

## Block view of the study programme

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### Bloc 1 du programme de l'année

#### Compulsory Courses

GBIO0029-1	<i>Bioelectronics</i> (english language) - Michael KRAFT - [20h Labo., 20h Proj.]	Q1	30	15	[+]	5
GBIO0012-2	<i>Biomechanics</i> (english language) - Davide RUFFONI - [1d FW]	Q1	30	30	[+]	5
GBIO0008-2	<i>Medical imaging</i> (english language) - Christophe PHILLIPS - [8h Labo., 1d FW]	Q2	33	12	[+]	5
GBIO0027-1	<i>Integrated project in biomedical engineering</i> (english language) - Liesbet GERIS, Davide RUFFONI	TA	30	90	-	10

*Notice* : with the consent of the President of the jury, notably according to technical matter, the integrated project can be in line with an interdisciplinary project (for example Ingénieur de projets, Eurobot, Eco-Shell Marathon,...), carried out between the third year of the bachelor and the second year of the master

GEST3162-1	<i>Principles of management</i> (english language) - Michael GHILISSEN, François PICHAULT, Thierry PIRONET, Didier VAN CAILLIE	Q1	25	25	-	5
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*Notice* : in bloc 1 and bloc 2 together, students choose 30 ECTS technical formation and 30 ECTS research focus. In bloc 1 students choose at least 20 ECTS of technical formation and maximum 10 ECTS of research focus. Exceptions are possible with the accord of the President of the jury.

#### Optional courses

Choose 30 ECTS of Technical formation :

*Notice* : for the technical formation, students can choose 30 ECTS of courses from maximum 2 of the options mentioned below (imaging, electricity & electronics, chemistry & biomaterials, modeling, mechanics, informatics)

INFO2055-1	<i>Embedded systems project</i> (english language) - Bernard BOIGELOT - [60h Proj.]	Q2	-	-	[+]	2
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#### Imaging

MATH0461-2	<i>Introduction to numerical optimization</i> (english language) - Quentin LOUVEAUX - [25h Proj.]	Q1	30	20	[+]	5
ELEN0016-2	<i>Computer vision</i> (english language) - Marc VAN DROOGENBROECK - [50h Proj.]	Q1	30	10	[+]	5
PHYS0128-1	<i>Magnetic Resonance Imaging - the Basics</i> (english language) - Evelyne BALTEAU - [3d FW]	Q1	15	-	[+]	3
ELEC0017-1	<i>Electromagnetic compatibility</i> (english language) - Véronique BEAUVOIS, Christophe GEUZAINÉ	Q1	20	40	-	5
ELEN0071-1	<i>Digital Signal Processing</i> (english language) - Jacques VERLY - [40h Proj.]	Q2	45	15	[+]	5
ELEN0062-1	<i>Applied Inductive Learning</i> (english language) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	Q1	30	5	[+]	5
STAT0722-1	<i>Introduction to medical statistics</i> - Christophe PHILLIPS	Q1	10	5	-	2
INFO0939-1	<i>High performance scientific computing</i> (english language) - Christophe GEUZAINÉ - [20h Proj.]	Q1	30	15	[+]	5
INFO0009-1	<i>Database (general organisation)</i> - Pierre WOLPER - [25h Proj.]	Q2	30	25	[+]	5

#### Chemistry & biomaterials

CHIM0605-2	<i>Chemistry and Inorganic Materials</i> - Bénédicte VERTRUYEN - [3d Labo.]	Q2	30	-	[+]	4
CHIM0604-2	<i>Chemistry and Organic Materials</i> - Lionel DELAUDE - [5d Labo.]	Q2	20	10	[+]	4
CHIM0675-1	<i>Macromolecular Chemistry</i> - AnneSophie DUWEZ - [20h Labo.]	Q1	20	-	[+]	3

**Corequisite :**

CHIM0604-2 - Chimie et matériaux organiques

CHIM0698-1 *Physical Chemistry of Interfaces* - Cédric GOMMES Q2 20 10 - 3

CHIM0666-2 *Inorganic materials : manufacturing procedures and propriety* - Stéphanie LAMBERT - [15h Labo., 1d FW] Q1 30 - [+] 4

**Corequisite :**

CHIM0605-2 - Chimie et matériaux inorganiques

CHIM0676-1 *Polymerisation processes* (english language) - Klaus KECK Q2 20 - - 2

CHIM9277-1 *Chemical Reactor Engineering II* - Dominique TOYE - [12h Labo.] Q1 20 4 [+] 3

