

Vue cycle du programme des cours

B1 Or Th Pr Au Cr

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.

To complete their curriculum, students must earn or validate the 55 credits of the compulsory courses (including the master thesis), 30 credits technical training and 35 credits optional courses (30 of which counts towards the professional focus). 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.

Compulsory courses (B1 : 30Cr, B2 : 25Cr)

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|--|---|----|----|----|----|-----|----|
| GBIO0029-1 | <i>Bioelectronics</i> (anglais) - JeanMichel REDOUTÉ - [20h Labo., 20h Proj.] | B1 | Q1 | 30 | 15 | [+] | 5 |
| GBIO0012-2 | <i>Biomechanics</i> (anglais) - Davide RUFFONI - [1j T. t.] | B1 | Q1 | 26 | 26 | [+] | 5 |
| GBIO0008-2 | <i>Medical imaging</i> (anglais) - Christophe PHILLIPS - [8h Labo., 1j T. t.] | B1 | Q2 | 33 | 12 | [+] | 5 |
| GBIO0027-1 | <i>Integrated project in biomedical engineering</i> (anglais) - Liesbet GERIS, Davide RUFFONI | B1 | TA | 30 | 90 | - | 10 |
| Corequis : | | | | | | | |
| GBIO0001-1 - Biophysique et biochimie | | | | | | | |
| GBIO0025-1 - Biologie générale et cellulaire | | | | | | | |
| GBIO0026-1 - Physiologie des systèmes | | | | | | | |
| GEST3162-1 | <i>Principles of management</i> (anglais) - Michael GHILISSEN, François PICHHAULT | B1 | Q1 | 25 | 25 | - | 5 |
| ATFE0016-1 | <i>Master thesis (including introduction to research methodology)</i> - Davide RUFFONI - [750h Proj.] | B2 | TA | - | - | [+] | 25 |

Optional courses (B1 : 30Cr, B2 : 35Cr)

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

Electronics (B1 : 25Cr, B2 : 5Cr)

Choose 30 credits in the following list : (B1 : 25Cr, B2 : 5Cr)

[...] [b]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.[/b]

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|------------|--|---|----|----|----|-----|---|
| SYST0017-1 | <i>Advanced topics in systems and control</i> (anglais) - Guillaume DRION | - | Q1 | 26 | 26 | - | 5 |
| ELEN0016-2 | <i>Computer vision</i> (anglais) - Marc VAN DROOGENBROECK - [50h Proj.] | - | Q1 | 30 | 10 | [+] | 5 |
| SYST0003-1 | <i>Linear control systems</i> (anglais) - Partim A - Guillaume DRION - Partim C - Guillaume DRION - [6h Labo.] | - | Q1 | 26 | 6 | - | 5 |
| ELEN0074-1 | <i>Sensors, microsensors and instrumentation</i> (anglais) - Philippe VANDERBEMDEN - [20h Labo.] | - | Q2 | 30 | - | [+] | 5 |
| ELEN0037-1 | <i>Microelectronics and IC design</i> (anglais) - JeanMichel REDOUTÉ - [40h Proj.] | - | Q2 | 30 | 20 | [+] | 5 |
| ELEN0071-1 | <i>Applied digital signal processing</i> (anglais) - Pierre SACRÉ - [40h Proj.] | - | Q2 | 39 | 13 | [+] | 5 |

Informatics (B1 : 25Cr, B2 : 5Cr)

Choose 30 credits in the following list : (B1 : 25Cr, B2 : 5Cr)

[...] [b]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.[/b]

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|------------|--|---|----|----|----|-----|--|----------|
| SYST0003-1 | <i>Linear control systems</i> (anglais) - Partim A - Guillaume DRION - Partim C - Guillaume DRION - [6h Labo.] | - | Q1 | 26 | 6 | - | | 5 |
| INFO0939-1 | <i>High performance scientific computing</i> (anglais) - Christophe GEUZAIN - [20h Proj.] | - | Q1 | 30 | 15 | [+] | | 5 |
| MATH0462-1 | <i>Discrete optimization</i> (anglais) - Quentin LOUVEAUX - [25h Proj.] | - | Q1 | 30 | 20 | [+] | | 5 |
| ELEN0060-2 | <i>Information and coding theory</i> (anglais) - Louis WEHENKEL - [30h Proj.] | - | Q2 | 30 | 15 | [+] | | 5 |
| ELEN0062-1 | <i>Introduction to machine learning</i> (anglais) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.] | - | Q1 | 30 | 5 | [+] | | 5 |
| ELEN0071-1 | <i>Applied digital signal processing</i> (anglais) - Pierre SACRÉ - [40h Proj.] | - | Q2 | 39 | 13 | [+] | | 5 |

