Master in Chemistry

Programme mnemonic
MA-CHIM
- Focus *Research* : M-CHIMA
- Focus *Teaching* : M-CHIMD
- Focus *Professional* : M-CHIMS

Studies level
Master 120 credits

Learning language
french

Schedule
office hours

Studies category / subcategory
Sciences and technics / Sciences

Campus
Plaine and Solbosch

Programme objectives

Due to its central position among hard sciences, chemistry opens up extremely broad possibilities, with links to biochemistry, medicine, geology, physics, or biology. Creating materials with new properties, developing alternative energy sources, synthesising new medicines, ensuring high quality in foodstuffs, and monitoring and reducing pollution are all examples of the challenges that chemists take on. Today, chemistry is the cornerstone of many sustainable development topics. ULB's Chemistry Department is fully aware of these challenges and trains students to analyse new societal problems and call upon their creative potential to solve them. The goal of the Master in Chemistry is to complete the basic training provided in the Bachelor programme, and develop the students' analytical skills and autonomy.

Programme's added value

ULB's Chemistry Department is ideally situated, both geographically and strategically. Located in Europe's capital, at the heart of a vast network of chemical industries, the department provides high-level training through direct contact with SMEs and major players in the industry on the one hand, and with cutting-edge academic circles on the other hand.

Moreover, due to its international scientific reputation, it strives to provide excellent training in a multidisciplinary academic context, in line with the major technological and environmental issues of our time.

At the Master level, student mobility is encouraged in the form of work placements in private companies, either in Belgium or abroad.

Chemists play an active role in our society. The Master programme includes content targeting various professional activities (industries, research and teaching). In the professional world, graduates of this programme put their knowledge and skills into practice as chemists in research laboratories and production units, or as scientific experts and advisors. They are often hired in leading-edge chemical industries, in which they can quickly reach senior positions.

The Master programme's curriculum allows students to:

- Develop specialised interdisciplinary knowledge
- Understand advanced concepts in the various branches of chemistry
- Acquire an interdisciplinary culture
- Conduct original research in a specialised branch of chemistry
- Show innovation and creativity
- Apply skills and knowledge to autonomously develop and manage a project
- Solve complex problems
- Identify risks and anticipate the consequences of decisions
- Integrate multidisciplinary aspects into project management
- Identify the potential for technological developments in a given research project in the field of chemistry (research focus)
- Recognise the industrial and economic importance of intellectual property (professional focus)
- Be an active partner of multidisciplinary projects in a complex industrial context (scientific, economic, environmental, etc.) (professional focus)
- Transpose the knowledge and methods acquired into various objects of study

ULB is the only comprehensive university located in the capital of Europe. Almost one third of its students are foreigners, a major asset that makes ULB the most open university in Belgium.

The Chemistry Department includes various research groups that are internationally recognised, whose works were rewarded by several prestigious prizes. ULB's Chemistry Department is the only one in Belgium that has received a Nobel Prize in Chemistry.

The Chemistry Department also benefits from the scientific activities (symposia, conferences) organised by the Solvay Institutes of Physics and Chemistry located within the University.

Teaching methods

Lecture classes, practical activities, hands-on training, personal assignments, projects.

Succeed in your studies

Choose

The information and guidance counsellors at the InfOR-études [https://www.ulb.be/en/studies-info-desk-1] service will help you choose your studies throughout the year.

Succeed

Take part in preparatory courses [https://www.ulb.be/en/studies-info-desk-1] or get help to succeed [https://www.ulb.be/en/studies-info-desk-1] , before or during your studies.

Get help

Apply for financial aid, look for accommodation or a student job, get support [https://www.ulb.be/fr/aides-services-et-accompagnement/aid-services-and-support-1] for your specific needs.

International/Openness

Exchanges—lasting 6 to 12 months—with other Belgian or foreign universities can be organised.

ULB has concluded partnerships with 10 secondary schools and around 20 companies, research laboratories or centres, offering attractive opportunities for work placements. Many exchange opportunities with foreign universities are available (see the list provided by the DRI)

https://www.ulb.be/en/mobility/international

One fundamental goal of the Master in Chemistry is to give students a deep understanding of the basic concepts used in chemical sciences, and how they interact. The programme places emphasis on teaching autonomy, with personal projects and a Master's dissertation to be defended at the end of the second year.

The curriculum includes both theoretical and practical teachings. Six series of lectures must be chosen amongst the seven following:

- Polymer chemistry
- Macroscopic physical chemistry: from self-assembling to self-organisation,
- Strategies for organic synthesis,
- Computational approaches to the states of matter,
- Chemistry of interfaces and nanostructures,
- Chemistry and structure of biological macromolecules,
- Environmental chemistry and chemical risks.

Students also choose a number of elective courses in a field of interest, and complete a research-oriented dissertation in the second year, working within one of the department's research units.

Job opportunities

In the professional world, graduates of this programme put their knowledge and skills into practice as chemists in research laboratories and production units, or as scientific experts and advisors. They are often hired in leading-edge chemical industries, in which they can quickly reach senior positions.

A Master's degree in Chemistry opens up job opportunities in the following areas:

- Industrial or academic research
- State-run services: crime laboratories, heritage conservation laboratories, health services, etc.
- Teaching
- Production
- Analysis
- Technical and commercial sectors
- Health

Chemists can be viewed as architects, creating new molecules, developing new materials, developing and optimising manufacturing processes, contributing to improving the quality of life in many areas (medicine, environment, energy, food, cosmetics, etc.).

