

#### 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.

#### Cours obligatoires du tronc commun

##### 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	[+]	5
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	[+]	4
CHIM9277-1	<i>Chemical reactor engineering</i> - Dominique TOYE - [15h Labo.] <b>Corequisite :</b> CHIM9320-1 - Introduction au génie de la réaction chimique	Q1	30	10	[+]	5
CHIM0697-1	<i>Heterogeneous catalysis</i> (english language) - Nathalie JOB - [10h Proj.] <b>Corequisite :</b> CHIM9320-1 - Introduction au génie de la réaction chimique CHIM0022-4 - Transport phenomena	Q1	20	20	[+]	5

##### Training in materials

CHIM0698-1	<i>Introduction to the Physical Chemistry of Nanomaterials</i> (english language) - Cédric GOMMES	Q2	20	10	-	3
CHIM9319-1	<i>Chemistry and technology of polymers</i> (english language) - Antoine DEBUIGNE, Klaus KECKANTOINE - [10h Proj., 12h Labo.] <b>Corequisite :</b> CHIM0604-2 - Chimie et matériaux organiques	Q2	30	-	[+]	5
CHIM0605-2	<i>Chemistry and inorganic materials</i> - Bénédicte VERTRUYEN - [3d Labo.]	Q2	30	-	[+]	5

##### Training in processes

CHIM0695-2	<i>Modelling of chemical &amp; energy processes</i> (english language) - Grégoire LÉONARD <b>Corequisite :</b> CHIM0009-3 - Thermodynamique chimique appliquée	Q1	20	32	-	5
CHIM0696-1	<i>Static and dynamic modelling of large chemical processes</i> (english language) - Grégoire LÉONARD - [1d FW] <b>Corequisite :</b> CHIM0695-2 - Modelling of chemical & energy processes	Q2	20	32	[+]	4
MECA0528-1	<i>Practical fluid mechanics for the process industry</i> (english language) - Koen HILLEWAERT - [4h Labo.]	Q2	35	7	[+]	4

##### Further training in chemistry

CHIM9284-3	<i>Analytical chemistry I - Chemical analysis methods</i>					5
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### Master MSc. in Chemical and Materials Science Engineering, professional focus in Chemical Engineering

- <i>Theory</i> - Gauthier EPPE	26	-	-
- <i>Tutorials</i> - Gauthier EPPE - [26h Mon. WS]	-	-	[+]
- <i>Laboratories</i> - Gauthier EPPE - [5d Labo.]	-	-	[+]

#### Integrated project

PROJ0012-1	<i>Integrated Project</i> (english language) - MarieNoëlle DUMONT, Samuel GENDEBIEN, Nathalie JOB, Angélique LÉONARD, Grégoire LÉONARD, Andreas PFENNIG, Dominique TOYE - [270h Proj., 1d FW]	TA	20	-	[+]	10
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**Prerequisite :**  
 CHIM0009-3 - Thermodynamique chimique appliquée  
 CHIM0022-4 - Transport phenomena

**Corequisite :**  
 CHIM0695-2 - Modelling of chemical & energy processes  
 CHIM0696-1 - Static and dynamic modelling of large chemical processes  
 CHIM0697-1 - Heterogeneous catalysis  
 CHIM9277-1 - Génie chimique (étude des réacteurs)  
 CHIM9299-1 - Physical Unit Operations I  
 CHIM9300-1 - Physical Unit Operations II

#### Block 2

#### Focus courses

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

Choose 30 credits from:

#### Chemical engineering bases

L'étudiant qui n'a pas suivi les cours CHIM0022-4, CHIM0009-3, CHIM9320-1 et CHIM0604-2 de l'option "Chimie et science des matériaux" du programme de bachelier ingénieur civil ou acquis les connaissances et compétences correspondantes inscrit prioritairement ces cinq cours à son programme ; ces cours sont des corequis de cours obligatoires du master.

