# 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 18

## 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 | B:1 | 210 |
| | | *Sunny Eloot -- Department of Internal Medicine and Pediatrics* | | | | | |
| 2 | E015590 | Leadership in Health Care | 3 | j | 1 | B:1 | 90 |
| | | *Johan Stiens -- Vrije Universiteit Brussel* | | | | | |
| 3 | E010371 | Medical Imaging | 6 | j | 1 | B:1 | 180 |
| | | *Stefaan Vandenberghe -- Department of Electronics and Information Systems* | | | | | |
| 4 | E092815 | Hospital Project | 3 | p | 1 | C:2 | 90 |
| | | *Alain Kalmar -- Department of Electronics and Information Systems* | | | | | |
| 5 | E010382 | Neuro-Engineering Science | 3 | u | 1 | B: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 | B:2 | 140 |
| | | *Maaike Op de Beeck -- Department of Electronics and Information Systems* | | | | | |
| 7 | E027770 | Data Analytics in Healthcare and Connected Care | 6 | p | 1 | B:2 | 180 |
| | | *Sofie Van Hoecke -- Department of Electronics and Information Systems* | | | | | |
| 8 | E092802 | Biomedical Product Development | 6 | p | 1 | B:J | 180 |
| | | *Ewout Vansteenkiste -- Department of Physics and Astronomy* | | | | | |
| 9 | E003280 | Clinical Study Design and Biostatistics | 3 | u | 2 | B:1 | 90 |
| | | *Barbara Vanderstraeten -- Department of Human Structure and Repair* | | | | | |
| 10 | E015571 | Clinical Decision Support Systems | 3 | v | 2 | B:2 | 90 |
| | | *Jef Vandemeulebroucke -- Vrije Universiteit Brussel* | | | | | |
| 11 | E027880 | Introduction to Medical Device Legislation | 3 | u | 2 | B:2 | 90 |
| | | *Patrick Segers -- Department of Electronics and Information Systems* | | | | | |

### 1.1 — 10 credits

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

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

## 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 | | B:1 | 180 |
| | | *Charlotte Debbaut -- Department of Electronics and Information Systems* | | | | | |
| 2 | E092892 | Computational Tissue and Structure Mechanics | 6 | u | | B:1 | 180 |
| | | *Nele Famaey -- Department of Electronics and Information Systems* | | | | | |

| Nr | Course | | CRDT | Ref | MT1 | Session | Study |
|---|---|---|---|---|---|---|---|
| 3 | E010620 | Computational Neurophysiology | 6 | j | | B:1 | 180 |
| | | *Sarah Verhulst -- Department of Information Technology* | | | | | |
| 4 | E078231 | Computational and Numerical Methods in Medical Physics [en] | 6 | u | | B: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.