CHIM0697-1 *Heterogeneous catalysis* (english language) - Nathalie JOB Q1 20 20 - 3

MECA0012-6 *Solid mechanics* - Laurent DUCHENE - [15h Proj.] Q2 30 30 [+] 5

MECA0446-2 *Continuum Mechanics* - JeanPhilippe PONTHOT - [50h Proj.] Q2 30 30 [+] 5

MECA0036-2 *Finite Element Method* (english language) - JeanPhilippe PONTHOT - [40h Proj.] Q2 30 30 [+] 5

MECA0023-1 *Advanced solid mechanics* (english language) - JeanPhilippe PONTHOT - [20h Proj.] Q1 30 30 [+] 5

MECA0464-1 *Large deformation of solids* (english language) - JeanPhilippe PONTHOT - [60h Proj.] Q1 30 30 [+] 5

**Modeling**

SYST0003-1 *Linear control systems* (english language) - Guillaume DRION - [6h Labo.] Q1 30 30 [+] 5

MATH0024-1 *Modelling with partial differential equations* - Maarten ARNST - [25h Proj.] Q1 30 20 [+] 5

INFO0939-1 *High performance scientific computing* (english language) - Christophe GEUZAIN - [20h Proj.] Q1 30 15 [+] 5

MECA0036-2 *Finite Element Method* (english language) - JeanPhilippe PONTHOT - [40h Proj.] Q2 30 30 [+] 5

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

MATH0471-2 *Multiphysics integrated computational project* (english language) - Romain BOMAN, Christophe GEUZAIN - [30h Proj.] TA 20 - [+] 5

MECA0010-1 *Scholastic modelling* (english language) - Maarten ARNST - [28h Proj.] Q2 16 16 [+] 5

INFO0009-1 *Database (general organisation)* - Pierre WOLPER - [25h Proj.] Q2 30 25 [+] 5

**Informatics**

SYST0003-1 *Linear control systems* (english language) - Guillaume DRION - [6h Labo.] Q1 30 30 [+] 5

MATH0462-1 *Discrete optimization* (english language) - Quentin LOUVEAUX - [25h Proj.] Q1 30 20 [+] 5

ELEN0060-2 *Information and coding theory* (english language) - Louis WEHENKEL - [30h Proj.] Q2 30 15 [+] 5

ELEN0062-1 *Applied Inductive Learning* (english language) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.] Q1 30 5 [+] 5

INFO0064-2 *Embedded systems* (english language) - Bernard BOIGELOT Q1 25 20 - 3

INFO0009-1 *Database (general organisation)* - Pierre WOLPER - [25h Proj.] Q2 30 25 [+] 5

**Electricity & Electronics**

SYST0003-1 *Linear control systems* (english language) - Guillaume DRION - [6h Labo.] Q1 30 30 [+] 5

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

ELEN0060-2	<i>Information and coding theory</i> (english language) - Louis WEHENKEL - [30h Proj.]	Q2	30	15	[+]	5
ELEN0070-2	<i>Signal processing</i> (english language) - Jacques VERLY - [40h Proj.]	Q2	45	15	[+]	5
ELEN0074-1	<i>Sensors, microsensors and instrumentation</i> (english language) - Philippe VANDERBEMDEN - [20h Labo.]	Q2	30	-	[+]	5
ELEN0037-1	<i>Microelectronics and IC design</i> (english language) - Michael KRAFT - [40h Proj.]	Q2	30	20	[+]	5
INFO0064-2	<i>Embedded systems</i> (english language) - Bernard BOIGELOT	Q1	25	20	-	3

#### Mechanical Engineering

MECA0036-2	<i>Finite Element Method</i> (english language) - JeanPhilippe PONTHOT - [40h Proj.]	Q2	30	30	[+]	5
MECA0464-1	<i>Large deformation of solids</i> (english language) - JeanPhilippe PONTHOT - [60h Proj.]	Q1	30	30	[+]	5
MECA0031-2	<i>Kinematics and dynamics of mechanisms</i> (english language) - Olivier BRULS - [40h Proj.]	Q2	30	20	[+]	5
MECA0446-2	<i>Continuum Mechanics</i> - JeanPhilippe PONTHOT - [50h Proj.]	Q2	30	30	[+]	5
MECA0025-3	<i>Fluid Mechanics</i> - Eric DELHEZ - [30h Proj.]	Q2	30	30	[+]	5
MECA0008-1	<i>Microfluidics</i> (english language) - Tristan GILET - [16h Labo., 14h Proj.]	Q1	22	8	[+]	5
MECA0444-1	<i>Mechanical design</i> - JeanFrançois DEBONGNIE	Q1	30	30	-	5
MECA0474-1	<i>Mechanical computer-Aided-Design</i> (english language) - Eric BÉCHET - [30h Proj.]	Q1	30	30	[+]	5