Activity sectors

Chemical companies (petrochemical industry, polymers, fertilisers, fine chemistry, specialties, paints, pigments, oleochemistry, catalysts, etc.)

- Pharmaceutical companies
- Consumer goods (cleaners, glues, cosmetics, etc.)
- Environment, recycling
- Chemical engineering
- Analysis and control laboratories
- Research and development
- Teaching
- Academic sector (research and teaching in universities and higher education institutions)
- Federal institutions

Types of functions:

Research and development, intellectual property, product stewardship, project leading, etc.

The chemist can be viewed as an architect, creating new molecules, developing new materials, developing and optimizing manufacturing processes, contributing to the improvement of the quality of life in many areas (medicine, environment, energy, food, cosmetics,...)

Contacts

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Master in Chemistry
Focus Research

One fundamental goal of the Master in Chemistry is to give students a deep understanding of the basic concepts used in chemical sciences, and how they interact. The programme places emphasis on teaching autonomy, with personal projects and a Master's dissertation to be defended at the end of the second year.

The curriculum includes both theoretical and practical teachings. Six series of lectures must be chosen amongst the seven following:

- Polymer chemistry
- Macroscopic physical chemistry: from self-assembling to self-organisation,
- Strategies for organic synthesis,
- Computational approaches to the states of matter,
- Chemistry of interfaces and nanostructures,
- Chemistry and structure of biological macromolecules,
- Environmental chemistry and chemical risks.

Students also choose a number of elective courses in a field of interest, and complete a research-oriented dissertation in the second year, working within one of the department's research units.

Bloc 1 | M-CHIMA | MA-CHIM

Module 1: Cours de base

Six courses chosen from the following

CHIM-F406 (optional) — Chimie des polymères | Yves GEERTS (Coordinator) and Olivier DEBEVER
5 credits [lecture: 36h, tutorial classes: 12h] first term French

CHIM-F408 (optional) — Chimie physique macroscopique: de l'auto-assemblage à l'auto-organisation | Anne DE WIT (Coordinator) and Laurence RONGY
5 credits [lecture: 36h, tutorial classes: 24h] first term French

CHIM-F436 (optional) — Stratégies de synthèse organique | Gwilherm EVANO (Coordinator) and Cédric Theunissen
5 credits [lecture: 36h, practical work: 24h, project: 40h] first term French

CHIM-F443 (optional) — Approches computationnelles des états de la matière | Nathalie VAECK (Coordinator), Antoine Aerts, Emilie CAUET and Martine PREVOST
5 credits [practical work: 36h, project: 24h] first term French

CHIM-F466 (optional) — Chimie et structure des macromolécules biologiques | Vincent RAUSSENS (Coordinator), Cédric GOVAERTS and Chloé MARTENS
5 credits [lecture: 36h, tutorial classes: 24h] first term French

CHIM-F467 (optional) — Chimie des interfaces et nanostructures | Thomas DONEUX (Coordinator), François RENIERS, Jon USTARROZ TROYANO and Thierry VISART DE BOCARME
5 credits [lecture: 36h, practical work: 24h, project: 24h] first term French

CHIM-F474 (optional) — Chimie de l'environnement et risques chimiques | Pierre-François COHEUR (Coordinator) and Laurence RONGY
5 credits [lecture: 36h, tutorial classes: 12h, practical work: 12h] first term French

Module 2: Cours obligatoire

Ce cours peut être suivi en bloc 2

CHIM-F485 La Recherche académique et sa gestion | Yves GEERTS (Coordinator) and Jean-Christophe LELOUP
5 credits [lecture: 24h, project: 60h] second term French

Module 3: Cours à options

5 cours de 5 crédits à choisir dans la liste ci-dessous ou, moyennant accord du Jury et avec un maximum de 10 crédits pour le cycle, parmi les cours d'une autre finalité du Master en sciences chimiques ou encore dans
un autre Master d'une université de la fédération Wallonie-Bruxelles.
Le cours de base non suivi du module 1 peut être un de ces cours à option

Five courses chosen from the following

BING-F4007 (optional) Compléments de biochimie et de microbiologie | Sigrid FLAHAUT (Coordinator) and Nausicaa NORET
5 credits [lecture: 48h, practical work: 12h] second term French

CHIM-F4001 (optional) Rational drug design and PKPD modeling | Jean-Christophe LELOUP (Coordinator) and Martine PREVOST
5 credits [lecture: 36h, tutorial classes: 12h, project: 24h] second term English

CHIM-F401 (optional) Chimie physique moléculaire : structure, spectroscopie et dynamique | Nathalie VAECK (Coordinator), Antoine Aerts, Emilie CAUET and Jean VANDER AUWERA
5 credits [lecture: 12h, practical work: 24h, project: 24h] second term French

CHIM-F402 (optional) Catalyse | Thierry VISART DE BOCARME (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h, project: 12h] second term French

CHIM-F405 (optional) Photophysique des atmosphères et des milieux interstellaires | Nathalie VAECK (Coordinator), Sophie Bauduin and Lieven CLARISSE
5 credits [lecture: 36h, project: 12h] second term English/French

CHIM-F407 (optional) Dynamiques non linéaires et instabilités de non-équilibre | Anne DE WIT (Coordinator) and Laurence RONGY
5 credits [lecture: 36h, project: 24h] second term French

CHIM-F415 (optional) Electrochimie : Concepts, Techniques et Applications | Thomas DONEUX (Coordinator) and Jon USTARROZ TROYANO
5 credits [lecture: 36h, tutorial classes: 12h, project: 12h] second term English/French