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

### 3.2 Elective Courses Neuro-engineering

| Nr | Course | | CRDT | Ref | MT1 | Session | Study |
|---|---|---|---|---|---|---|---|
| 1 | E092841 | Advanced Image and Signal Processing [en] | 3 | u | | A:1 | 90 |
| | | *Stefaan Vandenberghe -- Department of Electronics and Information Systems* | | | | | |
| 2 | E027762 | Applied Magnetic Resonance Imaging Physics [en] | 3 | u | | A:2 | 90 |
| | | *Pim Pullens -- Department of Electronics and Information Systems* | | | | | |
| 3 | E900436 | Neuro-physiological Signal Processing and Network Analysis [en] | 4 | v | | A:2 | 120 |
| | | *Jeroen Van Schependom -- Vrije Universiteit Brussel* | | | | | |
| 4 | E092930 | Translational Neuroscience [en] | 3 | u | | A:2 | 90 |
| | | *Christian Vanhove -- Department of Electronics and Information Systems* | | | | | |
| 5 | E092960 | Neural Interfaces, Neuromodulation and Minimally Invasive Neurotechnology [en] | 3 | u | | A:2 | 90 |
| | | *Vincent Keereman -- Department of Electronics and Information Systems* | | | | | |
| 6 | E092970 | Auditory Computation, Modelling and Devices [en] | 3 | u | | A:2 | 90 |
| | | *Sarah Verhulst -- Department of Information Technology* | | | | | |
| 7 | E092852 | Contrast Agents and Biomarkers for Imaging and Therapy [en] | 3 | u | | A:1 | 90 |
| | | *Christian Vanhove -- Department of Electronics and Information Systems* | | | | | |
| 8 | E010620 | Computational Neurophysiology [en] | 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 | | B:1 | 180 |
| | | *Charlotte Debbaut -- Department of Electronics and Information Systems* | | | | | |
| 2 | E092892 | Computational Tissue and Structure Mechanics | 6 | u | | B:1 | 180 |
| | | *Nele Famaey -- Department of Electronics and Information Systems* | | | | | |
| 3 | C003120 | Physics and Chemistry of Nanostructures [en] | 6 | u | | B:2 | 180 |
| | | *Zeger Hens -- Department of Chemistry* | | | | | |
| 4 | D001923 | Tissue Engineering [en] | 6 | u | | A:1 | 180 |
| | | *Ruslan Dmitriev -- Department of Human Structure and Repair* | | | | | |

| 5 | E010630 | Plasma Technology for Biomedical Applications [en] | 6 | u | | A:1 | 180 |
| | | *Nathalie De Geyter -- Department of Applied Physics* | | | | | |
| 6 | E074500 | Molecular Scale Modelling in Bio(medical) Engineering [en] | 6 | u | | A:1 | 180 |
| | | *Ahmadreza Mehdipour -- Department of Applied Physics* | | | | | |

## 3.4  Elective Courses Sensors and Medical

| Nr | Course | | CRDT | Ref | MT1 | Session | Study |
|---|---|---|---|---|---|---|---|
| 1 | E030761 | Microphotonics [en] | 6 | u | | A:1 | 180 |
| | | *Dries Van Thourhout -- Department of Information Technology* | | | | | |
| 2 | E030930 | Biophotonics [en] | 4 | u | | A:1 | 120 |
| | | *Nicolas Le Thomas -- Department of Information Technology* | | | | | |
| 3 | E008446 | Sensors, Actuators and Electronic Microsystems [en] | 6 | u | | A:2 | 180 |
| | | *Herbert De Smet -- Department of Electronics and Information Systems* | | | | | |
| 4 | E030610 | Photonics | 6 | u | | A:2 | 180 |
| | | *Günther Roelkens -- Department of Information Technology* | | | | | |
| 5 | E900437 | Micro and Nanobiotechnology [en] | 3 | v | | A:2 | 90 |
| | | *Externe lesgever -- Vrije Universiteit Brussel* | | | | | |
| 6 | E092981 | Biomedical Devices: Sensors, Stimulators and Drug Delivery [en] | 4 | v | | A:2 | 120 |
| | | *Johan Stiens -- Vrije Universiteit Brussel* | | | | | |
| 7 | E027790 | Control of Drug-Delivery Systems [en] | 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 [en] | 3 | v | | A:2 | 90 |
| | | *Nico Buls -- Vrije Universiteit Brussel* | | | | | |
| 2 | E025110 | Nuclear Physics [en] | 3 | v | | A:2 | 90 |
| | | *Michel Sonck -- Vrije Universiteit Brussel* | | | | | |
| 3 | E038110 | Technology of Radiotherapy [en] | 3 | u | | A:1 | 90 |
| | | *Werner De Gersem -- Department of Human Structure and Repair* | | | | | |
| 4 | E027870 | Medical Dosimetry [en] | 3 | v | | A:1 | 90 |
| | | *Nico Buls -- Vrije Universiteit Brussel* | | | | | |
| 5 | E025490 | Radiologic Techniques [en] | 3 | u | | A:1 | 90 |
| | | *Brent van der Heyden -- Department of Electronics and Information Systems* | | | | | |
| 6 | E078220 | Radioprotection and Regulations | 3 | v | | A:2 | 90 |
| | | *Michel Sonck -- Vrije Universiteit Brussel* | | | | | |
| 7 | E025470 | Radiochemistry | 3 | u | | A:2 | 90 |
| | | *Filip De Vos -- Department of Pharmaceutical Analysis* | | | | | |
| 8 | E025480 | Radiobiology and Radiopathology [en] | 3 | u | | A:2 | 90 |
| | | *Marc Van Eijkeren -- Department of Human Structure and Repair* | | | | | |
| 9 | E078231 | Computational and Numerical Methods in Medical Physics [en] | 6 | u | | B: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 [en] | 6 | v | | A:2 | 180 |
| | | *Externe lesgever -- Vrije Universiteit Brussel* | | | | | |
| 2 | E092841 | Advanced Image and Signal Processing [en] | 3 | j | | A:1 | 90 |
| | | *Stefaan Vandenberghe -- Department of Electronics and Information Systems* | | | | | |
| 3 | E900575 | 3D Graphics in Virtual Reality [en] | 5 | v | | A:1 | 150 |
| | | *Externe lesgever -- Vrije Universiteit Brussel* | | | | | |
| 4 | E900580 | Deep Learning [en] | 6 | v | | A:1 | 180 |
| | | *Externe lesgever -- Vrije Universiteit Brussel* | | | | | |
| 5 | E900590 | Reinforcement Learning [en] | 6 | v | | A:J | 180 |
| | | *Externe lesgever -- Vrije Universiteit Brussel* | | | | | |
| 6 | E900565 | Statistical Foundations of Machine Learning [en] | 6 | v | | A:2 | 180 |
| | | *Externe lesgever -- Vrije Universiteit Brussel* | | | | | |
| 7 | E061331 | Machine Learning: Learning from Data [en] | 6 | u | | A:1 | 180 |
| | | *Joni Dambre -- Department of Electronics and Information Systems* | | | | | |