Mechanics (B1 : 25Cr, B2 : 5Cr)

Choose 30 credits in the following list : (B1 : 25Cr, B2 : 5Cr)

[...] [b]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.[/b]

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|------------|--|---|----|----|----|-----|--|----------|
| MECA0036-2 | <i>Finite Element Method</i> (anglais) - JeanPhilippe PONTHOT - [40h Proj.] | - | Q2 | 26 | 26 | [+] | | 5 |
| MECA0031-2 | <i>Kinematics and dynamics of mechanisms</i> (anglais) - Olivier BRULS - [40h Proj.] | - | Q2 | 30 | 20 | [+] | | 5 |
| MECA0008-1 | <i>Microfluidics</i> (anglais) - Tristan GILET - [16h Labo., 14h Proj.] | - | Q2 | 22 | 8 | [+] | | 5 |
| MECA0010-1 | <i>Reliability and stochastic modeling of engineering systems</i> (anglais) - Maarten ARNST - [28h Proj.] | - | Q1 | 16 | 16 | [+] | | 5 |
| MECA0462-2 | <i>Materials selection</i> (anglais) - Anne MERTENS, Davide RUFFONI - [30h Proj., 1j T. t.] | - | Q1 | 26 | 26 | [+] | | 5 |
| MECA0139-1 | <i>Techniques de fabrication additive et 3D printing</i> - Thierry DORMAL, Anne MERTENS | - | Q1 | 26 | 26 | - | | 5 |

Chemistry/Materials (B1 : 25Cr, B2 : 5Cr)

Choose 30 credits in the following list : (B1 : 25Cr, B2 : 5Cr)

[...] [b]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.[/b]

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|------------|---|---|----|----|----|-----|--|----------|
| CHIM0072-2 | <i>Ingénierie des nanomatériaux et des matériaux divisés</i> - Benoit HEINRICHS, Stéphanie LAMBERT | - | Q1 | 15 | 15 | - | | 3 |
| CHIM0604-2 | <i>Chimie et matériaux organiques</i> - Lionel DELAUDE | - | Q2 | 33 | 19 | - | | 5 |
| CHIM0675-1 | <i>Chimie macromoléculaire</i> - AnneSophie DUWEZ - [20h Labo.] Corequis : CHIM0604-2 - Chimie et matériaux organiques | - | Q1 | 20 | - | [+] | | 3 |
| CHIM9277-1 | <i>Génie chimique (étude des réacteurs)</i> - Dominique TOYE - [15h Labo.] | - | Q1 | 45 | 15 | [+] | | 4 |
| MECA0462-2 | <i>Materials selection</i> (anglais) - Anne MERTENS, Davide RUFFONI - [30h Proj., 1j T. t.] | - | Q1 | 26 | 26 | [+] | | 5 |
| CHIM9302-1 | <i>Question avancée de génie chimique : Biotechnologie</i> - Frank DELVIGNE, Aurore RICHEL, Dominique TOYE - [30h Proj., | - | Q1 | 30 | 10 | [+] | | 5 |

[1j T. t.]

PHYS0904-4 *Physique des matériaux* - Anne MERTENS - [1j T. t.] - Q2 26 26 [+] 5

Basics in bioengineering

GBIO0001-1 *Biophysique et biochimie* - Paulette CHARLIER, Liesbet GERIS - [6h Proj.] B1 Q1 29 23 [+] 5

GBIO0025-1 *Biologie générale et cellulaire* - Olivier PEULEN B1 Q2 26 26 - 5

GBIO0026-1 *Physiologie des systèmes* - Philippe KOLH B1 Q2 26 26 - 5

Choose 5 credits : (B1 : 5Cr)

[...] The remaining credits (5 ECTS) can be chosen in amongst the optional or technical courses that have not yet been followed

Single focus (B2 : 30Cr)

Professional focus (B2 : 30Cr)

Choose 30 credits from the following list. The thematic structuring is indicative only. (B2 : 30Cr)

[...] Technical courses that have not yet been followed can also be chosen as optional courses.

