GCE2M - Introduction

Introduction

Introduction

Upon completion of this Master's degree programme, students will have mastered the principles and mathematical methods central to civil and environmental engineering: construction, hydraulics, geotechnology, structures and materials. Moreover, this Master's degree programme provides a wide range of specialisations through elective courses in its main fields.

Your profile

You

- Want to understand, model and master natural and built-up spaces while respecting sustainable development as well as design and create structures for a natural environment;
- Are looking for a degree programme that will prepare you to meet future technological challenges facing civil and environmental engineering in an ever changing European and global context;
- Want to develop your innovative spirit and self-initiative as well as develop the necessary tools to complete your projects.

Your programme

This Master's degree offers:

- advanced training in geotechnology, hydraulics, structures and materials;
- knowledge about project procedures;
- experience in a company via a 2 month long internship;
- immersion in high-tech research laboratories;
- a large choice of elective courses;
- the possibility of completing part of your coursework or internship abroad (in Europe or elsewhere).

GCE2M - Teaching profile

Learning outcomes

Civil engineers are expected to design and construct basic infrastructure for our everyday lives while at the same time respecting and improving the environment.

This Master's degree programme aims to train experts in the field of civil and environmental engineering who will be able to take into account sustainable development, as well as the unique prototype scale of the projects and the complex natural world in which these projects take place.

The future civil engineer will acquire the necessary skills and knowledge to become:

- a professional engineer capable of integrating multiple fields of civil and environmental engineering
- a practical engineer who can use his/her knowledge for solving real-world problems and use appropriate civil engineering tools and techniques, either on construction sites or in design offices
- a specialist in cutting edge methods used in civil and environmental engineering: construction, hydraulics, geotechnology, structures, materials and environment
- a manager capable of supervising projects alone or contributing as part of a team

The multidisciplinary training offered by the Louvain School of Engineering (EPL) emphasises a combination of theory and practice as well as analysis, design, manufacturing, production, research and development and innovation while never losing sight of issues related to ethics and sustainable development.

On successful completion of this programme, each student is able to :

1.Demonstrate mastery of a solid body of knowledge and skills in basic and engineering science that allows them to solve relevant problems

1.1 Identify and use biomedical engineering concepts, laws and reasoning to solve problems related to civil and environmental engineering:

- Structures: design and calculation (cement, metal, wood, composite materials)
- Geotechnology: soil mechanics, foundations, subterranean drainage
- Hydraulic loads and open channel flow
- Infrastructure projects (bridges, dams, roads, tunnels)

1.2 Identify and use the modelling and calculation tools necessary to solve problems in the fields mentioned above

1.3 Validate problem solving results

2.Organise and carry out an engineering procedure in order to meet a specific need or solve a particular problem

2.1 Analyse all aspects of a problem, sort through available information, identify limits (rules, technical, security, budgetary, human, environmental, etc.) linked to the completion of a civil engineering project in order to write a specifications note

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5.3 Communicate through graphics and diagrams: interpret a diagram, present results, structure information.
5.4 Read and analyse different technical documents (rules, blueprints, specification notes).
5.5 Draft documents that take into account contextual requirements and social conventions.
5.6 Make a convincing oral presentation (in French or English) using modern communication techniques.

6.Behave with professionalism and rigor as well as with a sense of ethics when doing your job

6.1 Rigorously apply the standards of your field (terms, units of measure, quality standards and security).

6.2 Find solutions that go beyond strictly technical issues by considering sustainable development and the ethical aspects of a project.

6.3 Demonstrate critical awareness of a technical solution in order to verify its robustness and minimize the risks that may occur during implementation.

6.4 Evaluate oneself and independently develop necessary skills to stay up-to-date in one’s field.

Programme structure

The Master’s degree programme includes:

- 81 credits of compulsory courses, including the courses of the common core and the specialized focus, the end-of-studies work and the long internship
- 39 credits of optional courses, including a minimum of 23 credits to be chosen from the options in structures, geomechanics and hydraulics.

The company internship lasts 9 weeks and is to be completed during the second semester of the first year of the Master’s degree programme during May and June. Consequently, all coursework during this semester is completed by the end of March with the evaluation period taking place in April. Thus, students are free of all academic obligations in May and June during their internship.

The graduation project is normally completed during the 2nd year. Regarding required and elective courses, students may take these courses in the 1st or 2nd year as long as they have completed the course prerequisites. This is particularly the case for students who have completed part of their education abroad.

PROFESSIONAL FOCUS [30.0]

- 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

[FR] T

OPTIONS

The student completes his/her program with options and/or elective courses, including a minimum of 23 ECTS from the courses offered in the "Majors for Master in Civil Engineering" section".

