

KIMA2M - Introduction

Introduction

Introduction

In order to meet essential challenges such as energy management, communication and information, sustainable development and climate change, it is essential to foster scientific and technological creativity in the field of industrial materials and processes.

You

- have acquired solid knowledge of chemical or physical engineering and mathematics;
- are interested in research and development as well as production and management in cutting edge industries: chemistry, metals and materials, metallic products, plastics, electronics or the process industry;
- would like to take advantage of the most recent research advances in your area of specialisation.

Your future job

Jobs in chemical and materials engineering range from research and development to production and marketing.

You can become :

- A « systems » engineer :

Who designs new products or devices with specific properties or functions, e.g. a mitral valve, an electroluminescent polymer for a flexible display, a metallic alloy or a light composite for aerospace applications, a nanomaterial usable for memory storage.

- A « process » engineer :

Who develops new production processes or manages the operation of production units, e.g. a plastics extrusion line, a factory for the extraction of a pharmaceutical compounds from a given plant l, a water or waste treatment plant, a production line for electronic components, a production unit for a high purity chemical compound, etc.

- A combination of both :

For instance, you develop a polymer material for the automotive industry and the synthesis/compounding process required for its industrial scale up.

Your programme

The master offers:

- a specialised training in an international environment; from 2015-2016, all courses organized by the programme commission (i.e. courses with LMAPR2xxx designation) are taught in English ; assistance provided as needed to French-speaking students ("French-friendly" approach).
- an interdisciplinary approach to problem solving, rooted in physics and chemistry;
- research-based training : integration of students in experimental laboratories, research projects ;
- exposure to industry : factory visits, industry internships, graduation project in a company ;
- the possibility to obtain a dual degree if you are accepted in the Master's degree programme "Functionalised Advanced Materials & Engineering" (FAME), part of the Erasmus Mundus programme. It is entirely in English and starts with a year of general training either at the National Polytechnic Institute of Grenoble (France) or at the University of Augsburg (Germany); in the second year, students specialise in a field of materials sciences at one of 7 partner universities. UCLouvain offers a specialisation in materials and nano-structures engineering. Upon completing the programme, students are granted a dual Master's degree. More information available on the [web page](#).

5.5 Draft documents that take into account demands and conventions of the field.

5.6 Make a convincing oral presentation possibly using modern communication techniques.

CORE COURSES [27.0]

- Mandatory
- ⊗ Optional
- △ Not offered in 2024-2025
- ⊙ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
- △ ⊕ Not offered in 2024-2025 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫 Not open to incoming exchange students
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

Click on the course title to see detailed informations (objectives, methods, evaluation...)

		Year	
		1	2
○ LKIMA2990	Graduation project/End of studies project <i>The graduation project can be written and presented in French or English, in consultation with the supervisor. It may be accessible to exchange students by prior agreement between the supervisors and/or the two universities.</i>	EN [q1+q2] [] [25 Credits] 🌐 > French-friendly	x
○ LEPL2020	Professional integration work <i>The modules of LEPL2020 course are organized over the two annual blocks of the master's degree. It is strongly recommended that students take them from year 1, but they will only be able to register for the course at the earliest the year in which they present</i>		

PROFESSIONAL FOCUS [30.0]

- Mandatory
- ⊗ Optional
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Year

1 2

o Content:

○ LMAPR2001	Project "chemical & materials engineering for a sustainable future"	Juray De Wilde Pascal Jacques Alain Jonas Patricia Luis Alconero Samuel Poncé	EN [q2] [45h+60h] [10 Credits] 🌐 > French-friendly	X	X
○ LMAPR2013	Science and engineering of metals and ceramics	Pascal Jacques	EN [q1] [30h+30h] [5 Credits] 🌐 > French-friendly	X	X
○ LMAPR2019	Polymer Science and Engineering	Sophie Demoustier Alain Jonas Evelyne Van Ruymbeke	EN [q1] [45h+15h] [5 Credits] 🌐 > French-friendly	X	X
○ LMAPR2231	Metallurgical and electrochemical processes	Joris Proost	EN [q2] [30h+22.5h] [5 Credits] 🌐 > French-friendly	X	X
○ LMAPR2430	Industrial processes for the production of base chemicals	Juray De Wilde	EN [q1] [30h+22.5h] [5 Credits] 🌐 > French-friendly	X	X

OPTIONS

Dans la rubrique "Options du master ingénieur civil en chimie et science des matériaux", l'étudiant-e doit valider au moins une des options proposées.

Dans la rubrique "Options et cours au choix en connaissances socioéconomiques", l'étudiant-e valide une des deux options ou choisit obligatoirement au minimum 3 crédits parmi les cours au choix ou les cours de l'option en enjeux de l'entreprise.

