

# Study Programme

Academic year 2026-2027

Programme jointly offered by Ghent University, Vrije Universiteit Brussel Master of Science in Biomedical Engineering

Language of instruction: Dutch

Programme version 17

**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.

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

1.1 10 credits

Subscribe to 10 credit units from the following list. Subject to approval by the faculty.

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

#### **Elective Courses** 6 credits

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

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Nr	Course		CRDT	Ref	MT1	Session	Study
1	E092923	Computational Bio-Fluid Mechanics Charlotte Debbaut Department of Electronics and Information Systems	6	u		B:1	180
2	E092892	Computational Tissue and Structure Mechanics Nele Famaey Department of Electronics and Information Systems	6	u		B:1	180

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3	E010620	Computational Neurophysiology Sarah Verhulst Department of Information Technology	6	j	B:1	180
4	E078231	Computational and Numerical Methods in Medical Physics [en]	6	u	B:1	180

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.

## 3.1 Elective Courses Biomedical Engineering

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

## 3.2 Elective Courses Neuro-engineering

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

### 3.3 Elective Courses Biomechanics and Biomaterials

Nr	Course		CRDT	Ref	MT1	Session	Study
1	E092923	Computational Bio-Fluid Mechanics Charlotte Debbaut Department of Electronics and Information Systems	6	u		B:1	180
2	E092892	Computational Tissue and Structure Mechanics Nele Famaey Department of Electronics and Information Systems	6	u		B:1	180
3	C003120	Physics and Chemistry of Nanostructures [en]  Zeger Hens Department of Chemistry	6	u		B:2	180
4	D001923	Tissue Engineering [en] Ruslan Dmitriev Department of Human Structure and Repair	6	u		A:1	180

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5	E010630	Plasma Technology for Biomedical Applications [en]  Nathalie De Geyter Department of Applied Physics	6	u		A:1	180
6	E074500	Molecular Scale Modelling in Bio(medical) Engineering [en]  Ahmadreza Mehdipour Department of Applied Physics	6	u		A:1	180
3.4	4 Elective	e Courses Sensors and Medical					
Nr	Course		CRDT	Ref	MT1 :	Session	Study
1	E030761	Microphotonics [en] Dries Van Thourhout Department of Information Technology	6	u		A:1	180
2	E030930	Biophotonics [en] Nicolas Le Thomas Department of Information Technology	4	u		A:1	120
3	E008446	Sensors, Actuators and Electronic Microsystems [en] Herbert De Smet Department of Electronics and Information Systems	6	u		A:2	180
4	E030610	Photonics Günther Roelkens Department of Information Technology	6	u		A:2	180
5	E900437	Micro and Nanobiotechnology [en]  Externe lesgever Vrije Universiteit Brussel	3	V		A:2	90
6	E092981	Biomedical Devices: Sensors, Stimulators and Drug Delivery [en] Johan Stiens Vrije Universiteit Brussel	4	٧		A:2	120
7	E027790	Control of Drug-Delivery Systems [en] Clara lonescu Department of Electromechanical, Systems and Metal Engineering	4	u		A:2	120
3.5	5 Electiv	e Courses Radiation Physics					
Nr	Course		CRDT	Ref	MT1	Session	Study
1	E027750	Measurement Techniques in Nuclear Science [en] Nico Buls Vrije Universiteit Brussel	3	V		A:2	90
2	E025110	Nuclear Physics [en] Michel Sonck Vrije Universiteit Brussel	3	٧		A:2	90
3	E092880	Nuclear Reactors and Cyclotrons  Michel Sonck Vrije Universiteit Brussel	3	V			90
4	E038110	Technology of Radiotherapy [en] Werner De Gersem Department of Human Structure and Repair	3	u		A:1	90
5	E027870	Medical Dosimetry [en] Nico Buls Vrije Universiteit Brussel	3	V		A:1	90
6	E025490	Radiologic Techniques [en] Brent van der Heyden Department of Electronics and Information Systems	3	u		A:1	90
7	E078220	Radioprotection and Regulations  Michel Sonck Vrije Universiteit Brussel	3	V		A:2	90
8	E025470	Radiochemistry Filip De Vos Department of Pharmaceutical Analysis	3	u		A:2	90
9	E025480	Radiobiology and Radiopathology [en] Marc Van Eijkeren Department of Human Structure and Repair	3	u		A:2	90
10	E078231	Computational and Numerical Methods in Medical Physics [en]  Brent van der Heyden Department of Electronics and Information Systems	6	u		B:1	180
3.6	6 Elective	e Courses Artificial Intelligence and Digital Health					
Nr	Course		CRDT	Ref	MT1	Session	Study
1	E900560	Techniques of Artificial Intelligence [en]  Externe lesgever Vrije Universiteit Brussel	6	٧		A:2	180
2	E092841	Advanced Image and Signal Processing [en] Stefaan Vandenberghe Department of Electronics and Information Systems	3	u		A:1	90
3	E900570	Virtual Reality [en]  Externe lesgever Vrije Universiteit Brussel	5	V		A:1	150
4	E900580	Deep Learning [en]  Externe lesgever Vrije Universiteit Brussel	6	V		A:1	180
5	E900590	Reinforcement Learning [en]  Externe lesgever Vrije Universiteit Brussel	6	V		A:J	180
6	E900565	Statistical Foundations of Machine Learning [en] Externe lesgever Vrije Universiteit Brussel	6	V		A:2	180

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7	E061330	Machine Learning [en] Joni Dambre Department of Electronics and Information Systems	6	u	B:1	180
8	C003713	Introduction to Bioinformatics [en] Kathleen Marchal Department of Plant Biotechnology and Bioinformatics	3	u	A:2	90
9	E900550	Advanced Methods in Bioinformatics [en]  Externe lesgever Vrije Universiteit Brussel	6	V	A:2	180

#### 3.7 Elective Courses Ghent University or VUB

Subscribe to no more than 29 credit units from Elective Courses Ghent University or VUB. Subject to approval by the faculty. See <a href="https://www.ugent.be/ea/bme/en">www.ugent.be/ea/bme/en</a>

## 4 Elective Courses 3 credits

In the second master's year, the student chooses 3 to 6 credits from the programmes of Ghent University or VUB. Only courses that can be linked to the Sustainable Devolopment Goals (17 SDGs), as defined by the United Nations.

#### 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.

Νı	r 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						
Nr Course	CRDT Ref	MT1	Session	Study		
1 E091103 Master's Dissertation	24	2	A: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 2027-2028 f: annually, from 2028-2029 i: annually, from 2029-2030 b: tri-annually d: bi-annually, from 2027-2028 g: bi-annually, from 2028-2029 j: bi-annually, from 2029-2030 b: tri-annually, from 2027-2028 h: tri-annually, from 2028-2029 k: tri-annually, from 2029-2030

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