Vue cycle du programme des cours

Ideally, students enrolling in the master program should have acquired the skills and knowledge corresponding to the 40 credits in " Biomedical " offered as part of the bachelor program in engineering.

To complete their curriculum, students must earn or validate the 60 credits of the compulsory courses (including the master thesis), 30 credits of the professionnal focus (students have to choose one of the 3 options) and 30 credits optional courses. Depending on your track record or your professional/research focus, some prerequisites/corequisites of your first year program might appear in bloc 2. You are therefore invited to go through the list of courses suggested in bloc 2 even if you enroll for the first time in this master program.

Compulsory courses from the core curriculum (B1 : 35Cr, B2 : 25Cr)

		Bl	Or	Th	Pr	Au	Cr
GBIO0029-1	*Bioelectronics* (anglais) - JeanMichel REDOUTÉ - [20h Labo., 20h Proj.]	B1	Q1	30	15	[+]	**5**
GBIO0012-2	*Biomechanics* (anglais) - Davide RUFFONI - [1j T. t.]	B1	Q1	26	26	[+]	**5**
GBIO0008-2	*Medical imaging* (anglais) - Christophe PHILLIPS - [8h Labo., 1j T. t.]	B1	Q2	33	12	[+]	**5**
GBIO0014-2	*In silico medicine* - Thomas DESAIVE	B1	Q2	30	30	-	**5**
GBIO0027-1	*Medical device design projects (Service Learning)* (anglais) - Liesbet GERIS, Davide RUFFONI - [8h Labo., 1j T. t.] **Corequis :** GBIO0026-1 - Physiologie des systèmes GBIO0025-1 - Biologie générale et cellulaire GBIO0001-1 - Biophysique et biochimie	B1	TA	30	90	[+]	**10**
GEST3162-1	*Principles of management* (anglais) - Michaël PARMENTIER, Willem STANDAERT - [25h Proj.]	B1	Q1	30	-	[+]	**5**
ATFE0016-1	*Master thesis (including introduction to research methodology)* - Davide RUFFONI - [750h Proj.]	B2	TA	-	-	[+]	**25**

Optional courses from the core curriculum (B2 : 30Cr)

Optional courses and compulsory internship
Choose 30 credits from the following list : (B2 : 30Cr)

Compulsory internship (choose between the 3 ECTS and 8 ECTS version)

ASTG0024-1	*Immersion internship* (anglais) - Liesbet GERIS	B2	TA	-	-	-	**8**
ASTG9007-1	*Observation internship* (anglais) - Liesbet GERIS	B2	TA	-	-	-	**3**

Optional courses

The thematic structuring is indicative only. You can choose amongst all the listed courses regardless of the option chosen in the professional focus.

The subjects GBIO0001-1, GBIO0025-1 et GBIO0026-1 are corequisite to some compulsory courses of the master program. They must be taken as a priority, unless they were already taken as part of the bachelor in engineering, or unless the corresponding knowledge and skills have been acquired previously.

Biomedical engineering & sciences

GBIO0001-1	*Biophysique et biochimie* - Mireille DUMOULIN, Liesbet GERIS - [6h Proj.]	B2	Q1	29	23	[+]	**5**
GBIO0016-1	*Introduction to systems and synthetic biology* (anglais) - Frank DELVIGNE	B2	Q2	26	26	-	**5**
GBIO0022-1	*Biomimicry* (anglais) - Philippe COMPÈRE, Tristan GILET, Davide RUFFONI - [45h Proj.]	B2	TA	15	-	[+]	**5**
GBIO0025-1	*Biologie générale et cellulaire* - Christel PEQUEUX	B2	Q2	36	10	-	**5**
GBIO0026-1	*Physiologie des systèmes* - Philippe KOLH	B2	Q2	26	26	-	**5**
LABO0432-3	*Techniques de culture de cellules et de tissus* - Erik MAQUOI, MarieJulie NOKIN	B2	Q2	8	20	-	**2**