Compulsory internship (One of the internship courses has to be chosen, but they are mutually exclusive.)

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

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

Imaging and instrumentation

MATH0049-1 *Caractérisation morphologique de systèmes désordonnés* - Silvia BLACHER B2 Q1 26 26 - 5

ELEN0071-1 *Applied digital signal processing (anglais)* - Pierre SACRÉ - [40h Proj.] B2 Q2 39 13 [+] 5

ELEN0004-1 *Semiconductor devices (anglais)* - Benoît VANDERHEYDEN B2 Q1 26 26 - 5

MATH0461-2 *Introduction to numerical optimization (anglais)* - Quentin LOUVEAUX - [25h Proj.] B2 Q1 30 20 [+] 5

ELEC0017-1 *Electromagnetic Compatibility (anglais)* - Véronique BEAUVOIS, Christophe GEUZAINÉ - [30h Proj.] B2 TA 20 10 [+] 5

PHYS0128-1 *Bases de l'imagerie par résonance magnétique nucléaire (anglais)* - Evelyne BALTEAU - [3j T. t.] B2 Q1 15 - [+] 3

ELEC0041-1 *Modelling and design of electromagnetic systems (anglais)* - Christophe GEUZAINÉ B2 Q2 26 26 - 5

ELEC0054-1 *Application of electrical measurement systems (anglais)* - Philippe VANDERBEMDEN - [20h Labo.] B2 Q1 30 10 [+] 5

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

STAT0722-1 *Introduction à la statistique médicale (anglais)* - Christophe PHILLIPS B2 Q1 10 5 - 2

INFO0009-2 *Bases de données (organisation générale)* - Pierre WOLPER - Suppl : Samuel HIARD - [25h Proj.] B2 Q2 26 26 [+] 5

INFO0064-2 *Embedded systems (anglais)* - Bernard BOIGELOT B2 Q1 25 20 - 3

SYST0020-1 *Introduction to microsystems and microtechnology (anglais)* - Tristan GILET, JeanMichel REDOUTÉ - [4h Labo., 20h Proj.] B2 Q2 24 18 [+] 5

INFO2055-1 *Embedded systems project (anglais)* - Bernard BOIGELOT - [60h Proj.] B2 Q2 - - [+] 2

