

#### Block view of the study programme

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#### Block 1

Depending on your educational background or depending on the focus, it is possible that the prerequisites / corequisites for the 1st year of the programme are presented in the block 2. You are therefore invited to read through the list of courses in block 2 even if you are registering for the first time in this master.

Within the framework of their Master in Chemical and Materials Science Engineering, all students must follow or validate the 90 credits of joint training and the 30 credits of the professional focus.

Ideally, students studying for the master's degree will have acquired the competences and knowledge corresponding to the 40 credits of technical courses specific to the field of 'Chemical and Materials Science', taught within the framework of the Bachelor in Civil Engineering.

#### Compulsory courses

##### Chemical engineering training

CHIM9299-1	<i>Physical Unit Operations I</i> (english language) - Andreas PFENNIG - [5h Labo.] <b>Corequisite :</b> CHIM0022-4 - Transport phenomena	Q1	30	10	[+]	<b>4</b>
CHIM9300-1	<i>Physical Unit Operations II</i> (english language) - Andreas PFENNIG - [5h Labo.] <b>Prerequisite :</b> CHIM0022-4 - Transport phenomena <b>Corequisite :</b> CHIM9299-1 - Physical Unit Operations I	Q2	30	10	[+]	<b>4</b>
CHIM9277-1	<i>Chemical reactor engineering</i> - Dominique TOYE - [15h Labo.] <b>Corequisite :</b> CHIM9306-1 - Introduction au génie chimique et aux procédés industriels	Q1	35	15	[+]	<b>5</b>
CHIM0697-1	<i>Heterogeneous catalysis</i> (english language) - Nathalie JOB - [10h Proj.] <b>Corequisite :</b> CHIM0022-4 - Transport phenomena	Q1	20	20	[+]	<b>4</b>

##### Training in materials

CHIM0675-1	<i>Macromolecular chemistry</i> - Lionel DELAUDE, AnneSophie DUWEZ - [5d Labo.] <b>Prerequisite :</b> CHIM0604-2 - Chimie et matériaux organiques	Q1	15	-	[+]	<b>3</b>
CHIM0698-1	<i>Physical Chemistry of Interfaces</i> (english language) - Cédric GOMMES	Q2	20	10	-	<b>3</b>
CHIM0676-1	<i>Polymerisation processes</i> (english language) - Klaus KECKANTOINE <b>Corequisite :</b> CHIM0675-1 - Chimie macromoléculaire	Q2	20	-	-	<b>2</b>
CHIM0666-2	<i>Inorganic materials: manufacturing processes and properties of use</i> - Stéphanie LAMBERT, Bénédicte VERTRUYEN - [3d Labo., 1d FW] <b>Prerequisite :</b> CHIM0605-2 - Chimie et matériaux inorganiques	Q2	30	-	[+]	<b>5</b>

##### Training in processes

CHIM0081-3	<i>Industrial Chemistry Processes, structure of chemical industry</i> - Angélique LÉONARD - [1d FW]	Q1	30	-	[+]	<b>3</b>
CHIM0695-2	<i>Introduction to the modelling of chemical processes</i> (english language) - Grégoire LÉONARD <b>Corequisite :</b> CHIM0009-3 - Thermodynamique chimique appliquée	Q1	20	32	-	<b>4</b>
CHIM0696-1	<i>Static and dynamic modelling of large chemical processes</i> (english language) - Grégoire LÉONARD - [1d FW]	Q2	20	32	[+]	<b>4</b>

**Corequisite :**

CHIM0695-2 - Introduction to the modelling of chemical processes

MECA0528-1 *Fluid Machinery used in the Process Industry* (english language) - Q2 21 7 [+] 3  
Koen HILLEWAERT - [4h Labo.]