CHIM-F418 (optional) Chimie supramoléculaire - Récepteurs moléculaires synthétiques | Ivan JABIN (Coordinator) and Michel LUHMER
5 credits [lecture: 36h, practical work: 12h, project: 30h] second term French

CHIM-F419 (optional) Chimie physique des mileux dilués | Jean VANDER AUWERA (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h] second term French

CHIM-F422 (optional) Modélisation des rythmes du vivant | Didier GONZE (Coordinator), Geneviève DUPONT and Jean-Christophe LELOUP
5 credits [lecture: 24h, tutorial classes: 24h, project: 30h] second term French

CHIM-F423 (optional) Photochimie des composés organiques, inorganiques et organométalliques | Cécile MOUCHERON (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h, project: 30h] second term French

CHIM-F425 (optional) Plasma chemistry and physics | François RENIERS (Coordinator)
5 credits [lecture: 24h, tutorial classes: 12h] second term French

CHIM-F430 (optional) Chimie et catalyse organométalliques | Gwilherm EVANO (Coordinator) and Cédric Theunissen
5 credits [lecture: 42h, tutorial classes: 6h] second term French

CHIM-F433 (optional) Interactions supramoléculaires | Yves GEERTS (Coordinator)
5 credits [lecture: 24h, tutorial classes: 24h] second term French

CHIM-F434 (optional) Synthèse de biomolécules et introduction à la chimie médicinale | Gwilherm EVANO (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h] second term French

CHIM-F438 (optional) Surface analysis of materials | François RENIERS (Coordinator) and Herman TERRYN
5 credits [lecture: 24h, tutorial classes: 12h] second term English

CHIM-F440 (optional) Spectroscopie et modélisation des protéines | Vincent RAUSSENS (Coordinator), Martine PREVOST and Jehan Waeytens
5 credits [lecture: 36h, tutorial classes: 24h] second term French

CHIM-F457 (optional) Résonance magnétique nucléaire | Michel LUHMER (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h] second term French

CHIM-F460 (optional) Modélisation et analyse des systèmes stochastiques complexes | Yannick DE DECKER (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h] second term French

ENVI-F451 (optional) Télédétection des variables climatiques et environnementales | Pierre-François COHEUR (Coordinator), Sophie Bauduin and Lieven CLARISSE
5 credits [lecture: 36h, project: 40h] second term English/French

ENVI-F526 (optional) Sciences de l'atmosphère et changements climatiques | Pierre-François COHEUR (Coordinator) and Cathy CLERBAUX
5 credits [lecture: 36h, project: 24h] second term French

ENVI-F527 (optional) Matière et énergie dans l'environnement: analyse, transport et instabilités | François FRIPIAT (Coordinator) and Anne DE WIT
5 credits [lecture: 36h, practical work: 24h] second term French

One course chosen from the following

TEMP-0000 (optional) Cours extérieurs au programme
5 credits academic year French

TEMP-0000 (optional) Cours extérieurs au programme
6 credits academic year French

TEMP-0000 (optional) Cours extérieurs au programme
7 credits academic year French

TEMP-0000 (optional) Cours extérieurs au programme
8 credits academic year French

TEMP-0000 (optional) Cours extérieurs au programme
9 credits academic year French

TEMP-0000 (optional) Cours extérieurs au programme
10 credits academic year French

Module 4: Stages académiques obligatoires

Choisir 25 crédits de stages répartis entre deux équipes de recherche différentes, chaque stage faisant au minimum 10 crédits. Un stage à l'extérieur de l'ULB peut compter pour 25 crédits. Cet enseignement peut être suivi en bloc 2.

Sauf dérogation accordée par le jury, l'accès aux stages est conditionné à la réussite préalable d'au moins 15 crédits du programme de Master. Les données et résultats expérimentaux/théoriques des stages doivent être différents de ceux du mémoire.

Up to 25 credits chosen from the following

STAG-F001 (optional) Stage de recherche hors ULB | Ivan JABIN (Coordinator)
25 credits [project: 80h, work placement: 507h] second term French

STAG-F002 (optional) Stage de recherche 1 | Ivan JABIN (Coordinator)
10 credits [project: 30h, work placement: 195h] second term French

STAG-F003 (optional) Stage de recherche 2 | Ivan JABIN (Coordinator)
15 credits [project: 50h, work placement: 312h] second term French

Master in Chemistry
Focus Research

Bloc 2 | M-CHIMA | MA-CHIM

Tronc commun

L'accès au mémoire est conditionné à la réussite préalable d'au moins 30 crédits du programme de master.

MEMO-F531 Mémoire | Gwilherm EVANO (Coordinator)
30 credits [project: 304h, mfe/tfe: 496h] first and second terms

Module 1: Cours obligatoire

Ce cours peut être suivi en Bloc 1.

CHIM-F485 La Recherche académique et sa gestion | Yves GEERTS (Coordinator) and Jean-Christophe LELOUP
5 credits [lecture: 24h, project: 60h] second term French

Module 2 - Stages académiques obligatoires

Choisir 25 crédits de stages répartis entre deux équipes de recherche différentes, chaque stage faisant au minimum 10 crédits. Un stage à l'extérieur de l'ULB peut compter pour 25 crédits. Cet enseignement peut être suivi en Bloc 1. Sauf dérogation accordée par le jury, l'accès aux stages est conditionné à la réussite préalable d'au moins 15 crédits du programme de Master. Les données et résultats expérimentaux/théoriques des stages doivent être différents de ceux du mémoire.

Choisir 25 crédits de stages répartis entre deux équipes de recherche différentes, chaque stage faisant au minimum 10 crédits.