Major in chemical and materials

- > Major in chemical engineering [en-prog-2024-kima2m-lkima221o]
- > Major in materials science and engineering [en-prog-2024-kima2m-lkima222o]
- > Cours au choix disciplinaires [en-prog-2024-kima2m-lkima237o]

Options et cours au choix en connaissances socio-économiques

- > Business risks and opportunities [en-prog-2024-kima2m-lkima235o]
- > Major in Interdisciplinary Program in Entrepreneurship - INEO [en-prog-2024-kima2m-lkima236o]
- > Cours au choix en connaissances socio-économiques [en-prog-2024-kima2m-lkima200o]

Others elective courses

- > Other elective courses [en-prog-2024-kima2m-lkima952o]

MAJOR IN CHEMICAL AND MATERIALS

MAJOR IN CHEMICAL ENGINEERING [15.0]

- Mandatory
 - ✘ Optional
 - △
-

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o Cours au choix disciplinaires

o Cours au choix disciplinaires en génie des matériaux

⊗ LMAPR2016	Project in Polymer Science	Charles-André Fustin Alain Jonas	FR [q2] [30h+15h] [5 Credits] 🌐 > French-friendly	X	X
⊗ LCHM2261	Polymer Chemistry and Physical Chemistry	Charles-André Fustin Jean-François Gohy Alain Jonas	FR [q1] [45h+15h] [5 Credits] 🌐 > French-friendly	X	X
⊗ LMAPR2018	Rheology	Evelyne Van Ruymbeke	FR [q2] [30h+30h] [5 Credits] 🌐 > French-friendly	X	X
⊗ LMAPR2420	Sustainable metallurgy	Pascal Jacques	EN [q2] [30h+30h] [5 Credits] 🌐 > French-friendly	X	X
⊗ LMAPR2672	Materials for Extreme Environments	Jean-Pierre Erauw Pascal Jacques	EN [q2] [30h+30h] [5 Credits] ⊕ 🌐 > French-friendly	X	X
⊗ LMECA2860	Welding Science and Technology	Pascal Jacques Aude Simar	FR [q1] [30h+30h] [5 Credits] 🌐 > French-friendly	X	X
⊗ LMAPR2141	Metals Processing and Recycling	Philippe Henry Joris Proost	EN [q2] [30h+30h] [5 Credits] ⊕ 🌐 > French-friendly	X	X
⊗ LMECA2640	Mechanics of composite materials	Issam Doghri	FR [q2] [30h+30h] [5 Credits] 🌐 > French-friendly	X	X
⊗ LMECA2520	Calculation of planar structures	Issam Doghri	FR [q2] [30h+30h] [5 Credits] 🌐 > French-friendly	X	X
⊗ LGCIV1022	Mechanics of structures	Pierre Latteur	FR [q2] [30h+30h] [5 Credits] 🌐		



MAJOR IN INTERDISCIPLINARY PROGRAM IN ENTREPRENEURSHIP - INEO

Commune à la plupart des masters de l'EPL, cette option a pour objectif de familiariser l'étudiant-e avec les spécificités de l'entrepreneuriat et de la création d'entreprise afin de développer chez lui les aptitudes, connaissances et outils nécessaires à la création d'entreprise.

Cette option rassemble des étudiants de différentes facultés en équipes interdisciplinaires afin de créer un projet entrepreneurial. La formation interdisciplinaire en entrepreneuriat (INEO) est une option qui s'étend sur 2 ans et s'intègre dans plus de 30 Masters de 9 facultés/écoles de l'UCLouvain. Le choix de l'option INEO implique la réalisation d'un mémoire interfacultaire (en équipe) portant sur un projet de création d'entreprise. L'accès à cette option, ainsi qu'à chacun des cours, est limité aux étudiant-es sélectionnés sur dossier. Toutes les informations sur <https://uclouvain.be/fr/etudier/ineo>.

L'étudiant.e qui choisit de valider cette option doit sélectionner au minimum 20 crédits et au maximum 25 crédits. Cette option n'est pas accessible en anglais et ne peut être prise simultanément avec l'option « Enjeux de l'entreprise ».

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Year

1 2

Content:

Required courses

● LINEO2001	Théorie de l'entrepreneuriat	Frank Janssen	(FR) [q1] [30h+20h] [5 Credits] 🌐	x
● LINEO2002	Aspects juridiques, économiques et managériaux de la			

COURS AU CHOIX EN CONNAISSANCES SOCIO-ÉCONOMIQUES

- Mandatory
 - ✘ Optional
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 - ⊕ Offered in 2024-2025 but not the following year
 - △ ⊕
-

Course prerequisites

There are no prerequisites between course units (CUs) for this programme, i.e. the programme activity (course unit, CU) whose learning outcomes are to be certified and the corresponding credits awarded by the jury before registration in another CU.