Biomechanics, Biomaterials & Tissues Engineering

CHIM9319-1	*Chemistry and technology of polymers* (anglais) - Antoine DEBUIGNE, Klaus KECKANTOINE - [10h Proj., 12h Labo.]	B2	Q2	30	-	[+]	**5**
MECA0018-2	*Manufacturing processes* (anglais) - Yves MARCHAL - [15h Labo., 11h Proj., 0,5j T. t.]	B2	Q2	30	-	[+]	**5**
MECA0462-2	*Materials selection* (anglais) - Anne MERTENS, Davide RUFFONI - [30h Proj., 1j T. t.]	B2	Q1	26	26	[+]	**5**
MECA0516-1	*Mechanical properties of biological and bioinspired materials* (anglais) - Davide RUFFONI - [4h Labo.]	B2	Q1	26	22	[+]	**5**

In silico medicine

BIOL0021-1	*Biologie des systèmes* - Patrick MEYER - [10h TD]	B2	Q1	10	-	[+]	**2**
ELEN0016-2	*Computer vision* (anglais) - Anthony CIOPPA, Adrien DELIÈGE, Marc VAN DROOGENBROECK - [50h Proj.]	B2	Q1	30	10	[+]	**5**
GBIO0015-1	*A tour in genetic epidemiology* (anglais) - Kristel VAN STEEN - [60h Proj.]	B2	Q2	15	15	[+]	**3**
MATH0024-1	*Modelling with partial differential equations* (anglais) - Maarten ARNST, Romain BOMAN - [25h Proj.]	B2	Q1	30	20	[+]	**5**
MECA0010-1	*Uncertainty quantification and stochastic modeling* (anglais) - Maarten ARNST - [28h Proj.]	B2	Q1	16	16	[+]	**5**

Neural systems

ELEN0448-1	*Applied Electricity and Electronics* (anglais) - JeanMichel REDOUTÉ, Philippe VANDERBEMDEN	B2	Q1	26	26	-	**5**
ELEN0037-1	*Microelectronics and IC design* (anglais) - JeanMichel REDOUTÉ - [40h Proj.]	B2	Q2	30	20	[+]	**5**
GNEU0002-1	*Brain Inspired Computing* (anglais) - Alessio FRANCI - [20h Proj.]	B2	Q2	25	20	[+]	**5**
GNEU0003-1	*Neuromorphic Signal Processing* (anglais) - Alessio FRANCI - [20h Proj.]	B2	Q2	25	20	[+]	**5**
GNEU0004-1	*Computational cognitive modelling* (anglais) - Alessio FRANCI	B2	Q1	26	26	-	**5**
GBIO0036-1	*Experimental Neurophysiology for Engineers* (anglais) - [15h Proj.]	B2	Q1	20	20	[+]	**5**

Other optional courses

PROJ0011-2	*Personal student project* (anglais) - Liesbet GERIS, Grégoire LÉONARD - [150h Proj.]	B2	TA	-	-	[+]	**5**
SYST0020-1	*Introduction to microsystems and microtechnology* (anglais) - Tristan GILET, JeanMichel REDOUTÉ - [4h Labo., 20h Proj.]	B2	Q2	24	18	[+]	**5**
ELEN0449-1	*Computer Vision understanding* (anglais) - Anthony CIOPPA - [50h Proj.]	B2	Q2	24	10	[+]	**5**
MATH0461-2	*Introduction to numerical optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	B2	Q1	30	20	[+]	**5**
MATH0462-1	*Discrete optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	B2	Q2	30	20	[+]	**5**
MECA0031-2	*Kinematics and dynamics of mechanisms* (anglais) - Olivier BRULS - [40h Proj.]	B2	Q2	30	20	[+]	**5**
MECA0473-1	*Ingénierie des matériaux métalliques* - Anne MERTENS	B2	Q1	26	26	-	**5**
PHYS0904-4	*Physique des matériaux* - Luc COURARD, Anne MERTENS - [1j T. t.]	B2	Q2	26	26	[+]	**5**

[...] Or choose a maximum of 30 credits from the following list :

ELEN0062-1	*Introduction to machine learning* (anglais) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B2	Q1	30	5	[+]	**5**