Up to 25 credits chosen from the following

STAG-F001 (optional) Stage de recherche hors ULB | Ivan JABIN (Coordinator)
25 credits [project: 80h, work placement: 507h] second term French

STAG-F002 (optional) Stage de recherche 1 | Ivan JABIN (Coordinator)
10 credits [project: 30h, work placement: 195h] second term French

STAG-F003 (optional) Stage de recherche 2 | Ivan JABIN (Coordinator)
15 credits [project: 50h, work placement: 312h] second term French

Module 3 - Cours à options

Choisir un ensemble de cours à option pour arriver à un total de 60 crédits parmi la liste du module 3 du bloc 1 ou, moyennant accord du Jury et avec un maximum de 10 crédits pour le cycle, parmi les cours d'une autre

finalité du Master en sciences chimiques ou encore dans un autre Master d'une université de la fédération Wallonie-Bruxelles. Le cours de base non suivi du module 1 du bloc 1 peut être un de ces cours à option.

Up to ten credits chosen from the following

One course chosen from the following

TEMP-0000 (optional) Cours extérieurs au programme
5 credits academic year French

TEMP-0000 (optional) Cours extérieurs au programme
6 credits academic year French

TEMP-0000 (optional) Cours extérieurs au programme
7 credits academic year French

TEMP-0000 (optional) Cours extérieurs au programme
8 credits academic year French

TEMP-0000 (optional) Cours extérieurs au programme
9 credits academic year French

TEMP-0000 (optional) Cours extérieurs au programme
10 credits academic year French

Master in Chemistry
Focus Teaching

One fundamental goal of the Master in Chemistry is to give students a deep understanding of the basic concepts used in chemical sciences, and how they interact. The programme places emphasis on teaching autonomy, with personal projects and a Master's dissertation to be defended at the end of the second year.

The curriculum includes both theoretical and practical teachings. Six series of lectures must be chosen amongst the seven following:

- Polymer chemistry
- Macroscopic physical chemistry: from self-assembling to self-organisation,
- Strategies for organic synthesis,
- Computational approaches to the states of matter,
- Chemistry of interfaces and nanostructures,
- Chemistry and structure of biological macromolecules,
- Environmental chemistry and chemical risks.

Students also choose a number of elective courses in a field of interest, and complete a research-oriented dissertation in the second year, working within one of the department's research units.

Bloc 1 | M-CHIMD | MA-CHIM

Module 1: Cours de base

Four courses chosen from the following

CHIM-F406 (optional) — Chimie des polymères | Yves GEERTS (Coordinator) and Olivier DEBEVER
5 credits [lecture: 36h, tutorial classes: 12h] first term French

CHIM-F408 (optional) — Chimie physique macroscopique: de l'auto-assemblage à l'auto-organisation | Anne DE WIT (Coordinator) and Laurence RONGY
5 credits [lecture: 36h, tutorial classes: 24h] first term French

CHIM-F436 (optional) — Stratégies de synthèse organique | Gwilherm EVANO (Coordinator) and Cédric Theunissen
5 credits [lecture: 36h, practical work: 24h, project: 40h] first term French

CHIM-F443 (optional) — Approches computationnelles des états de la matière | Nathalie VAECK (Coordinator), Antoine Aerts, Emilie CAUET and Martine PREVOST
5 credits [practical work: 36h, project: 24h] first term French

CHIM-F466 (optional) — Chimie et structure des macromolécules biologiques | Vincent RAUSSENS (Coordinator), Cédric GOVAERTS and Chloé MARTENS
5 credits [lecture: 36h, tutorial classes: 24h] first term French

CHIM-F467 (optional) — Chimie des interfaces et nanostructures | Thomas DONEUX (Coordinator), François RENIERS, Jon USTARROZ TROYANO and Thierry VISART DE BOCARME
5 credits [lecture: 36h, practical work: 24h, project: 24h] first term French

CHIM-F474 (optional) — Chimie de l'environnement et risques chimiques | Pierre-François COHEUR (Coordinator) and Laurence RONGY
5 credits [lecture: 36h, tutorial classes: 12h, practical work: 12h] first term French

Module 2: Enseignements obligatoires

CHIM-F451 — Didactique de la chimie | Cécile MOUCHERON (Coordinator)
5 credits [lecture: 24h, tutorial classes: 24h, project: 30h] first term French

PEDA-E510 Pédagogie et didactique, aspects généraux | Thomas BARRIER (Coordinator), Maud Delepière and Nathanaël FRIANT
5 credits [lecture: 60h] first term French

STAG-F005 Stages et pratique réflexive I | Cécile MOUCHERON (Coordinator) and Sophie Bauduin
5 credits [seminars: 12h, project: 80h, work placement: 48h] first and second terms French

Module 3: Cours à option

5 cours de 5 crédits à choisir parmi les deux enseignements suivants et/ou parmi les cours à options du module 4 ou, moyennant accord du Jury et avec un maximum de 10 crédits pour le cycle, parmi les cours d'une autre finalité du Master en sciences chimiques ou encore dans un autre Master d'une université de la fédération Wallonie-Bruxelles. Un cours de base non suivi du module 1 peut être l'un de ces cours à option.