*Notice* : with the consent of the academic mentor and the president of the cycle's jury, a course in this list can be replaced by another course (with technical character) borrowed from the bachelor program of engineering

Choose 5 ECTS among:

#### Bloc 2 du programme de l'année

##### Compulsory Courses

*Notice* : with the consent of the President of the jury, notably according to technical matter, the integrated project can be in line with an interdisciplinary project (for example Ingénieur de projets, Eurobot, Eco-Shell Marathon,...), carried out between the third year of the bachelor and the second year of the master

ATFE0016-1	<i>Master thesis (including introduction to research methodology)</i> - COLLÉGIALITÉ	TA	-	-	-	25
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*Notice* : in bloc 1 and bloc 2 together, students choose 30 ECTS technical formation and 30 ECTS research focus. In bloc 1 students choose at least 20 ECTS of technical formation and maximum 10 ECTS of research focus. Exceptions are possible with the accord of the President of the jury.

##### Optional courses

Choose 5 ECTS among:

[...] Choose 5 crédits in the list below:

LANG1957-1	<i>Dutch for Engineers, part 1</i> (dutch language) - Claudine COLIN	Q1	36	-	-	3
LANG2978-1	<i>Dutch for engineer, part 2</i> - Claudine COLIN	Q2	24	-	-	2
LANG1958-1	<i>German for engineer, Part 1</i> (german language) - Françoise CARL	Q1	36	-	-	3
LANG2979-1	<i>German for engineers, part 2</i> - Françoise CARL, ISLV	Q2	24	-	-	2

[...] Or choose 5 ECTS in the course program of the university

##### Single research focus

#### Research focus

*Notice* : the research focus is 30 ECTS, to be distributed over bloc 1 (maximum 10 ECTS Research Focus) and bloc 2. The compulsory internship (choose between the 3 ECTS and 8 ECTS version) is to be complemented with courses from the list below. All courses in the technical program can also be chosen as optional course without special consent of the President of the Cycle.

Choose 30 ECTS among :

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

ASTG0024-1	<i>Immersion internship</i> - Liesbet GERIS	TA	-	-	-	<b>8</b>
ASTG9007-1	<i>Observation placement</i> - Liesbet GERIS	TA	-	-	-	<b>3</b>

#### Imaging and instrumentation

MATH0049-1	<i>Morphological Characterization of Unordered Systems</i> - Silvia BLACHER	Q1	30	30	-	<b>5</b>
ELEN0071-1	<i>Digital Signal Processing</i> (english language) - Jacques VERLY - [40h Proj.]	Q2	45	15	[+]	<b>5</b>
ELEN0072-1	<i>Statistical signal processing</i> (english language) - Jacques VERLY - [40h Proj.]	Q1	45	15	[+]	<b>5</b>
ELEN0038-1	<i>Microsystems</i> (english language) - Michael KRAFT - [20h Labo., 40h Proj.]	Q2	30	5	[+]	<b>5</b>
ELEN0004-1	<i>Semiconductor devices</i> (english language) - Benoît VANDERHEYDEN	Q1	30	30	-	<b>5</b>
ELEC0017-1	<i>Electromagnetic compatibility</i> (english language) - Véronique BEAUVOIS, Christophe GEUZAINÉ	Q1	20	40	-	<b>5</b>
ELEC0041-1	<i>Modelling and design of electromagnetic systems</i> (english language) - Patrick DULAR, Christophe GEUZAINÉ	Q2	30	30	-	<b>5</b>
ELEC0054-1	<i>Application of electrical measurement systems</i> (english language) - Philippe VANDERBEMDEN - [20h Labo.]	Q1	30	10	[+]	<b>5</b>
ELEN0019-2	<i>Audio signal processing : principles and experiments</i> (english language) - JeanJacques EMBRECHTS - [24h Labo., 30h Proj.]	Q1	5	-	[+]	<b>5</b>