| 8 | C003713 | Introduction to Bioinformatics [en] | 3 | u | | A:2 | 90 |
|---|---|---|---|---|---|---|---|
| | | *Kathleen Marchal -- Department of Plant Biotechnology and Bioinformatics* | | | | | |
| 9 | E900550 | Advanced Methods in Bioinformatics [en] | 6 | v | | A:2 | 180 |
| | | *Externe lesgever -- Vrije Universiteit Brussel* | | | | | |

## 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 www.ugent.be/ea/bme/en

# 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 modules from the following list. Subject to approval by the faculty.
This is a compulsory section within the space for elective courses. We want our students to broaden their horizon and consciously reflect on how they can learn more about and contribute to the Sustainable Development Goals (SDGs), as defined by the United Nations.

## 4.1 Elective Course Sustainable Development Goals — 3 credits

Students can choose any course (equivalent to minimally 3 and maximally 6 credits) from any of the programmes of Ghent University or VUB which can be linked to the 17 SDGs, preferably outside the faculty of Engineering and Architecture. There is, deliberately, no list of courses to choose from, but some examples of courses that would be approved are Economic Perspectives on Health, Environmental Impact Assessment, Oceanography, Climate Change, Human rights: multidisciplinary perspectives, Global Minds, …

## 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.
Students can validate their participation in student-driven initiatives (that are recognized by the programme), directly related to WHO's SDG goals, into their curriculum. Students will create a portfolio of demonstrably acquired competencies, including a clear description of the work process. Examples of initiatives include Humasol projects (no internships), hackathons, (international) workshops, on-line courses, ... Activities require a priori approval by the programme and should have a documented, traceable and certified participation and completion.

| 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 | 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 |
| | e: tri-annually, from 2027-2028 | h: tri-annually, from 2028-2029 | k: tri-annually, from 2029-2030 |