**Further training in chemistry**

CHIM9289-2 *Analytical chemistry III - Physical methods* Q1 3  
- *Physico-chemical methods of analysis* - Gauthier EPPE 15 - -  
- *Labs* - [5d Labo.] - - [+]

**Corequisite :**

CHIM9284-3 - Chimie analytique I - Méthodes chimiques d'analyse

CHIM9298-1 *Industrial internship in Analytical Chemistry* - Gauthier EPPE - [60h Labo.] Q2 - - [+] 3

**Corequisite :**

CHIM9289-2 - Chimie analytique III - Méthodes physiques

**Integrated project**

PROJ0012-1 *Integrated project* (english language) - MarieNoëlle DUMONT, Nathalie JOB, TA 10 - [+] 10  
Angélique LÉONARD, Grégoire LÉONARD, Andreas PFENNIG,  
Dominique TOYE - [270h Proj., 1d FW]

**Prerequisite :**

CHIM0022-4 - Transport phenomena

CHIM0009-3 - Thermodynamique chimique appliquée

**Corequisite :**

CHIM9300-1 - Physical Unit Operations II

CHIM9299-1 - Physical Unit Operations I

CHIM9277-1 - Génie chimique (étude des réacteurs)

CHIM0697-1 - Heterogeneous catalysis

CHIM0696-1 - Static and dynamic modelling of large chemical processes

CHIM0695-2 - Introduction to the modelling of chemical processes

CHIM0081-3 - Procédés de chimie industrielle

**Block 2**

Depending on your educational background or depending on the focus, it is possible that the prerequisites / corequisites for the 1st year of the programme are presented in the block 2. You are therefore invited to read through the list of courses in block 2 even if you are registering for the first time in this master.

**Compulsory courses**

GEST3162-1 *Principles of management* (english language) - Michael GHILISSEN, Q1 25 25 - 5  
François PICHHAULT

ATFE0004-1 *Master Thesis (including an introduction to research methodology)* - TA - - [+] 25  
COLLÉGIALITÉ, Angélique LÉONARD - [750h Proj.]

**Optional courses**

**Single focus**

**Professional Focus**

*Notice :* Optional courses only take place if there are a minimum number of students registered.

Choose 3 credits among :

ASTG0022-1 *4-week Observation internship (functional analysis)* - TA - - [+] 3  
Benoît HEINRICHS - [20d FW]

**Corequisite :**

GEST3162-1 - Principles of management

GEST3772-1 *Appendix "functional analysis" in the final thesis done in a company* TA - - - 3  
- Benoît HEINRICHS

**Corequisite :**

ATFE0004-1 - Travail de fin d'études (en ce compris une introduction à la méthodologie de la recherche) à l'ULg

GEST3162-1 - Principles of management

GEST3781-1 *Appendix "functional analysis" in a technical intership* - TA - - - **3**  
Benoît HEINRICHS

**Corequisite :**

GEST3162-1 - Principles of management

ASTG0023-1 - Stage technique (8 semaines)

Choose minimum 27 credits worth of optional courses from among the technical placement, the "INGE0012-1" course, the "PROJ0011-2" course and in a maximum of three modules:

ASTG0023-1 *Technical intership (8 weeks)* - Benoît HEINRICHS - [40d FW] TA - - [+] **5**

**Corequisite :**

GEST3162-1 - Principles of management

INGE0012-1 *Scientific research in engineering and its impact on innovation* (english language) - Rodolphe SEPULCHRE Q2 26 26 - **5**

PROJ0011-2 *Personal student project* (english language) - Pierre DUYSINX, Liesbet GERIS, Grégoire LÉONARD - [150h Proj.] TA - - [+] **5**

**Chemical engineering bases**

**Students who have not followed the courses CHIM0022-4, CHIM0009-3, CHIM0606-2, CHIM0605-2 and CHIM0604-2 from the option "Chemistry and material sciences" from bachelor in civil engineering programme or acquired the equivalent knowledge and skills have to choose in priority these five courses in their study programme ; these courses are corequisites of compulsory courses of the master.**

CHIM0022-4 *Transport phenomena* (english language) Q2 **5**  
- Part A - Andreas PFENNIG 30 - -  
- Part B - Andreas PFENNIG - 20 -

CHIM0009-3 *Applied Chemical Thermodynamics* - MarieNoëlle DUMONT, Nathalie JOB, Grégoire LÉONARD Q2 26 26 - **5**

CHIM9284-3 *Analytical chemistry I - Chemical analysis methods* Q1 **5**  
- Theory - Gauthier EPPE 20 - -  
- Practice - Gauthier EPPE - [15h QA Sess.] - - [+]  
- Supplement - Gauthier EPPE - [11h QA Sess.] 6 - [+]