#### Bioinformatics

GBIO0015-1	<i>A tour in genetic epidemiology</i> (english language) - Kristel VAN STEEN - [60h Proj.]	Q2	15	15	[+]	<b>3</b>
BIOC0718-2	<i>Structure-function of biomolecules</i> - Mireille DUMOULIN	Q2	15	25	-	<b>4</b>
GENE0436-1	<i>Statistic Genetic</i> - N...		10	10	-	<b>2</b>
GENE0434-1	<i>Experimental genomic techniques</i> - N...		10	10	-	<b>2</b>
GBIO0007-1	<i>Gene sequencing and protein analysis : part a</i> - Bernard JORIS	Q1	10	10	-	<b>2</b>
GBIO0030-1	<i>Computational approaches to statistical generics</i> (english language) - Kristel VAN STEEN - [35h Proj.]	Q2	25	15	[+]	<b>5</b>
GBIO0031-1	<i>Learning from genomic data</i> (english language) - Kristel VAN STEEN - [150h Proj.]	Q2	-	-	[+]	<b>5</b>

#### Mechanics, materials and chemistry

PROT0430-3	<i>Biomedical robotics and active prostheses</i> - Olivier BRULS	Q1	15	10	-	<b>2</b>
MECA0516-1	<i>Mechanical properties of biological and bioinspired materials</i> (english language) - Davide RUFFONI - [3h Labo.]	Q1	15	12	[+]	<b>3</b>
CHIM0072-1	<i>Nanomaterials and divided materials Ingeneering</i> - Benoît HEINRICHS, Stéphanie LAMBERT	Q1	20	15	-	<b>3</b>
MECA0058-1	<i>Fracture mechanics, damage and fatigue</i> (english language) - Ludovic NOELS - [75h Proj.]	Q1	30	10	[+]	<b>5</b>

PHYS0038-1	<i>Introduction into polymer physics including plasturgy</i> - Klaus KECK	Q1	20	20	-	4
BIOL0114-3	<i>Electronic microscopies</i> - Philippe COMPÈRE	Q2	45	15	-	5
CHIM0668-1	<i>Agitation and Mixture</i> - Dominique TOYE - [5h Labo.]	Q1	20	5	[+]	3
BIOC9241-1	<i>Microbial technologies</i> - N...		15	5	-	2
MECA0473-1	<i>Metallic materials Engineering</i> - Jacqueline LECOMTEBECKERS	Q1	30	30	-	5
PHYS0069-1	<i>Introduction to statistical physics</i> - Nicolas VANDEWALLE	Q2	30	30	-	5
<b>Biomedical engineering and modeling</b>						
CHIM0625-1	<i>Molecular mechanics and molecular dynamics</i> - Eric SAUVAGE	Q1	10	10	-	2
SYST0017-1	<i>Advanced topics in systems and control (english language)</i> - Guillaume DRION	Q1	30	30	-	5
GBIO0017-1	<i>Parametric identification of biological models</i> - Dominique TOYE	Q1	10	10	-	2
GBIO0018-2	<i>Introduction to tissue engineering (english language)</i> - Liesbet GERIS	Q2	20	20	-	3
BIOC0430-1	<i>Interaction of living material</i> - Christian GRANDFILS	Q1	25	-	-	3
GBIO0022-1	<i>Biomimeticism (english language)</i> - Philippe COMPÈRE, Liesbet GERIS, Tristan GILET, Eric PARMENTIER, Davide RUFFONI - [45h Proj.]	TA	15	-	[+]	5
GBIO0014-2	<i>Modeling of physiological systems and clinical applications</i> - Thomas DESAIVE	Q1	30	30	-	4

## Programme transitoire à destination des étudiants ayant réussi leur master 1 de "Master en ingénieur civil biomédical, à finalité approfondie" en 2014-2015

### Bloc 1 du programme de l'année

#### Optional courses

##### Single focus

##### Research focus

Choose 30 ECTS among :

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

##### Imaging and instrumentation

MATH0049-1	<i>Morphological Characterization of Unordered Systems</i> - Silvia BLACHER	Q1	30	30	-	5
ELEN0071-1	<i>Digital Signal Processing (english language)</i> - Jacques VERLY - [40h Proj.]	Q2	45	15	[+]	5
ELEN0072-1	<i>Statistical signal processing (english language)</i> - Jacques VERLY - [40h Proj.]	Q1	45	15	[+]	5
ELEN0038-1	<i>Microsystems (english language)</i> - Michael KRAFT - [20h Labo., 40h Proj.]	Q2	30	5	[+]	5
ELEN0004-1	<i>Semiconductor devices (english language)</i> - Benoît VANDERHEYDEN	Q1	30	30	-	5
ELEC0017-1	<i>Electromagnetic compatibility (english language)</i> - Véronique BEAUVOIS, Christophe GEUZAINÉ	Q1	20	40	-	5
ELEC0041-1	<i>Modelling and design of electromagnetic systems (english language)</i> - Patrick DULAR, Christophe GEUZAINÉ	Q2	30	30	-	5
ELEC0054-1	<i>Application of electrical measurement systems (english language)</i> - Philippe VANDERBEMDEN - [20h Labo.]	Q1	30	10	[+]	5