ELEN0074-1	*Sensors, microsensors and instrumentation* (anglais) - Philippe VANDERBEMDEN - [20h Labo.]	B2	Q2	30	-	[+]	**5**
GNEU0001-1	*Principles of Neuroengineering* (anglais) - Guillaume DRION, Alessio FRANCI, Christophe PHILLIPS, Pierre SACRÉ - [26h Labo., 15h Proj.]	B2	Q1	26	-	[+]	**5**
PHYS0128-1	*Magnetic Resonance Imaging - the Basics* (anglais) - Laurent LAMALLE - [3j T. t.]	B2	Q2	15	-	[+]	**3**
GBIO0034-1	*Neuroimaging data analysis* (anglais) - Christophe PHILLIPS	B2	Q1	10	5	-	**2**
SYST0017-1	*Neurodynamics* (anglais) - Pierre DAUBY, Guillaume DRION	B2	Q1	26	26	-	**5**
SYST0022-1	*Linear Systems Design* (anglais) - Guillaume DRION, Pierre SACRÉ - [15h Proj.]	B2	Q2	26	26	[+]	**5**
GBIO0033-1	*Advances in in silico medicine* (anglais) - Liesbet GERIS	B2	Q1	26	26	-	**5**
MECA0036-2	*Finite Element Method* (anglais) - JeanPhilippe PONTHOT - [40h Proj.]	B2	Q2	26	26	[+]	**5**
INFO0939-1	*High performance scientific computing* (anglais) - Christophe GEUZAINE - [20h Proj.]	B2	Q1	30	15	[+]	**5**
INFO8010-1	*Deep learning* (anglais) - Gilles LOUPPE - [60h Proj.]	B2	Q2	30	-	[+]	**5**
GBIO0018-2	*Introduction to tissue engineering* (anglais) - Liesbet GERIS	B2	Q2	20	5	-	**4**
MECA0008-1	*Microfluidics* (anglais) - Tristan GILET - [16h Labo., 14h Proj.]	B2	Q2	22	8	[+]	**5**
MECA0139-1	*Additive manufacturing and 3D printing* (anglais) - Anne MERTENS	-	Q1	26	26	-	**5**
PROT0430-3	*Biomedical robotics and active prostheses* (anglais) - Olivier BRULS	B2	Q1	15	10	-	**3**
BIOC0430-1	*Interactions materials - living systems* (anglais) - Dorien VAN HEDE	B2	Q1	25	-	-	**3**
BIOM0631-1	*Human movement analysis* (anglais) - Olivier BRULS, Cédric SCHWARTZ - [15h Proj.]	B2	Q1	33	14	[+]	**5**

[...] With the agreement of the jury, choose 5 credits in any course programme of the University or from the UNIC course catalog.

Focus courses (B1 : 25Cr, B2 : 5Cr)

Choose one of the following options (25 credits during B1 and 5 credits during B2) : (B1 : 25Cr, B2 : 5Cr)

Biomechanics, Biomaterials & Tissues Engineering (B1 : 25Cr, B2 : 5Cr)

BIOC0430-1	*Interactions materials - living systems* (anglais) - Dorien VAN HEDE	B1	Q1	25	-	-	**3**
MECA0139-1	*Additive manufacturing and 3D printing* (anglais) - Anne MERTENS	B1	Q1	26	26	-	**5**
PROT0430-3	*Biomedical robotics and active prostheses* (anglais) - Olivier BRULS	B1	Q1	15	10	-	**3**
GBIO0018-2	*Introduction to tissue engineering* (anglais) - Liesbet GERIS	B1	Q2	20	5	-	**4**
MECA0008-1	*Microfluidics* (anglais) - Tristan GILET - [16h Labo., 14h Proj.]	B1	Q2	22	8	[+]	**5**
MECA0036-2	*Finite Element Method* (anglais) - JeanPhilippe PONTHOT - [40h Proj.]	B1	Q2	26	26	[+]	**5**
BIOM0631-1	*Human movement analysis* (anglais) - Olivier BRULS, Cédric SCHWARTZ - [15h Proj.]	B2	Q1	33	14	[+]	**5**