Up to ten credits chosen from the following

STAG-F006 (optional) Préparation au stage en école | Cécile MOUCHERON (Coordinator)
5 credits [work placement: 48h] second term French

STAG-F007 (optional) Préparation à la pratique enseignante | Cécile MOUCHERON (Coordinator)
5 credits [work placement: 48h] second term French

Module 4: Cours à option

Up to 25 credits chosen from the following

BING-F4007 (optional) Compléments de biochimie et de microbiologie | Sigrid FLAHAUT (Coordinator) and Nausicaa NORET
5 credits [lecture: 48h, practical work: 12h] second term French

CHIM-F4001 (optional) Rational drug design and PKPD modeling | Jean-Christophe LELOUP (Coordinator) and Martine PREVOST
5 credits [lecture: 36h, tutorial classes: 12h, project: 24h] second term English

CHIM-F401 (optional) Chimie physique moléculaire : structure, spectroscopie et dynamique | Nathalie VAECK (Coordinator), Antoine Aerts, Emilie CAUET and Jean VANDER AUWERA
5 credits [lecture: 12h, practical work: 24h, project: 24h] second term French

CHIM-F402 (optional) Catalyse | Thierry VISART DE BOCARME (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h, project: 12h] second term French

CHIM-F405 (optional) Photophysique des atmosphères et des milieux interstellaires | Nathalie VAECK (Coordinator), Sophie Bauduin and Lieven CLARISSE
5 credits [lecture: 36h, project: 12h] second term English/French

CHIM-F407 (optional) Dynamiques non linéaires et instabilités de non-équilibre | Anne DE WIT (Coordinator) and Laurence RONGY
5 credits [lecture: 36h, project: 24h] second term French

CHIM-F415 (optional) Electrochimie : Concepts, Techniques et Applications | Thomas DONEUX (Coordinator) and Jon USTARROZ TROYANO
5 credits [lecture: 36h, tutorial classes: 12h, project: 12h] second term English/French

CHIM-F418 (optional) Chimie supramoléculaire - Récepteurs moléculaires synthétiques | Ivan JABIN (Coordinator) and Michel LUHMER
5 credits [lecture: 36h, practical work: 12h, project: 30h] second term French

CHIM-F419 (optional) Chimie physique des mileux dilués | Jean VANDER AUWERA (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h] second term French

CHIM-F422 (optional) Modélisation des rythmes du vivant | Didier GONZE (Coordinator), Geneviève DUPONT and Jean-Christophe LELOUP
5 credits [lecture: 24h, tutorial classes: 24h, project: 30h] second term French

CHIM-F423 (optional) Photochimie des composés organiques, inorganiques et organométalliques | Cécile MOUCHERON (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h, project: 30h] second term French

CHIM-F425 (optional) Plasma chemistry and physics | François RENIERS (Coordinator)
5 credits [lecture: 24h, tutorial classes: 12h] second term French

CHIM-F430 (optional) Chimie et catalyse organométalliques | Gwilherm EVANO (Coordinator) and Cédric Theunissen
5 credits [lecture: 42h, tutorial classes: 6h] second term French

CHIM-F433 (optional) Interactions supramoléculaires | Yves GEERTS (Coordinator)
5 credits [lecture: 24h, tutorial classes: 24h] second term French

CHIM-F434 (optional) Synthèse de biomolécules et introduction à la chimie médicinale | Gwilherm EVANO (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h] second term French

CHIM-F438 (optional) Surface analysis of materials | François RENIERS (Coordinator) and Herman TERRYN
5 credits [lecture: 24h, tutorial classes: 12h] second term English

CHIM-F440 (optional) Spectroscopie et modélisation des protéines | Vincent RAUSSENS (Coordinator), Martine PREVOST and Jehan Waeytens
5 credits [lecture: 36h, tutorial classes: 24h] second term French

CHIM-F457 (optional) Résonance magnétique nucléaire | Michel LUHMER (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h] second term French

CHIM-F460 (optional) Modélisation et analyse des systèmes stochastiques complexes | Yannick DE DECKER (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h] second term French

ENVI-F451 (optional) Télédétection des variables climatiques et environnementales | Pierre-François COHEUR (Coordinator), Sophie Bauduin and Lieven CLARISSE
5 credits [lecture: 36h, project: 40h] second term English/French

ENVI-F526 (optional) Sciences de l'atmosphère et changements climatiques | Pierre-François COHEUR (Coordinator) and Cathy CLERBAUX
5 credits [lecture: 36h, project: 24h] second term French

ENVI-F527 (optional) Matière et énergie dans l'environnement: analyse, transport et instabilités | François FRIPIAT (Coordinator) and Anne DE WIT
5 credits [lecture: 36h, practical work: 24h] second term French

One course chosen from the following

TEMP-0000 (optional) Cours extérieurs au programme
5 credits academic year French

TEMP-0000 (optional) Cours extérieurs au programme
6 credits academic year French

TEMP-0000 (optional) Cours extérieurs au programme
7 credits academic year French

TEMP-0000 (optional) Cours extérieurs au programme
8 credits academic year French

TEMP-0000 (optional) Cours extérieurs au programme
9 credits academic year French

TEMP-0000 (optional) Cours extérieurs au programme
10 credits academic year French

Master in Chemistry
Focus Teaching

Bloc 2 | M-CHIMD | MA-CHIM

Tronc commun

L'accès au mémoire est conditionné à la réussite préalable d'au moins 30 crédits du programme de master.

