		Herbert De Smet -- Department of Electronics and Information Systems					
4	E030610	Photonics [nl]	6	u		A:2	180
		Günther Roelkens -- Department of Information Technology					
5	E900437	Micro and Nanobiotechnology	3	v		A:2	90
		Vrije Universiteit Brussel					
6	E092981	Biomedical Devices: Sensors, Stimulators and Drug Delivery	4	v		A:2	120
		Vrije Universiteit Brussel, Johan Stiens					
7	E027790	Control of Drug-Delivery Systems	4	u		A:2	120
		Clara Ionescu -- Department of Electromechanical, Systems and Metal Engineering					

3.5 Elective Courses Radiation Physics

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E027750	Measurement Techniques in Nuclear Science	3	v		A:2	90
		Vrije Universiteit Brussel, Nico Buls					
2	E025110	Nuclear Physics	3	v		A:2	90
		Vrije Universiteit Brussel, Michel Sonck					
3	E092880	Nuclear Reactors and Cyclotrons	3	v		A:1[a]	90
		Michel Sonck -- Vrije Universiteit Brussel					
4	E038110	Technology of Radiotherapy	3	u		A:1	90
		Werner De Gersem -- Department of Human Structure and Repair					
5	E027870	Medical Dosimetry	3	v		A:1	90
		Vrije Universiteit Brussel, Nico Buls					
6	E025490	Radiologic Techniques	3	u		A:1	90
		Brent van der Heyden -- Department of Electronics and Information Systems					
7	E078220	Radioprotection and Regulations [nl]	3	v		A:2	90
		Vrije Universiteit Brussel, Michel Sonck					
8	E025470	Radiochemistry [nl]	3	u		A:2	90
		Filip De Vos -- Department of Pharmaceutical Analysis					
9	E025480	Radiobiology and Radiopathology	3	u		A:2	90
		Marc Van Eijkeren -- Department of Human Structure and Repair					
10	E078231	Computational and Numerical Methods in Medical Physics	6	u		A:1	180
		Brent van der Heyden -- Department of Electronics and Information Systems					

3.6 Elective Courses Artificial Intelligence and Digital Health

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E900560	Techniques of Artificial Intelligence	6	v		A:2	180
		Vrije Universiteit Brussel					
2	E092841	Advanced Image and Signal Processing	3	u		A:1	90
		Stefaan Vandenberghe -- Department of Electronics and Information Systems					
3	E900570	Virtual Reality	5	v		A:1	150
		Vrije Universiteit Brussel					

Nr	Course		CRDT	Ref	MT1	Session	Study
4	E900580	Deep Learning	6	v		A:1	180
		Vrije Universiteit Brussel					
5	E900590	Reinforcement Learning	6	v		A:J	180
		Vrije Universiteit Brussel					
6	E900565	Statistical Foundations of Machine Learning	6	v		A:2	180
		Vrije Universiteit Brussel					
7	E061330	Machine Learning	6	u		B:1	180
		Joni Dambre -- Department of Electronics and Information Systems					
8	C003713	Introduction to Bioinformatics	3	u		A:2	90
		Kathleen Marchal -- Department of Plant Biotechnology and Bioinformatics					
9	E900550	Advanced Methods in Bioinformatics	6	v		A:2	180
		Vrije Universiteit Brussel					

3.7 Elective Courses Ghent University or VUB

Choose no more than 9 credit units from
• the programme catalogue of Ghent University, including the list with Ghent University Electives.
• the programme catalogue of VUB (partner university in this programme)
• the programme catalogue of KULeuven (as interuniversity guest student, only possible after prior approval by the Programme Board)
Subject to approval by the Programme Board/Faculty.

4 Elective Courses — 3 credits

Subscribe to no less than 3 and no more than 6 credit units from no less than 1 and no more than 2 elective modules from the following list. Subject to approval by the faculty.

4.1 Elective Course Sustainable Development Goals — 3 credits

The student chooses 3 to 6 credits from the programmes of Ghent University or VUB. Only courses that can be linked to the Sustainable Development Goals (17 SDGs), as defined by the United Nations.

4.2 Elective Courses Sustainable Development Goals: Integrated Portfolio — 3 credits

Subscribe to no less than 3 and no more than 6 credit units from the following list. Subject to approval by the faculty.

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E098010	Integrated Portfolio [en, nl]	6			A:J	180
		Hiep Luong -- Department of Telecommunications and Information Processing					
2	E098010	Integrated Portfolio [en, nl]	3			B:J	90
		Hiep Luong -- Department of Telecommunications and Information Processing					

5 Master's Dissertation — 24 credits

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E091103	Master's Dissertation	24		2	B:J	720

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