CHIM0605-2 *Chemistry and inorganic materials* - Stéphanie LAMBERT, Bénédicte VERTRUYEN Q2 35 20 - **5**

CHIM0604-2 *Chemistry and organic materials* - Lionel DELAUDE Q2 33 19 - **5**

**Sustainable development : energy and environment**

CHIM0664-1 *Electrochemical energy conversion and storage* (english language) - Nathalie JOB - [15h Labo.] Q1 15 - [+] **3**

CHIM9315-1 *Sustainable management of fuels: supply, synthesis and use* - Angélique LÉONARD, Grégoire LÉONARD Q1 50 - - **5**

MECA0526-1 *High Temperature Processes in Recycling & Remanufacturing* (english language) - Anne MERTENS Q1 26 26 - **5**

CHIM9303-1 *Advanced Question in Chemical Engineering : water sanitation and sludge treatment* - Frank DELVIGNE, Stéphanie LAMBERT, Angélique LÉONARD, Dominique TOYE - [1d FW] Q1 20 15 [+] **3**

CHIM0699-2 *Life cycle assessment - Ecodesign* (english language) - Angélique LÉONARD, N... Q1 10 30 - **3**

CHIM9309-1 *Process Intensification and Hybrid Processes* (english language) - Andreas PFENNIG Q1 25 8 - **3**

MECA0450-3 *Renewable energies* (english language) - Pierre DEWALLEF - [24h Proj., 1d FW] TA 24 12 [+] **5**

GEOL0281-4	<i>Environmental impact of industrial and mining activities -</i> Stoyan GAYDARDZHIEV - [1d FW, 25h Labo., 5h Proj.]	Q1	25	-	[+]	5
<b>Biotechnology and Chemistry</b>						
CHIM0055-1	<i>Chemical Engineering of Polyphase Systems -</i> JeanMarc SCHWEITZER <b>Corequisite :</b> CHIM0697-1 - Heterogeneous catalysis CHIM9277-1 - Génie chimique (étude des réacteurs) CHIM9300-1 - Physical Unit Operations II	Q1	20	30	-	4
CHIM0668-1	<i>Agitation and mixture -</i> Dominique TOYE - [5h Labo.] <b>Corequisite :</b> CHIM9277-1 - Génie chimique (étude des réacteurs)	Q1	30	5	[+]	4
CHIM9302-1	<i>Advanced Question in Chemical Engineering : Biotechnology -</i> Frank DELVIGNE, Aurore RICHEL, Dominique TOYE - [30h Proj., 1d FW]	Q1	30	10	[+]	5
<b>Procedures</b>						
CHIM0054-2	<i>Introduction to economic analysis, application to industrial processes (english language) -</i> Grégoire LÉONARD - [90h Proj.] <b>Prerequisite :</b> PROJ0012-1 - Integrated project	Q1	10	-	[+]	4
CHIM9301-1	<i>Project management and engineering methods in the industry (english language) -</i> Grégoire LÉONARD - [1d FW] <b>Prerequisite :</b> PROJ0012-1 - Integrated project	Q1	20	15	[+]	4
CHIM0074-2	<i>Seminars on industrial security -</i> JeanLuc BOZET, Angélique LÉONARD, Dominique TOYE - [2d FW] <b>Corequisite :</b> CHIM9277-1 - Génie chimique (étude des réacteurs)	Q1	15	-	[+]	2
GEST0188-1	<i>Determination and recognition of quality and conformity - Common theory -</i> Pierre DEWALLEF <i>- practice -</i> Joëlle WIDART <b>Corequisite :</b> MECA0521-1 - Gestion QSHE	Q1	15	-	-	3
GEOL0314-1	<i>Mineral processing I - basics (english language) -</i> Stoyan GAYDARDZHIEV - [30h Labo., 10h Proj., 1,5d FW]	Q1	30	-	[+]	5
GEOL0315-1	<i>Solid Waste and by products processing (english language) -</i> Stoyan GAYDARDZHIEV - [20h Labo., 7h Proj., 1,5d FW]	Q1	20	-	[+]	5
<b>Materials Science</b>						
CHIM0072-2	<i>Nanomaterials and divided materials engineering -</i> Benoit HEINRICHS, Stéphanie LAMBERT <b>Corequisite :</b> CHIM0698-1 - Physical chemistry of interfaces CHIM0666-2 - Matériaux inorganiques : procédés de fabrication et propriétés d'usage	Q1	15	15	-	3
PHYS0038-2	<i>Introduction into polymer physics including plasturgy (english language) -</i> Klaus KECKANTOINE <b>Corequisite :</b> CHIM0676-1 - Polymerisation processes	Q1	30	-	-	3
MECA0462-2	<i>Materials selection (english language) -</i> Anne MERTENS, Davide RUFFONI - [30h Proj., 1d FW]	Q1	26	26	[+]	5
BIOC0430-1	<i>Interaction of living material -</i> Christian GRANDFILS	Q1	25	-	-	3
MECA0516-1	<i>Mechanical properties of biological and bioinspired materials (english language) -</i> Davide RUFFONI - [4h Labo.]	Q1	26	22	[+]	5