*Notice* : Remarque : l'étudiant a l'obligation de réaliser un stage en entreprise soit à travers le cours ASTG0023-1 soit en incluant le stage dans son TFE.

ASTG0023-1	<i>Technical internship (8 weeks)</i> - Benoît HEINRICHS - [40d FW]	TA	-	-	[+]	5
	<b>Corequisite :</b> GEST3162-1 - Principles of management					
CHIM0664-1	<i>Electrochemical energy conversion and storage</i> (english language) - <i>partim 1</i> - Nathalie JOB - <i>partim 2</i> - Nathalie JOB - [15h Labo.]	Q1	15	-	-	3
			-	-	[+]	
MECA0526-1	<i>High Temperature Processes in Recycling &amp; Remanufacturing</i> (english language) - Anne MERTENS - [1d FW]	Q1	26	26	[+]	5
CHIM9303-1	<i>Advanced Question in Chemical Engineering : water sanitation and sludge treatment</i> - Frank DELVIGNE, Stéphanie LAMBERT, Angélique LÉONARD, Dominique TOYE - [1d FW]	Q1	20	15	[+]	3
CHIM0699-2	<i>Life cycle assessment - Ecodesign</i> (english language) - Angélique LÉONARD	Q1	10	30	-	3
CHIM9309-1	<i>Process Intensification and Hybrid Processes</i> (english language) - Andreas PFENNIG	Q1	25	8	-	3
MECA0450-3	<i>Renewable Energy System Design</i> (english language) - Pierre DEWALLEF - [24h Proj., 1d FW]	Q1	24	12	[+]	5
CHIM0668-1	<i>Agitation and mixture</i> - Dominique TOYE - [5h Labo.]	Q1	30	5	[+]	4
	<b>Corequisite :</b> CHIM9277-1 - Génie chimique (étude des réacteurs)					
CHIM0054-2	<i>European student contest EURECHA : process design project</i> (english language) - Grégoire LÉONARD - [90h Proj.]	Q1	10	-	[+]	4

**Prerequisite :**

PROJ0012-1 - Integrated Project

CHIM9301-1 *Project management and engineering methods in the industry (english language)* - Grégoire LÉONARD - [1d FW] Q1 20 15 [+] 4

**Prerequisite :**

PROJ0012-1 - Integrated Project

CHIM0074-2 *Seminars on industrial security* - Angélique LÉONARD, Dominique TOYE - [2d FW] Q1 15 - [+] 2

**Corequisite :**

CHIM9277-1 - Génie chimique (étude des réacteurs)

PHYS0038-2 *Introduction into polymer physics including plasturgy (english language)* - Klaus KECKANTOINE Q1 30 - - 3

CHIM0072-2 *Nanomaterials and divided materials engineering* - Benoît HEINRICHS, Stéphanie LAMBERT Q1 15 15 - 3

**Corequisite :**

CHIM0698-1 - Introduction to the Physical Chemistry of Nanomaterials

CHIM9289-3 *Analytical chemistry III - Physical methods* Q1 3 3  
*- Physico-chemical analysis methods* - Gauthier EPPE 15 - -  
*- Electrochemical analysis methods* - Gauthier EPPE 15 - -

GEOL0314-1 *Mineral processing I - basics (english language)* - Stoyan GAYDARDZHIEV Q1 30 - [+] 5  
 - [30h Labo., 10h Proj., 1,5d FW]

BIOC0430-1 *Interactions materials - living systems (english language)* - Dorien VAN HEDE Q1 25 - - 3

[...] Students may also choose courses for a maximum of 10 credits in other masters of the faculty or du catalogue UNIC.

#### Cours obligatoires du tronc commun

GEST3162-1 *Principles of management (english language)* - Michaël PARMENTIER - [25h Proj.] Q1 30 - [+] 5

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

#### 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 :

*Notice :* students who have not followed the courses CHIM0022-4, CHIM0009-3, CHIM9320-1 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.