Mechanics, materials and chemistry

| | | | | | | | |
|------------|---|----|----|----|----|-----|----------|
| PROT0430-3 | <i>Biomedical robotics and active prostheses</i> (anglais) - Olivier BRULS | B2 | Q1 | 15 | 10 | - | 3 |
| MECA0516-1 | <i>Mechanical properties of biological and bioinspired materials</i> (anglais) - Partim A - Davide RUFFONI - Partim B - Davide RUFFONI - [3h Labo.] | B2 | Q1 | 15 | 12 | - | 3 |
| CHIM0625-1 | <i>Mécanique et dynamique moléculaire</i> - Frédéric KERFF | B2 | Q1 | 10 | 10 | - | 2 |
| MECA0464-1 | <i>Large deformation of solids</i> (anglais) - JeanPhilippe PONTHOT - [60h Proj.] | B2 | Q1 | 26 | 26 | [+] | 5 |
| MECA0446-2 | <i>Continuum Mechanics</i> (anglais) - JeanPhilippe PONTHOT - [50h Proj.] | B2 | Q2 | 26 | 26 | [+] | 5 |
| MECA0025-3 | <i>Mécanique des fluides</i> - Eric DELHEZ - [30h Proj.] | B2 | Q2 | 26 | 26 | [+] | 5 |
| MECA0018-2 | <i>Manufacturing processes</i> (anglais) - Yves MARCHAL - [15h Labo., 11h Proj., 0,5j T. t.] | B2 | Q2 | 30 | - | [+] | 5 |
| CHIM0698-1 | <i>Physical chemistry of interfaces</i> (anglais) - Cédric GOMMES | B2 | Q2 | 20 | 10 | - | 3 |
| PHYS0038-2 | <i>Introduction into polymer physics including plasturgy</i> - Klaus KECKANTOINE | B2 | Q1 | 30 | - | - | 4 |
| CHIM0666-2 | <i>Matériaux inorganiques: procédés de fabrication et propriétés d'usage</i> - Stéphanie LAMBERT - [30h Labo., 1j T. t.] | B2 | Q2 | 30 | - | [+] | 5 |
| CHIM0676-1 | <i>Polymerisation processes</i> (anglais) - Klaus KECKANTOINE | B2 | Q2 | 20 | - | - | 2 |
| BIOL0114-3 | <i>Microscopies électroniques</i> - Partim A - Philippe COMPÈRE - Partim B - Philippe COMPÈRE | B2 | Q2 | 15 | - | - | 5 |
| CHIM0668-1 | <i>Agitation et mélange</i> - Dominique TOYE - [5h Labo.] | B2 | Q1 | 20 | 5 | [+] | 3 |
| MECA0473-1 | <i>Ingénierie des matériaux métalliques</i> - Anne MERTENS | B2 | Q1 | 26 | 26 | - | 5 |
| CHIM0697-1 | <i>Heterogeneous catalysis</i> (anglais) - Nathalie JOB - [10h Proj.] | B2 | Q2 | 20 | 20 | [+] | 4 |
| MECA0012-6 | <i>Mécanique des solides</i> - Laurent DUCHENE - [15h Proj.] | B2 | Q2 | 26 | 26 | [+] | 5 |
| MECA0023-1 | <i>Advanced solid mechanics</i> (anglais) - JeanPhilippe PONTHOT - [30h Proj.] | B2 | Q1 | 26 | 26 | [+] | 5 |

Modeling and informatics

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|------------|--|----|----|----|----|-----|----------|
| GBIO0017-1 | <i>Identification paramétrique de modèles biologiques</i> - Dominique TOYE | B2 | Q1 | 10 | 10 | - | 2 |
| GBIO0014-2 | <i>Modélisation des systèmes physiologiques et applications cliniques</i> - Thomas DESAIVE | B2 | Q1 | 30 | 30 | - | 4 |
| GBIO0015-1 | <i>A tour in genetic epidemiology</i> (anglais) - Kristel VAN STEEN - [60h Proj.] | B2 | Q2 | 15 | 15 | [+] | 3 |
| BIOC0718-2 | <i>Relations structure-fonction dans les biomolécules</i> - Mireille DUMOULIN | B2 | Q2 | 15 | 25 | - | 4 |
| GBIO0007-1 | <i>Analyse des séquences des gènes et des protéines : partim a</i> - Bernard JORIS | B2 | Q1 | 10 | 10 | - | 2 |
| GBIO0030-1 | <i>Computational approaches to statistical genetics</i> (anglais) - Kristel VAN STEEN - [35h Proj.] | B2 | Q2 | 25 | 15 | [+] | 5 |
| MATH0024-1 | <i>Modelling with partial differential equations</i> (anglais) - Maarten ARNST, Romain BOMAN - [25h Proj.] | B2 | Q1 | 30 | 20 | [+] | 5 |
| INFO0939-1 | <i>High performance scientific computing</i> (anglais) - Christophe GEUZAINÉ - [20h Proj.] | B2 | Q1 | 30 | 15 | [+] | 5 |