#### Organising the materials

MECA0464-1	<i>Large deformation of solids</i> (english language) - JeanPhilippe PONTHOT - [60h Proj.]	Q1	26	26	[+]	5
	<b>Corequisite :</b> MECA0023-1 - Advanced solid mechanics					
MECA0023-1	<i>Advanced solid mechanics</i> (english language) - JeanPhilippe PONTHOT - [30h Proj.]	Q1	26	26	[+]	5
MECA0473-1	<i>Metallic materials engineering</i> - Anne MERTENS	Q1	26	26	-	5
MECA0139-1	<i>Additive manufacturing and 3D printing</i> (english language) - Thierry DORMAL, Anne MERTENS	Q1	26	26	-	5

#### Bloc d'aménagement du programme de l'année

### Additional ECTS Master in chemical and materials science engineering

#### Optional courses

Each student's programme will be determined by the jury depending on their prior training. If an applicant does not meet certain prerequisites, his or her programme may include up to 60 additional course credits essentially taken from the list below :

MATH0066-1	<i>Complement of mathematics 2</i> - Patricia TOSSINGS	Q2	26	26	-	4
CHIM0286-1	<i>Rudiments of thermodynamics</i> - Benoît HEINRICHS	Q1	26	26	-	5
MECA0001-2	<i>Mechanics of materials</i> - JeanPierre JASPART - [2h Labo., 12h Proj.]	Q1	27	25	[+]	5
MECA0011-2	<i>Fluid Mechanics : Basics</i> - Michel PIROTON - [25h Proj.]	Q2	20	30	[+]	4
CHIM9306-1	<i>Introduction to chemical engineering and industrial processes</i> - MarieNoëlle DUMONT, Nathalie JOB, Dominique TOYE - [20h Proj.]	Q2	24	24	[+]	5
CHIM0604-2	<i>Chemistry and organic materials</i> - Lionel DELAUDE	Q2	33	19	-	5
CHIM0022-4	<i>Transport phenomena</i> (english language) - Part A - Andreas PFENNIG - Part B - Andreas PFENNIG	Q2	30	-	-	5
CHIM0009-3	<i>Applied Chemical Thermodynamics</i> - MarieNoëlle DUMONT, Nathalie JOB, Grégoire LÉONARD	Q2	26	26	-	5
CHIM9284-3	<i>Analytical chemistry I - Chemical analysis methods</i> - Theory - Gauthier EPPE - Practice - Gauthier EPPE - [15h QA Sess.] - Supplement - Gauthier EPPE - [11h QA Sess.]	Q1	20	-	-	5
CHIM0605-2	<i>Chemistry and inorganic materials</i> - Stéphanie LAMBERT, Bénédicte VERTRUYEN	Q2	35	20	-	5
MATH0006-3	<i>Introduction to numerical analysis</i> (english language) - Quentin LOUVEAUX	Q1	20	20	-	4

[...] Choose maximum 8 credit to complete the study programme

### Master en ingénieur civil en chimie et science des matériaux, à finalité - Programme aménagé pour les bacheliers en sciences chimiques