MATH0066-1 *Complement of mathematics 2* - Patricia TOSSINGS Q2 26 26 - 4

CHIM0286-1 *Rudiments of thermodynamics* - Benoît HEINRICHS Q1 26 26 - 5

MECA0001-2 *Mechanics of materials* - Laurent DUCHENE - [2h Labo., 12h Proj.] Q1 27 25 [+] 5

MECA0011-2 (pas organisé en 2024-2025) *Fluid Mechanics : Basics* - Michel PIROTON - [25h Proj.] Q2 20 30 [+] 4

CHIM9322-1	<i>Industrial chemistry processes</i> - Part 1 - the structure of the chemical industry - MarieNoëlle DUMONT, Angélique LÉONARD, Dominique TOYE - Part 2 - the balance approach - MarieNoëlle DUMONT, Angélique LÉONARD, Dominique TOYE - [1d FW]	28	-	-		<b>5</b>
CHIM0604-2	<i>Chemistry and organic materials</i> - Lionel DELAUDE	Q2	33	19	-	<b>5</b>
CHIM0022-4	<i>Transport phenomena</i> (english language) - Part A - Andreas PFENNIG - Part B - Andreas PFENNIG	Q2	30	-	-	<b>5</b>
CHIM0009-3	<i>Applied Chemical Thermodynamics</i> - MarieNoëlle DUMONT, Nathalie JOB, Grégoire LÉONARD	Q2	26	26	-	<b>5</b>
MATH0006-3	<i>Introduction to numerical analysis</i> (english language) - Quentin LOUVEAUX	Q1	20	20	-	<b>4</b>
CHIM9320-1	<i>Introduction to chemical reaction engineering</i> - Nathalie JOB, Dominique TOYE	Q1	24	24	-	<b>5</b>
CHIM9315-1	<i>Sustainable management of fuels: supply, synthesis and use</i> - Angélique LÉONARD, Grégoire LÉONARD - [1d FW, 10h Proj.]	Q1	50	-	[+]	<b>5</b>
[...]	Choose maximum 8 credit to complete the study programme					

## Additional ECTS for students holding a Bachelor `s degree in chemistry

### Compulsory courses

MATH0066-1	<i>Complement of mathematics 2</i> - Patricia TOSSINGS	Q2	26	26	-	<b>4</b>
CHIM0286-1	<i>Rudiments of thermodynamics</i> - Benoît HEINRICHS	Q1	26	26	-	<b>5</b>
MECA0001-2	<i>Mechanics of materials</i> - Laurent DUCHENE - [2h Labo., 12h Proj.]	Q1	27	25	[+]	<b>5</b>
MECA0011-2	(pas organisé en 2024-2025) <i>Fluid Mechanics : Basics</i> - Michel PIROTON - [25h Proj.]	Q2	20	30	[+]	<b>4</b>
CHIM9322-1	<i>Industrial chemistry processes</i> - Part 1 - the structure of the chemical industry - MarieNoëlle DUMONT, Angélique LÉONARD, Dominique TOYE - Part 2 - the balance approach - MarieNoëlle DUMONT, Angélique LÉONARD, Dominique TOYE - [1d FW]	28	-	-		<b>5</b>
CHIM0022-4	<i>Transport phenomena</i> (english language) - Part A - Andreas PFENNIG - Part B - Andreas PFENNIG	Q2	30	-	-	<b>5</b>
CHIM0009-3	<i>Applied Chemical Thermodynamics</i> - MarieNoëlle DUMONT, Nathalie JOB, Grégoire LÉONARD	Q2	26	26	-	<b>5</b>
MATH0006-3	<i>Introduction to numerical analysis</i> (english language) - Quentin LOUVEAUX	Q1	20	20	-	<b>4</b>
CHIM9320-1	<i>Introduction to chemical reaction engineering</i> - Nathalie JOB, Dominique TOYE	Q1	24	24	-	<b>5</b>