MEMO-F532 — Mémoire | Gwilherm EVANO (Coordinator)
30 credits [project: 304h, mfe/tfe: 496h] | first and second terms

Module 1: Cours de base

Two courses chosen from the following

CHIM-F406 (optional) — Chimie des polymères | Yves GEERTS (Coordinator) and Olivier DEBEVER
5 credits [lecture: 36h, tutorial classes: 12h] | first term | French

CHIM-F408 (optional) — Chimie physique macroscopique: de l'auto-assemblage à l'auto-organisation | Anne DE WIT (Coordinator) and Laurence RONGY
5 credits [lecture: 36h, tutorial classes: 24h] | first term | French

CHIM-F436 (optional) — Stratégies de synthèse organique | Gwilherm EVANO (Coordinator) and Cédric Theunissen
5 credits [lecture: 36h, practical work: 24h, project: 40h] | first term | French

CHIM-F443 (optional) — Approches computationnelles des états de la matière | Nathalie VAECK (Coordinator), Antoine Aerts, Emilie CAUET and Martine PREVOST
5 credits [practical work: 36h, project: 24h] | first term | French

CHIM-F466 (optional) — Chimie et structure des macromolécules biologiques | Vincent RAUSSENS (Coordinator), Cédric GOVAERTS and Chloé MARTENS
5 credits [lecture: 36h, tutorial classes: 24h] | first term | French

CHIM-F467 (optional) — Chimie des interfaces et nanostructures | Thomas DONEUX (Coordinator), François RENIERS, Jon USTARROZ TROYANO and Thierry VISART DE BOCARME
5 credits [lecture: 36h, practical work: 24h, project: 24h] | first term | French

CHIM-F474 (optional) — Chimie de l'environnement et risques chimiques | Pierre-François COHEUR (Coordinator) and Laurence RONGY
5 credits [lecture: 36h, tutorial classes: 12h, practical work: 12h] | first term | French

Module 2: Enseignements obligatoires

EDUC-E520 — Aspects socio-historiques, psychologiques, culturels, éthiques et de neutralité de l'enseignement | Jose-Luis WOLFS (Coordinator), Sylviane BACHY, Camille Tilleul and Philippe VIENNE
5 credits [lecture: 60h] | first and second terms | French

STAG-F008 — Stages et pratique réflexive II | Cécile MOUCHERON (Coordinator) and Sophie Bauduin
10 credits [seminars: 12h, project: 80h, work placement: 96h] | first and second terms | French

Module 3: Cours à option

1 cours de 5 crédits à choisir parmi la liste du module 4 du bloc 1 ou, moyennant accord du Jury et avec un maximum de 10 crédits pour le cycle, parmi les cours d'une autre finalité du Master en sciences chimiques ou encore dans un autre Master d'une université de la fédération Wallonie-Bruxelles. Le cours de base non suivi du module 1 peut être un de ces cours à option.

TEMP-0000 Cours extérieurs au programme

5 credits academic year French

Master in Chemistry
Focus Professional

One fundamental goal of the Master in Chemistry is to give students a deep understanding of the basic concepts used in chemical sciences, and how they interact. The programme places emphasis on teaching autonomy, with personal projects and a Master's dissertation to be defended at the end of the second year.

The curriculum includes both theoretical and practical teachings. Six series of lectures must be chosen amongst the seven following:

- Polymer chemistry
- Macroscopic physical chemistry: from self-assembling to self-organisation,
- Strategies for organic synthesis,
- Computational approaches to the states of matter,
- Chemistry of interfaces and nanostructures,
- Chemistry and structure of biological macromolecules,
- Environmental chemistry and chemical risks.

Students also choose a number of elective courses in a field of interest, and complete a research-oriented dissertation in the second year, working within one of the department's research units.

Bloc 1 | M-CHIMS | MA-CHIM

Module 1: Cours de base

Six courses chosen from the following

CHIM-F406 (optional) — Chimie des polymères | Yves GEERTS (Coordinator) and Olivier DEBEVER
5 credits [lecture: 36h, tutorial classes: 12h] first term French

CHIM-F408 (optional) — Chimie physique macroscopique: de l'auto-assemblage à l'auto-organisation | Anne DE WIT (Coordinator) and Laurence RONGY
5 credits [lecture: 36h, tutorial classes: 24h] first term French

CHIM-F436 (optional) — Stratégies de synthèse organique | Gwilherm EVANO (Coordinator) and Cédric Theunissen
5 credits [lecture: 36h, practical work: 24h, project: 40h] first term French

CHIM-F443 (optional) — Approches computationnelles des états de la matière | Nathalie VAECK (Coordinator), Antoine Aerts, Emilie CAUET and Martine PREVOST
5 credits [practical work: 36h, project: 24h] first term French

CHIM-F466 (optional) — Chimie et structure des macromolécules biologiques | Vincent RAUSSENS (Coordinator), Cédric GOVAERTS and Chloé MARTENS
5 credits [lecture: 36h, tutorial classes: 24h] first term French

CHIM-F467 (optional) — Chimie des interfaces et nanostructures | Thomas DONEUX (Coordinator), François RENIERS, Jon USTARROZ TROYANO and Thierry VISART DE BOCARME
5 credits [lecture: 36h, practical work: 24h, project: 24h] first term French

CHIM-F474 (optional) — Chimie de l'environnement et risques chimiques | Pierre-François COHEUR (Coordinator) and Laurence RONGY
5 credits [lecture: 36h, tutorial classes: 12h, practical work: 12h] first term French

Module 2: Cours obligatoire

Ce cours peut être suivi en bloc 2

CHIM-F417 L'industrie chimique | Jean-Paul LECOMTE (Coordinator) and David PIERRE
5 credits [lecture: 24h, tutorial classes: 24h] second term French

Module 3: Stage industriel obligatoire

Choisir un stage de 15 ou 25 crédits. Le stage peut être suivi en bloc 2.

