

GCE2M

2014 - 2015

Master [120] in Civil Engineering

At Louvain-la-Neuve - 120 credits - 2 years - Day schedule - In frenchDissertation/Graduation Project : **YES** - Internship : **YES**Activities in English: **optional** - Activities in other languages : **optional**Activities on other sites : **NO**Organized by: **Ecole Polytechnique de Louvain (EPL)**Programme code: **gce2m** - European Qualifications Framework (EQF): 7**Table of contents**

Introduction	2
Teaching profile	3
- Learning outcomes	3
- Programme structure	4
- Detailed programme	5
- Programme by subject	5
Information	15
- Admission	15
- Teaching method	18
- Evaluation	18
- Mobility and/or Internationalisation outlook	18
- Possible trainings at the end of the programme	19
- Contacts	19

GCE2M - Introduction

Introduction

GCE2M - Teaching profile

Learning outcomes

The Master's degree in civil engineering aims to train engineers who will be able to meet future technological challenges in the scientific and technical fields relating to civil and environmental engineering, within an ever-changing European and global context.

Upon graduating, students will be familiar with the mathematical and physical methods relating to the five basic fields of civil and environmental engineering (building ; hydraulics ; geotechnics ; structures and materials ; environment) and will have acquired advanced training in some of these disciplines via project work and elective courses.

Every year, a cutting-edge project will be proposed in one of the following : hydraulics, geotechnics and structures. Concurrently, a project integrating the other two disciplines will ensure interdisciplinarity.

Students have a choice between seven options.

The first five offer a choice of courses in each of the five abovementioned fields, viz. Construction and Architecture, Hydraulics, Geotechnics, Structures and Environment, so that students can target their training.

A sixth option is made up of a series of courses emphasizing Advanced topics in civil engineering.

The objective of the seventh option in Management is to familiarize the engineering student with the basics of company management.

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

de démontrer la maîtrise d'un corpus de connaissances en sciences fondamentales, disciplinaires et polytechniques, lui permettant de résoudre des problèmes posés

1. Identifier et mettre en œuvre les concepts, lois, raisonnements applicables à une problématique donnée dans les disciplines du génie civil :
 - Structures : conception et calcul (béton, métal, bois, matériaux composites, ...) ;
 - Géotechnique : mécanique des sols, fondations, écoulements souterrains, ... ;
 - Hydraulique en charge et à surface libre ;
 - Ouvrages d'art (ponts, barrages, tunnels, ...)
2. Identifier et utiliser les outils de modélisation et de calcul adéquats pour résoudre cette problématique
3. Vérifier la vraisemblance et confirmer la validité des résultats obtenus au regard de la nature du problème posé

d'organiser, mener à son terme et valider une démarche d'ingénierie visant à répondre à un besoin ou à une problématique spécifique

1. Analyser le problème à résoudre dans toutes ses dimensions, faire le tri des informations disponibles, identifier les contraintes (réglementaires, techniques, sécuritaires, budgétaires, humaines, environnementales, contraintes d'exécution de l'ouvrage...) liées à la réalisation d'un projet de génie civil afin de rédiger le cahier des charges
2. Modéliser le problème et concevoir une ou plusieurs solution(s) technique(s) originales répondant à ce cahier des charges
3. Évaluer et classer les solutions au regard des critères figurant dans le cahier des charges (efficacité, faisabilité, qualité, fiabilité, ergonomie et sécurité dans l'environnement considéré) et des contraintes de réalisation (main d'oeuvre, matériaux, sécurité sur le chantier, accessibilité au chantier, budget...)
4. Implémenter et tester une solution sous la forme de plans, d'une maquette, d'un modèle réduit à tester en laboratoire ou d'un modèle numérique.

d'organiser et mener à son terme un travail de recherche pour appréhender un phénomène physique ou une problématique inédite relevant d'un domaine du génie civil

1. Se documenter et résumer l'état des connaissances actuelles dans le domaine considéré
2. Proposer une modélisation et/ou un dispositif expérimental permettant de simuler et de tester des hypothèses relatives au phénomène étudié
3. Mettre en forme un rapport de synthèse rédigé de telle manière que les résultats et productions présentés soient exploitables ultérieurement et par d'autres personnes, expliciter s'il y a lieu les potentialités d'innovation théoriques et/ou technique résultant de ce travail de recherche

de participer efficacement à une démarche de projet, en s'intégrant à une équipe ou en conduisant celle-ci à la réalisation finale

1. Cadrer et expliciter les objectifs d'un projet compte tenu des enjeux et des contraintes (urgence, qualité, ressources, budget ...) qui caractérisent l'environnement du projet
2. S'engager collectivement sur un plan de travail, un échéancier et des rôles à tenir
3. Fonctionner dans un environnement pluridisciplinaire, conjointement avec d'autres acteurs porteurs de différents points de vue : gérer des points de désaccord ou des conflits

- Prendre des décisions en équipe lorsqu'il y a des choix à faire, et assumer les conséquences de ces décisions, que ce soit sur les solutions techniques ou sur l'organisation du travail pour faire aboutir le projet.