The programme's courses and learning outcomes

For each UCLouvain training programme, a [reference framework of learning outcomes](#) specifies the skills expected of every graduate on completion of the programme. Course unit descriptions specify targeted learning outcomes, as well as the unit's contribution to reference framework of learning outcomes.

KIMA2M - Information

Access Requirements

Master course admission requirements are defined by the French Community of Belgium Decree of 7 November 2013 defining the higher education landscape and the academic organisation of courses.

General and specific admission requirements for this programme must be satisfied at the time of enrolling at the university.

Unless explicitly mentioned, the bachelor's, master's and licentiate degrees listed in this table or on this page are to be understood as those issued by an institution of the French, Flemish or German-speaking Community, or by the Royal Military Academy.

In the event of the divergence between the different linguistic versions of the present conditions, the French version shall prevail.

SUMMARY

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	For others institutions

degree may have an adapted master programme.

Teaching method

A variety of teaching methods

The teaching methods used in the Master's degree programme in chemical and materials engineering are in keeping with those used in the Bachelor's degree programme in engineering sciences: active learning, an equal mix of group work and individual work, and emphasis on the development of non-technical skills. An important characteristic of the programme is the immersion of students in the research laboratories of the professors who teach in the programme (lab work, case studies, projects and theses), which allows students to learn cutting edge methods used in their field and to learn from the questioning process inherent in research. In addition, there is an optional 10 credit internship carried out over at least 9 months in a research centre or company that allows motivated students to get experience in the professional world.

Diverse learning situations

Students are exposed to a variety of pedagogies: lectures, projects, exercise and problem-solving sessions, case studies, experimental laboratories, computer simulations, educational software, internships in industry or research, factory visits, graduation trips, individual or group work, seminars given by visiting scientists. This variety of pedagogies helps students to build their knowledge in an iterative and progressive manner all the while developing their independence, organisational and time management skills as well as their ability to communicate.

Interdisciplinary Methods

The Master's degree in chemical and materials engineering is by its very nature interdisciplinary because it serves as an interface between chemistry and physics. It has an interdisciplinary foundation, which provides students with an introduction to the large array of applications used in applied physics and chemistry and training through practical work and cutting edge research as well as major courses in chemistry and material technologies: polymers and macromolecules, inorganic materials and processes, materials mechanics, chemical engineering, nanotechnologies and environmentalism and sustainable development. The programme is open to biotechnology with majors in biomaterials and bioprocesses as well as to business management with majors in management and small and medium sized business creation. The programme is composed of a significant number of classes such as PHYS (or PHY), CHIM (or CHM), BIOL, INMA, MECA, ELEC, BRNA and BIR, which shows that the programme is open and interdisciplinary. Finally, the programme allows students to select up to 40 credits of elective courses from the medical and science programmes and up to 6 credits of classes in the humanities and social sciences, which allow students to create a personalised programme of study.

Evaluation

The evaluation methods comply with the [regulations concerning studies and exams](#). More detailed explanation of the modalities specific to each learning unit are available on their description sheets under the heading "Learning outcomes evaluation method".

Student work is evaluated according to University rules (see the rules for evaluating coursework and exams) namely written and oral exams, laboratory exams, individual or group work, public presentations of projects and theses defences. Details about evaluation methods for each teaching unit are explained by the professors at the beginning of the semester.

For more information on evaluation methods, students may consult the relevant evaluation descriptions.

Mobility and/or Internationalisation outlook

Over the years, EPL has developed over a hundred partnerships with partners in more than 36 countries (EU and non-EU) to offer exchange programmes to its students. We also offer the possibility of obtaining Double degrees, Joint Degrees or Dual Masters in several fields. The EPL is currently participating in two Erasmus Mundus programmes: [FAME](#) and [STRAINS](#).

In addition to exchange programmes under the Erasmus+ programme, numerous agreements have been established with a wide range of universities through various partner networks such as:

- [TIME](#) network (Top Industrial Managers in Europe).
- [CLUSTER](#) network
- [Magalhães](#) network
- [Circle U](#). network through several networks and European University Alliance

So, there's no shortage of opportunities to gain an additional qualification and/or spend part of the year abroad during your two-year Master's degree! It's the perfect opportunity to discover or improve your knowledge of a foreign language, tackle subjects from a new angle and gain unique experience in Europe or the rest of the world.

If you would like more information, please visit the dedicated pages of the [EPL International Office](#) to discover all the destinations, testimonials from former students and all the procedures to follow to make these opportunities a success.

Louvain School of Engineering takes part in Erasmus Mundus Joint Master degree program: [FAME](#)

The Erasmus Mundus joint master "Functional Advanced Materials & Engineering"- FAME, is an international program spread over Belgium, Germany, France and Portugal. Within the mobility scheme of FAME, students spend a first year either at the Technical University of Darmstadt or at the Institute National Polytechnique de Grenoble.

All classes are taught, in English. The second year of the master is then followed in one of the remaining seven partner Universities. In