Majors for master in civil engineering

> Major in geotechnical engineering *[en-prog-2024-gce2m-lgce223o]*
> Major in structural engineering *[en-prog-2024-gce2m-lgce226o]*
> Major in hydraulic engineering *[en-prog-2024-gce2m-lgce225o]*
> Major in architecture *[en-prog-2024-gce2m-lgce227o]*
> Major in sustainable construction *[en-prog-2024-gce2m-lgce224o]*
> Major in environnemental engineering *[en-prog-2024-gce2m-lgce232o]*

Options et cours au choix en connaissances socio-économiques

> Business risks and opportunities *[en-prog-2024-gce2m-lgce230o]*
> Major in Interdisciplinary Program in Entrepreneurship - INEO *[en-prog-2024-gce2m-lgce231o]*
> Cours au choix en connaissances socio-économiques *[en-prog-2024-gce2m-lgce200o]*

Other elective courses

> Other elective courses *[en-prog-2024-gce2m-lgce229o]*

MAJORS FOR MASTER IN CIVIL ENGINEERING

MAJOR IN GEOTECHNICAL ENGINEERING

- 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...)

L'étudiant·e qui choisit de valider cette option doit sélectionner au minimum 15 crédits parmi les cours proposés.

Year
1 2

Content:

MAJOR IN STRUCTURAL ENGINEERING

- O 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...)

L'étudiant·e qui choisit de valider cette option doit sélectionner au minimum 15 crédits parmi les cours proposés.

O Content:

				Year 1	Year 2
⊠ LGCIV2032	Prestressed concrete structures	Jean-François Cap	FR [q1] [20h+15h] [4 Credits]	x	x
⊠ LGCIV2042	Dynamics of structures	João Saraiva Esteves Pacheco De Alm	EN [q1] [30h+15h] [5 Credits] *> French-friendly*	x	x
⊠ LGCIV2043	Timber Structures	Pierre Latteur	FR [q2] [20h+15h] [4 Credits]	x	x
⊠ LGCIV2045	Structures under fire conditions	Olivier Vassart	EN [q2] [20h] [3 Credits] *> French-friendly*	x	x
⊠ LGCIV2046	Earthquake engineering	João Saraiva Esteves Pacheco De Alm			

MAJOR IN HYDRAULIC ENGINEERING

- O 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...)

L'étudiant·e qui choisit de valider cette option doit sélectionner au minimum 15 crédits parmi les cours proposés.

O Content:

				Year 1	Year 2
⊠ LGCIV2055	Analysis and mitigation of floods	Sandra Soares Frazao	EN [q1] [20h+15h] [4 Credits] > *French-friendly*	x	x
⊠ LGCIV2053	Fluvial hydraulics	Robin Meurice (compensates Sandra Soares Frazao)	EN [q2] [30h+15h] [5 Credits] > *French-friendly*	x	x
⊠ [redacted]	[redacted]	Eric Deleersnijder	EN [q1] [30h+15h] [5 Credits] > *French-friendly*	x	x
⊠ LGCIV2052	Hydropower plants	Sandra Soares Frazao	EN [q2] [20h] [3 Credits] > *French-friendly*	x	x
⊠ LBRES2204	Integrated water management of water resources	Marnik Vanclooster (coord.)			

MAJOR IN SUSTAINABLE CONSTRUCTION

- O 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

MAJOR IN ENVIRONNEMENTAL ENGINEERING

O Mandatory
⊠ Optional
△

OPTIONS ET COURS AU CHOIX EN CONNAISSANCES SOCIO-ÉCONOMIQUES

BUSINESS RISKS AND OPPORTUNITIES

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

Content:

				Year 1	Year 2
LEPL2211	Business issues introduction	Benoît Gailly	EN [q2] [30h] [3 Credits] > *French-friendly*	x	x
LEPL2212	Financial performance indicators	Anne-Catherine Provost	EN [q2] [30h+5h] [4 Credits] > *French-friendly*	x	x
LEPL2214	Law, Regulation and Legal Context	Vincent Cassiers Werner Derycke	FR [q1] [30h+5h] [4 Credits]	x	x

One course between

From 3 to 5credit(s)

LEPL2210	Ethics and ICT	Axel Gosseries Olivier Pereira	EN [q2] [30h] [3 Credits] > *French-friendly*	x	x
LLSMS2280	Business Ethics and Compliance Management	Carlos Desmet	EN [q1] [30h] [5 Credits]	x	x

