

UGent-VUB MSc in Biomedical Engineering programme

Info for international applicants – assessing your background

Starting in academic year 2021-2022

Welcome !

First of all, thank you for the interest in our MSc in Biomedical Engineering programme! With this document, we want to provide you with some information on the background that we expect you to have and how to assess it, and some information on the structure and contents of the master programme.

Do I have the right background to be admitted to the MSc in Biomedical Engineering ?

Engineering programmes can be quite different in different institutions and it is not always trivial to tell from a course list what the exact nature of the programme is. Some programmes are practically oriented and very much hands-on, with graduates usually taking up technical jobs. Our MSc program is more of an abstract type. In our BSc programme, students acquire a profound and deep knowledge in mathematics and basic sciences (see further) and, specific for the BSc in BME, a basis in life sciences and basic biomedical engineering courses. Our focus is not so much on reproducing this knowledge, but mastering it to such a high level that knowledge can be applied in creative and innovative ways to solve new problems. Our graduates assume top positions in R&D and management of companies and hospitals, or continue in PhD and postgraduate programmes.

To get admitted, your background should sufficiently match the background of students that went through the BSc in Biomedical Engineering at Ghent University in contents and in level. Lecturers of master courses will assume that you have an equivalent background as local students, and local students will do as well when you work together on projects.

We strongly advise incoming students to take a GRE test with especially the quantitative reasoning part being a good indicator of the attained level. In our experience, a grade of 160 is a good basis to start the master programme. We do realize that a GRE test is not for free, but the cost vanishes compared to the costs that are associated with repeated failure of exams, a prolonged study duration or failure to complete the master programme.

What is my ideal background?

We're not stating that our BSc in BME is ideal, but at least it is the ideal preparation for our MSc in BME. Below, we provide a complete overview of the BSc in Biomedical Engineering at UGent, a 3 year programme of 180 credits.

	semester	year	credits	BME specific
Mathematics				33
Basis Mathematics Tools	1	1	3	
Mathematical Analysis I: Functions of One Variable	1	1	5	
Discrete Mathematics I	1	1	4	
Geometry and Linear Algebra	2	1	8	
Mathematical Analysis II: Functions of Several Variables	2	1	4	
Mathematical Analysis III: Applications of Analysis and Vector Analysis	1	2	6	
Introduction to Numerical Mathematics	2	2	3	
Physics				24
Physics I	2	1	6	
Physics II	1	2	6	
Electromagnetism I	1	3	6	yes
Medical Physics [en]	2	3	6	yes
Chemistry				12
General Chemistry	1	1	6	
Organic Chemistry	2	2	6	
Material science				20
Materials Technology: Basic Concepts and Project	2	1	5	
Statistical Physics and Molecular Structure	2	2	6	yes
Mechanics of Materials	1	3	6	
Biomedical Polymers and Processing	2	3	3	yes
Electrical engineering				12
Electrical Circuits and Networks	1	2	6	
Electronic Systems and Instrumentation for Biomedical Engineers	2	3	6	yes
Systems and signals				9
Analysis of Systems and Signals	1	3	6	
Medical Signal Processing and Statistics [en]	2	3	3	yes
Life Sciences				15
From Genome to Organism [en]	1	2	3	yes
Modelling of Physiological Systems [en]	2	2	6	yes
Quantitative Cell and Tissue Analysis [en]	1	3	6	yes
Transport and mechanics				12
Transport Phenomena	1	2	6	
Biomechanics [en]	1	3	6	yes
Programming (Python)				6
Informatics	1	1	6	
Statistics				7
Probability and Statistics	2	1	4	

Statistical Data Processing	2	2	3	
Engineering project work				18
Engineering Project I	1	1	6	
Engineering Project II	2	2	6	yes
Cross-Course Project [nl, en]	2	3	6	yes
Other engineering				12
Business Administration	2	1	3	
Modelling and Control of Dynamic Systems	2	3	6	
Elective course			3	

Background check

Please complete the table below as a self-assessment of your background.

	BSc in BME - UGent		My BSc (in BME)	
	Credits	%	Credits	%
Mathematics	33	18.3		
Physics	24	13.3		
Chemistry	12	6.7		
Material science	20	11.1		
Electrical engineering	12	6.7		
Systems and signals	9	5.0		
Life Sciences	15	8.3		
Transport and mechanics	12	6.7		
Programming (Python)	6	3.3		
Statistics	7	3.9		
Engineering project work	18	10.0		
Other engineering	12	6.7		

Preparatory programs

Students missing some background in the subjects listed above may still be admitted after taking a preparatory program. Most of the above described BSc program is taught in Dutch, but we do have 30 credits taught in English that can be included in a preparatory program. In addition, thanks to our interuniversity collaboration with VUB, we can provide the preparatory programme below:

credits	Life Sciences (21 credits)
6	Quantitative Cell and Tissue Analysis
4	From Genome to Organism
6	Modelling of Physiological Systems
6	Medical Physics
	Biomedical Engineering (18 credits)
6	Biomechanics
5	Biomaterials (VUB)
3	Bioelectronics (VUB)
3	Medical Signal Processing and Statistics
	Mathematics (15 credits)
3	Analysis-Part 1 (VUB)
3	Analysis-Part 2 (VUB)
3	Analysis-Part 3 (VUB)
3	Linear Algebra-Part 1 (VUB)
3	Linear Algebra-Part 2 (VUB)
	Engineering (3 credits)
3	System programming (VUB)

UG/VUB: courses existing at both at UGent and VUB and taught in parallel (31 credits)

VUB: courses taught solely at VUB (26 credits)

Preparatory programs will be defined on an individual basis, with courses selected from the list above.

What does the master programme look like?

We are happy and proud to be able to offer as redesigned MSc program to our students, which we believe will lead to a better training and preparation for any job in this fascinating domain.

Master		
Year	Course	Cred
1	Biomedical Product Development	6
	Artificial Organs	5
	Neuro-engineering Science	3
	Medical Imaging	6
	Micro- and Nanotechnologies for Medical Device Design	5
	Biomaterials and Tissue Engineering	5
	Computational Neurophysiology or Biomechanics	6
	Data Analytics in Biomedical Engineering	6
	Biomedical Robotics and Assistive Technologies	5
	Medical Equipment, Certification and Regulation	5
2	Hospital Project	5
	Clinical Study Design and Biostatistics	3
	Leadership in Health Care	3
1 & 2	Elective courses	30
	Master thesis	24
		120

MSc in Biomedical Engineering

(in English, collaboration with VUB; 2 years – 120 credits)

- Specialized courses in biomedical disciplines in both established and new emerging fields
- 30 credits of elective courses to shape your individual track with option to specialize in mechanics and materials, radiation physics, neuro-engineering or sensors and devices
- 41 credits project work spread over years 1 and 2