ELEN0019-2	<i>Audio signal processing : principles and experiments</i> (english language) - JeanJacques EMBRECHTS - [24h Labo., 30h Proj.]	Q1	5	-	[+]	5
<b>Bioinformatics</b>						
GBIO0015-1	<i>A tour in genetic epidemiology</i> (english language) - Kristel VAN STEEN - [60h Proj.]	Q2	15	15	[+]	3
BIOC0718-2	<i>Structure-function of biomolecules</i> - Mireille DUMOULIN	Q2	15	25	-	4
GENE0436-1	<i>Statistic Genetic</i> - N...		10	10	-	2
GENE0434-1	<i>Experimental genomic techniques</i> - N...		10	10	-	2
GBIO0007-1	<i>Gene sequencing and protein analysis : part a</i> - Bernard JORIS	Q1	10	10	-	2
GBIO0030-1	<i>Computational approaches to statistical generics</i> (english language) - Kristel VAN STEEN - [35h Proj.]	Q2	25	15	[+]	5
GBIO0031-1	<i>Learning from genomic data</i> (english language) - Kristel VAN STEEN - [150h Proj.]	Q2	-	-	[+]	5
<b>Mechanics, materials and chemistry</b>						
PROT0430-3	<i>Biomedical robotics and active prostheses</i> - Olivier BRULS	Q1	15	10	-	2
MECA0058-1	<i>Fracture mechanics, damage and fatigue</i> (english language) - Ludovic NOELS - [75h Proj.]	Q1	30	10	[+]	5
MECA0516-1	<i>Mechanical properties of biological and bioinspired materials</i> (english language) - Davide RUFFONI - [3h Labo.]	Q1	15	12	[+]	3
CHIM0072-1	<i>Nanomaterials and divided materials Ingeneering</i> - Benoît HEINRICHS, Stéphanie LAMBERT	Q1	20	15	-	3
PHYS0038-1	<i>Introduction into polymer physics including plasturgy</i> - Klaus KECK	Q1	20	20	-	4
BIOL0114-3	<i>Electronic microscopies</i> - Philippe COMPÈRE	Q2	45	15	-	5
CHIM0668-1	<i>Agitation and Mixture</i> - Dominique TOYE - [5h Labo.]	Q1	20	5	[+]	3
BIOC9241-1	<i>Microbial technologies</i> - N...		15	5	-	2
MECA0473-1	<i>Metallic materials Engineering</i> - Jacqueline LECOMTEBECKERS	Q1	30	30	-	5
PHYS0069-1	<i>Introduction to statistical physics</i> - Nicolas VANDEWALLE	Q2	30	30	-	5
<b>Biomedical engineering and modeling</b>						
CHIM0625-1	<i>Molecular mechanics and molecular dynamics</i> - Eric SAUVAGE	Q1	10	10	-	2
SYST0017-1	<i>Advanced topics in systems and control</i> (english language) - Guillaume DRION	Q1	30	30	-	5
GBIO0017-1	<i>Parametric identification of biological models</i> - Dominique TOYE	Q1	10	10	-	2
GBIO0018-2	<i>Introduction to tissue engineering</i> (english language) - Liesbet GERIS	Q2	20	20	-	3
BIOC0430-1	<i>Interaction of living material</i> - Christian GRANDFILS	Q1	25	-	-	3
GBIO0022-1	<i>Biomimetism</i> (english language) - Philippe COMPÈRE, Liesbet GERIS, Tristan GILET, Eric PARMENTIER, Davide RUFFONI - [45h Proj.]	TA	15	-	[+]	5
GBIO0014-2	<i>Modeling of physiological systems and clinical applications</i> - Thomas DESAIVE	Q1	30	30	-	4
<b>Compulsory Courses</b>						
ATFE0016-1	<i>Master thesis (including introduction to research methodology)</i> - COLLÉGIALITÉ	TA	-	-	-	25
<b>Optional courses</b>						
Choose 5 credits among:						
[...]	A course chosen in the course program of the university or 5 credits in the list below. The choice must be					



Study programmes 2015-2016

Faculty of Applied Sciences

Master in biomedical engineering (120 ECTS)

approved by the President of the cycle's jury.