Cours en marketing

MGEST1108	Marketing	Nadia Sinigaglia	FR [q2] [45h+20h] [6 Credits]	x	x
MLSMM2136	Trends in Digital Marketing	Ingrid Poncin	FR [q2] [30h] [5 Credits]		x
MLSMM2134	e-Consumer Behavior	Karine Charry	FR [q2] [30h] [5 Credits]		x

Cours en Sourcing and Procurement

LLSMS2036	Supply Chain Procurement	Per Joakim Agrell Antony Paulraj	EN [q1] [30h] [5 Credits]	x	x
LLSMS2038	Procurement Organisation and Scope	Constantin Blome Canan Kocabasoglu Hillmer (compensates Constantin Blome)	EN [q1] [30h] [5 Credits]	x	x
LLSMS2037	Sourcing Strategy	Constantin Blome Michael Henke	EN [q1] [30h] [5 Credits]	x	x

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COURS AU CHOIX EN CONNAISSANCES SOCIO-ÉCONOMIQUES

- Mandatory
- Optional
- Not offered in 2024-2025
- Not offered in 2024-2025 but offered the following year
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- Activity with requisites
- Open to incoming exchange students
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Click on the course title to see detailed informations (objectives, methods, evaluation...)

				Year 1	Year 2
LEPL2021	Innovation classes for transition and sustainable development	Benoît Macq Xavier Marichal (compensates Benoît Raucent)	EN [q1] [30h+15h] [5 Credits]	x	x

Content:

OTHER ELECTIVE COURSES

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- Mandatory
- Optional
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- 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

Content:

Les étudiants peuvent également inscrire à leur programme tout cours faisant partie des programmes d'autres masters de l'EPL moyennant l'approbation du jury restreint.

Languages

Students may select from any language course offered at the ILV. Special attention is placed on the following seminars in professional development:

				Year 1	2
⊠ LNEER2600	Seminar of entry to professional life in Dutch - Upper-Intermediate level	Isabelle Demeulenaere (coord.) Dag Houdmont	[q1 or q2] [30h] [3 Credits]	x	x

⊠ Group dynamics

⊠ LEPL2351	Become a tutor	Jean-Charles Delvenne (coord.) Delphine Ducarme Thomas Pardoen Benoît Raucent	

Course prerequisites

The **table** below lists the activities (course units, or CUs) for which there are one or more prerequisites within the programme, i.e. the programme CU for which the learning outcomes must be certified and the corresponding credits awarded by the jury before registering for that CU.

These activities are also identified **in the detailed programme**: their title is followed by a yellow square.

Prerequisites and student's annual programme

As the prerequisite is for CU registration puposes only, there are no prerequisites within a programme year. Prerequisites are defined between CUs of different years and therefore influence the order in which the student will be able to register for the programme's CUs.

In addition, when the jury validates a student's individual programme at the beginning of the year, it ensures its coherence, meaning that it may:

- require the student to combine registration in two separate CUs which it considers necessary from a pedagogical point of view.
- transform a prerequisite into a corequisite if the student is in the final year of a degree course.

For more information, please consult the Academic Regulations and Procedures.

 # Prerequisities list

LGCIV2012 "Project 2: civil engineering structures" has prerequisite(s) LGCIV2011

- LGCIV2011 - Project 1

The programme's courses and learning outcomes

For each UCLouvain training programme, a reference framework of learning outcomes specifies the 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.

GCE2M - 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

Specific access requirements

This programme is taught in English with no prerequisite in French. A certificate is required for the holders of a non-Belgian degree, see selection criteria of the Acces on the file.

University Bachelors

Diploma	Special Requirements	Access	Remarks
UCLouvain Bachelors			
Bachelor in Engineering		Direct access	Students who have neither major nor minor in the field of their civil engineering Master's degree may have an adapted master programme.
Others Bachelors of the French speaking Community of Belgium			
Bachelor in engineering		Direct access	Students with a Bachelor’s degree in engineering sciences who have not taken the equivalent of a minor in the field of their civil enginering master degree may have an adapted master programme.
Bachelors of the Dutch speaking Community of Belgium			
Bachelor in engineering		Access with additional training	Students who have no specialisation in the field of their civil enginering master degree may have an adapted master programme with up to 60 additional credits.
Foreign Bachelors			
Bachelor in engineering	Bachelor degree of Cluster Institution	Direct access	Students with a Bachelor’s degree in engineering sciences who have not taken the equivalent of a minor in the field of their civil enginering master

			degree may have an adapted master programme.
	For others institutions	Access based on application	See Personalized Access

Non university Bachelors

> Find out more about links to the university

Holders of a 2nd cycle University degree

Diploma	