In silico medicine (B1 : 25Cr, B2 : 5Cr)

ELEN0062-1	*Introduction to machine learning* (anglais) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B1	Q1	30	5	[+]	**5**
INFO0939-1	*High performance scientific computing* (anglais) - Christophe GEUZAINE - [20h Proj.]	B1	Q1	30	15	[+]	**5**

MECA0036-2	*Finite Element Method* (anglais) - JeanPhilippe PONTHOT - [40h Proj.]	B1	Q2	26	26	[+]	**5**
INFO8010-1	*Deep learning* (anglais) - Gilles LOUPPE - [60h Proj.]	B1	Q2	30	-	[+]	**5**
SYST0022-1	*Linear Systems Design* (anglais) - Guillaume DRION, Pierre SACRÉ - [15h Proj.]	B1	Q2	26	26	[+]	**5**
GBIO0033-1	*Advances in in silico medicine* (anglais) - Liesbet GERIS	B2	Q1	26	26	-	**5**
Neural systems (B1 : 25Cr, B2 : 5Cr)							
GNEU0001-1	*Principles of Neuroengineering* (anglais) - Guillaume DRION, Alessio FRANCI, Christophe PHILLIPS, Pierre SACRÉ - [26h Labo., 15h Proj.]	B1	Q1	26	-	[+]	**5**
ELEN0074-1	*Sensors, microsensors and instrumentation* (anglais) - Philippe VANDERBEMDEN - [20h Labo.]	B1	Q2	30	-	[+]	**5**
SYST0022-1	*Linear Systems Design* (anglais) - Guillaume DRION, Pierre SACRÉ - [15h Proj.]	B1	Q2	26	26	[+]	**5**
SYST0017-1	*Neurodynamics* (anglais) - Pierre DAUBY, Guillaume DRION	B1	Q1	26	26	-	**5**
PHYS0128-1	*Magnetic Resonance Imaging - the Basics* (anglais) - Laurent LAMALLE - [3j T. t.]	B1	Q2	15	-	[+]	**3**
GBIO0034-1	*Neuroimaging data analysis* (anglais) - Christophe PHILLIPS	B1	Q1	10	5	-	**2**
GBIO0035-1	*Advanced Magnetic Resonance Imaging* (anglais)	B2	Q1	-	-	-	**5**

Crédits supplémentaires Master ingénieur civil biomédical

Optional courses (B0 : 60Cr)

The program of each candidate will be determined by the Jury according to his previous training. If a candidate does not master certain prerequisites, his program may include up to 60 credits of additional courses mainly from the list below : For holders of a master's degree in industrial sciences or a master's degree in industrial engineering sciences (all specializations), the volume of the supplementary program may be reduced to 15 credits. (B0 : 60Cr)

GBIO0025-1	*Biologie générale et cellulaire* - Christel PEQUEUX	B0	Q2	36	10	-	**5**
GBIO0026-1	*Physiologie des systèmes* - Philippe KOLH	B0	Q2	26	26	-	**5**
GBIO0002-1	*Genetics and bioinformatics* (anglais) - Franck DEQUIEDT, Kristel VAN STEEN - [15h Proj.]	B0	Q1	30	15	[+]	**5**
GBIO0011-1	*Modélisation des systèmes biologiques* - Pierre DAUBY, Liesbet GERIS	B0	Q2	26	26	-	**5**
GBIO0001-1	*Biophysique et biochimie* - Mireille DUMOULIN, Liesbet GERIS - [6h Proj.]	B0	Q1	29	23	[+]	**5**
GBIO0021-1	*Projet de laboratoire* - Thomas DESAIVE, Liesbet GERIS - [16h Labo., 8h Proj.]	B0	Q2	-	44	[+]	**5**
GBIO0013-1	*Phénomènes de transport en biologie* - Dominique TOYE - [25h Proj.]	B0	Q2	26	26	[+]	**5**
GBIO0005-1	*Introduction aux neurosciences cognitives* - Gilles VANDEWALLE	B0	Q1	26	26	-	**5**