Sauf dérogation accordée par le jury, l'accès au stage est conditionné à la réussite préalable d'au moins 15 crédits du programme de Master. Les données et résultats expérimentaux/théoriques du stage doivent être différents de ceux du mémoire.

One course chosen from the following

One course chosen from the following

STAG-F004 (optional) Stages | Ivan JABIN (Coordinator)
15 credits [project: 80h, work placement: 312h] first and second terms French

STAG-F004 (optional) Stages | Ivan JABIN (Coordinator)
25 credits [project: 80h, work placement: 507h] first and second terms French

Module 4: Cours à option

Si le stage du Module 3 compte pour 15 crédits, choisir obligatoirement 10 crédits de cours à options parmi la liste suivante:

Up to ten credits chosen from the following

CHIM-H314 (optional) Introduction au génie des procédés | Benoît HAUT (Coordinator)
5 credits [lecture: 24h, tutorial classes: 24h, practical work: 12h] second term French

DROI-C5169 (optional) Sciences forensiques | Anne LERICHE (Coordinator)
5 credits [lecture: 24h] first term French

GEST-H501 (optional) Logistics Engineering and Management | Alassane Ballé NDIAYE (Coordinator)
5 credits [lecture: 12h, tutorial classes: 36h] first term English

GEST-S307 (optional) Theory of innovation and entrepreneurship (Solvay Chair of Innovation) | Bruno VAN POTTELSBERGHE (Coordinator) and Olivier WITMEUR
5 credits [lecture: 24h, practical work: 24h] second term English

Groupe de cours 1

One course chosen from the following

GEST-S101 (optional) Comptabilité financière | Gilles GEVERS (Coordinator) and Laurent GHEERAERT
5 credits [lecture: 36h, tutorial classes: 8h] second term French

Groupe de cours 2

One course chosen from the following

DROI-C5124 (optional) Droits d'auteur et droits voisins | Carine DOUTRELEPONT (Coordinator)
5 credits [lecture: 24h] first term French

DROI-C5126 (optional) Droit des inventions et du design | Andrée PUTTEMANS (Coordinator)
5 credits [lecture: 24h] first term French
Cours dispensé un an sur deux.

Module 5 : Cours à option

5 cours de 5 crédits à choisir dans la liste ci-dessous ou, moyennant accord du Jury et avec un maximum de 10 crédits pour le cycle, parmi les cours d'une autre finalité du Master en sciences chimiques ouencore dans un autre Master d'une université de la fédération Wallonie-Bruxelles.Le cours de base non suivi du module 1 peut être un de ces cours à option.

15 to 30 credits chosen from the following

BING-F4007 (optional) Compléments de biochimie et de microbiologie | Sigrid FLAHAUT (Coordinator) and Nausicaa NORET
5 credits [lecture: 48h, practical work: 12h] second term French

CHIM-F4001 (optional) Rational drug design and PKPD modeling | Jean-Christophe LELOUP (Coordinator) and Martine PREVOST
5 credits [lecture: 36h, tutorial classes: 12h, project: 24h] second term English

CHIM-F401 (optional) Chimie physique moléculaire : structure, spectroscopie et dynamique | Nathalie VAECK (Coordinator), Antoine Aerts, Emilie CAUET and Jean VANDER AUWERA
5 credits [lecture: 12h, practical work: 24h, project: 24h] second term French

CHIM-F402 (optional) Catalyse | Thierry VISART DE BOCARME (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h, project: 12h] second term French

CHIM-F405 (optional) Photophysique des atmosphères et des milieux interstellaires | Nathalie VAECK (Coordinator), Sophie Bauduin and Lieven CLARISSE
5 credits [lecture: 36h, project: 12h] second term English/French

CHIM-F407 (optional) Dynamiques non linéaires et instabilités de non-équilibre | Anne DE WIT (Coordinator) and Laurence RONGY
5 credits [lecture: 36h, project: 24h] second term French

CHIM-F415 (optional) Electrochimie : Concepts, Techniques et Applications | Thomas DONEUX (Coordinator) and Jon USTARROZ TROYANO
5 credits [lecture: 36h, tutorial classes: 12h, project: 12h] second term English/French

CHIM-F418 (optional) Chimie supramoléculaire - Récepteurs moléculaires synthétiques | Ivan JABIN (Coordinator) and Michel LUHMER
5 credits [lecture: 36h, practical work: 12h, project: 30h] second term French

CHIM-F419 (optional) Chimie physique des mileux dilués | Jean VANDER AUWERA (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h] second term French

CHIM-F422 (optional) Modélisation des rythmes du vivant | Didier GONZE (Coordinator), Geneviève DUPONT and Jean-Christophe LELOUP
5 credits [lecture: 24h, tutorial classes: 24h, project: 30h] second term French

CHIM-F423 (optional) Photochimie des composés organiques, inorganiques et organométalliques | Cécile MOUCHERON (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h, project: 30h] second term French

CHIM-F425 (optional) Plasma chemistry and physics | François RENIERS (Coordinator)
5 credits [lecture: 24h, tutorial classes: 12h] second term French

CHIM-F430 (optional) Chimie et catalyse organométalliques | Gwilherm EVANO (Coordinator) and Cédric Theunissen
5 credits [lecture: 42h, tutorial classes: 6h] second term French

CHIM-F433 (optional) Interactions supramoléculaires | Yves GEERTS (Coordinator)
5 credits [lecture: 24h, tutorial classes: 24h] second term French

CHIM-F434 (optional) Synthèse de biomolécules et introduction à la chimie médicinale | Gwilherm EVANO (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h] second term French