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|-------------------------------|--|----|----|----|----|-----|---|
| MECA0036-2 | <i>Finite Element Method</i> (anglais) - JeanPhilippe PONTHOT - [40h Proj.] | B2 | Q2 | 26 | 26 | [+] | 5 |
| MATH0461-2 | <i>Introduction to numerical optimization</i> (anglais) - Quentin LOUVEAUX - [25h Proj.] | B2 | Q1 | 30 | 20 | [+] | 5 |
| MATH0471-2 | <i>Multiphysics integrated computational project</i> (anglais) - Romain BOMAN, Christophe GEUZAIN - [30h Proj.] | B2 | TA | 33 | - | [+] | 5 |
| INFO0009-2 | <i>Bases de données (organisation générale)</i> - Pierre WOLPER - Suppl : Samuel HIARD - [25h Proj.] | B2 | Q2 | 26 | 26 | [+] | 5 |
| ELEN0060-2 | <i>Information and coding theory</i> (anglais) - Louis WEHENKEL - [30h Proj.] | B2 | Q2 | 30 | 15 | [+] | 5 |
| GBIO0031-1 | <i>Learning from genomic data</i> (anglais) - Kristel VAN STEEN - [150h Proj.] | B2 | Q2 | - | - | [+] | 5 |
| INFO0064-2 | <i>Embedded systems</i> (anglais) - Bernard BOIGELOT | B2 | Q1 | 25 | 20 | - | 3 |
| Biomedical engineering | | | | | | | |
| GBIO0018-2 | <i>Introduction to tissue engineering</i> (anglais) - Liesbet GERIS - [15h Proj.] | B2 | Q2 | 20 | 5 | [+] | 3 |
| BIOC0430-1 | <i>Interaction matériau - vivant</i> - Christian GRANDFILS | B2 | Q1 | 25 | - | - | 3 |
| GBIO0022-1 | <i>Biomimeticism</i> (anglais) - Philippe COMPÈRE, Liesbet GERIS, Tristan GILET, Davide RUFFONI - [45h Proj.] | B2 | TA | 15 | - | [+] | 5 |
| INGE0012-1 | <i>Scientific research in engineering and its impact on innovation</i> (anglais) - Rodolphe SEPULCHRE | B2 | Q2 | 26 | 26 | - | 5 |
| BIOM0631-1 | <i>Human movement analysis</i> (anglais) - Olivier BRULS, Cédric SCHWARTZ - [15h Proj.] | B2 | Q1 | 33 | 14 | [+] | 5 |
| GBIO0016-1 | <i>Introduction to systems and synthetic biology</i> (anglais) - Frank DELVIGNE, Philippe JACQUES, Bernard JORIS | B2 | Q2 | 26 | 26 | - | 5 |
| CHIM9231-1 | <i>Characterisation of Biomaterials</i> (anglais) - Virginie BERTRAND, AnneSophie DUWEZ, Gauthier EPPE | B2 | Q1 | 15 | 15 | - | 3 |
| LABO0432-1 | <i>Techniques de culture de cellules et de tissus</i> - Julie LECOMTE, Erik MAQUOI | B2 | Q1 | 8 | 20 | - | 2 |
| SBIM0495-1 | <i>Molecular and cellular basis of disease</i> (anglais) - Vincent SEUTIN - [10h TD, 40h RP] | B2 | Q1 | 20 | - | [+] | 7 |
| PROJ0011-2 | <i>Personal student project</i> (anglais) - Georges DE PELSEMAEKER, Pierre DUYSINX, Liesbet GERIS, Grégoire LÉONARD, Quentin LOUVEAUX - [150h Proj.] | B2 | TA | - | - | [+] | 5 |
| GEST0188-1 | (pas organisé en 2018-2019) <i>Obtention et reconnaissance de la qualité et de la conformité</i> - Pierre DEWALLEF | B2 | Q1 | 30 | - | - | 3 |
| MECA0521-1 | (pas organisé en 2018-2019) <i>Gestion QSHE, Partim 2 : Aspects pratiques de la gestion QHSE</i> - Pierre DEWALLEF - [10h Proj., 1j T. t.] | B2 | TA | 20 | 10 | [+] | 2 |

Crédits supplémentaires Master ingénieur civil biomédical

Cours au choix (B0 : 60Cr)

Le programme de chaque étudiant sera déterminé par le jury en fonction de sa formation antérieure. Si un candidat à l'admission ne maîtrise pas certains prérequis, son programme pourra comporter jusqu'à 60 crédits de cours supplémentaires essentiellement issus de la liste ci-dessous : (B0 : 60Cr)

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

[...] A cette liste pourront s'ajouter, dans la limite des 60 crédits, d'autres cours techniques en fonction des compétences acquises par l'étudiant.