CHIM-F438 (optional) — Surface analysis of materials | François RENIERS (Coordinator) and Herman TERRYN
5 credits [lecture: 24h, tutorial classes: 12h] second term English

CHIM-F440 (optional) — Spectroscopie et modélisation des protéines | Vincent RAUSSENS (Coordinator), Martine PREVOST and Jehan Waeytens
5 credits [lecture: 36h, tutorial classes: 24h] second term French

CHIM-F457 (optional) — Résonance magnétique nucléaire | Michel LUHMER (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h] second term French

CHIM-F460 (optional) — Modélisation et analyse des systèmes stochastiques complexes | Yannick DE DECKER (Coordinator)
5 credits [lecture: 36h, tutorial classes: 12h] second term French

ENVI-F451 (optional) — Télédétection des variables climatiques et environnementales | Pierre-François COHEUR (Coordinator), Sophie Bauduin and Lieven CLARISSE
5 credits [lecture: 36h, project: 40h] second term English/French

ENVI-F526 (optional) — Sciences de l'atmosphère et changements climatiques | Pierre-François COHEUR (Coordinator) and Cathy CLERBAUX
5 credits [lecture: 36h, project: 24h] second term French

ENVI-F527 (optional) — Matière et énergie dans l'environnement: analyse, transport et instabilités | François FRIPIAT (Coordinator) and Anne DE WIT
5 credits [lecture: 36h, practical work: 24h] second term French

One course chosen from the following

TEMP-0000 (optional) — Cours extérieurs au programme
5 credits academic year French

TEMP-0000 (optional) — Cours extérieurs au programme
10 credits academic year French

Master in Chemistry
Focus Professional

Bloc 2 | M-CHIMS | MA-CHIM

Tronc commun

L'accès au mémoire est conditionné à la réussite préalable d'au moins 30 crédits du programme de master.

MEMO-F533 Mémoire | Gwilherm EVANO (Coordinator)
30 credits [project: 304h, mfe/tfe: 496h] first and second terms

Module 1: Cours obligatoire

Ce cours peut-être suivi dans le bloc 1

CHIM-F417 L'industrie chimique | Jean-Paul LECOMTE (Coordinator) and David PIERRE
5 credits [lecture: 24h, tutorial classes: 24h] second term French

Module 2 :Stage industriel obligatoire (si non suivi en bloc 1)

Choisir un stage de 15 ou 25 crédits. Le stage peut être suivi en bloc 1. Sauf dérogation accordée par le jury, l'accès au stage est conditionné à la réussite préalable d'au moins 15 crédits du programme de Master. Les données et résultats expérimentaux/théoriques du stage doivent être différents de ceux du mémoire.

15 to 25 credits chosen from the following

One course chosen from the following

STAG-F004 (optional) Stages | Ivan JABIN (Coordinator)
15 credits [project: 80h, work placement: 312h] first and second terms French

STAG-F004 (optional) Stages | Ivan JABIN (Coordinator)
25 credits [project: 80h, work placement: 507h] first and second terms French

Module 3: Cours à option

Choisir un complément de cours à option pour arriver à un total de 60 crédits parmi les cours ci-dessous ou parmi les options proposées dans le module 5 du bloc 1 ou, moyennant accord du Jury et avec unmaximum de 10 crédits pour le cycle, parmi les cours d'une autre finalité du Master en sciences chimiques ou encore dans un autre Master d'une université de la fédération Wallonie-Bruxelles. Le cours de base non suivi du module 1 du bloc 1 peut être un de ces cours à option.Si le stage compte pour 15 crédits, choisir obligatoirement 10 crédits de cours à options parmi la liste suivante:

A total of ten credits chosen from the following

CHIM-H314 (optional) Introduction au génie des procédés | Benoît HAUT (Coordinator)
5 credits [lecture: 24h, tutorial classes: 24h, practical work: 12h] second term French

DROI-C5169 (optional) — Sciences forensiques | Anne LERICHE (Coordinator)
5 credits [lecture: 24h] first term French

GEST-H501 (optional) — Logistics Engineering and Management | Alassane Ballé NDIAYE (Coordinator)
5 credits [lecture: 12h, tutorial classes: 36h] first term English

GEST-S307 (optional) — Theory of innovation and entrepreneurship (Solvay Chair of Innovation) | Bruno VAN POTTELSBERGHE (Coordinator) and Olivier WITMEUR
5 credits [lecture: 24h, practical work: 24h] second term English

Groupe de cours 1

GEST-S101 (optional) — Comptabilité financière | Gilles GEVERS (Coordinator) and Laurent GHEERAERT
5 credits [lecture: 36h, tutorial classes: 8h] second term French

Groupe de cours 2

DROI-C5124 (optional) — Droits d'auteur et droits voisins | Carine DOUTRELEPONT (Coordinator)
5 credits [lecture: 24h] first term French

DROI-C5126 (optional) — Droit des inventions et du design | Andrée PUTTEMANS (Coordinator)
5 credits [lecture: 24h] first term French
Cours dispensé un an sur deux.

One course chosen from the following

TEMP-0000 (optional) — Cours extérieurs au programme
5 credits academic year French

TEMP-0000 (optional) — Cours extérieurs au programme
6 credits academic year French

TEMP-0000 (optional) — Cours extérieurs au programme
7 credits academic year French

TEMP-0000 (optional) — Cours extérieurs au programme
8 credits academic year French

TEMP-0000 (optional) — Cours extérieurs au programme
9 credits academic year French

TEMP-0000 (optional) — Cours extérieurs au programme
10 credits academic year French