de communiquer les résultats de son travail sous forme de rapports, plans, présentations ou autres documents adaptés à son interlocuteur

- Identifier clairement les besoins des « clients » ou des usagers, qui sont souvent des collectivités privées ou publiques pour des projets de génie civil : questionner, écouter et comprendre toutes les dimensions de la demande et pas seulement sur les aspects techniques
- Argumenter et convaincre en s'adaptant au langage et au niveau de connaissances de ses interlocuteurs : techniciens, collègues, clients, supérieurs hiérarchiques
- Communiquer sous forme graphique et schématique ; interpréter un schéma, présenter les résultats d'un travail, structurer des informations
- Lire, analyser et exploiter des documents techniques (normes, plans, cahier de charge...)
- Rédiger des documents écrits en tenant compte des exigences contextuelles et des conventions sociales en la matière
- Faire un exposé oral efficace, en utilisant les techniques modernes de communication

d'agir avec professionnalisme et rigueur, tout en intégrant les questions et choix éthiques dans l'exercice de ses responsabilités.

- Appliquer les normes en vigueur dans sa discipline (terminologie, unités de mesure, normes de qualité et de sécurité...)
- Trouver des solutions qui vont au-delà des enjeux strictement techniques, en intégrant les enjeux de développement durable et la dimension éthique d'un projet
- Faire preuve d'esprit critique vis-à-vis d'une solution technique pour en vérifier la robustesse et minimiser les risques qu'elle présente au regard du contexte de sa mise en œuvre
- S'auto-évaluer et développer de manière autonome les connaissances nécessaires pour rester compétent dans son domaine

Programme structure

The Master's curriculum in civil engineering will consist of at least 120 credits covering two years, with a minimum of 60 credits per year, and comprising :

- a core curriculum (64 credits)
- a specialization curriculum (30 credits)
- one option (at least 15 credits) from amongst the seven proposed options (Advanced topics in civil engineering, Hydraulics, Geotechnics, Structures, Environment, Building and architecture, Management).
- elective courses if necessary.

The final thesis is generally written during the last year. However, depending on their specific training objectives, students may choose to take any given course in the first or second year, subject to possible prerequisites. This will be the case in particular for students pursuing part of their education abroad.

If, in the course of his (her) former curriculum, a student has already been credited with a subject included in the compulsory core curriculum, or any training deemed equivalent, this subject will be replaced by elective courses, while conforming to imposed constraints. The student is responsible for checking whether the minimum total number of credits has been reached, as well as those of the specialized field, which will appear on the final diploma.

The student's curriculum will be submitted for acceptance by the relevant diploma committee.

Whatever the focus or the options chosen, the programme of this master shall totalize 120 credits, spread over two years of studies each of 60 credits.

> [Tronc commun du master ingénieur civil des constructions](#) [en-prog-2014-gce2m-lgce220t.html]

> [Professional focus](#) [en-prog-2014-gce2m-lgce220s]

Options courses

> [Options du master ingénieur civil des constructions](#) [en-prog-2014-gce2m-lgce909r.html]

> [Option en géotechnique](#) [en-prog-2014-gce2m-lgce223o.html]

> [Option en structure](#) [en-prog-2014-gce2m-lgce226o.html]

> [Option en hydraulique](#) [en-prog-2014-gce2m-lgce225o.html]

> [Option en construction et architecture](#) [en-prog-2014-gce2m-lgce227o.html]

> [Business risks and opportunities](#) [en-prog-2014-gce2m-lgce228o.html]

> [Option facultaire en création de petites et moyennes entreprises](#) [en-prog-2014-gce2m-lfa221o.html]

> [Cours au choix du master ingénieur civil des constructions](#) [en-prog-2014-gce2m-lgce221o.html]

GCE2M Detailed programme

Programme by subject

CORE COURSES [60.0]

○ Mandatory

△ Courses not taught during 2014-2015

⊕ Periodic courses taught during 2014-2015

⊗ Optional

⊖ Periodic courses not taught during 2014-2015

⊞ Two years course

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

						Year	
						1	2
○ LGCE2990	Graduation project/End of studies project	N.		28 Credits			x

○ Génie civil et environnemental (18 credits)

○ LAUCE2031	Reinforced concrete structures	Jean-François Cap	37.5h +22.5h	5 Credits	1q	x	
○ LAUCE2124	Construction stability	Pierre Latteur	20h+15h	3 Credits	2q	x	
○ LAUCE2151	Hydraulique appliquée	Sandra Soares Frazao	30h+30h	5 Credits	1q	x	
○ LAUCE2171	Geotechnics	Alain Holeyman, Ramiro Daniel Verástegui Flores	45h+15h	5 Credits	1q	x	

○ Projet en génie civil (12 credits)

○ LAUCE2111	Project 1: Building	Alain Holeyman, Pierre Latteur, Thomas Vandenberg, Denis Zastavni	30h+40h	6 Credits	1q	x	
○ LAUCE2112	Project 2 : structures	Didier Bousmar, Bernard Cols, Alain Holeyman, Pierre Latteur	30h+40h	6 Credits	1q	x	

○ Religion courses for student in exact sciences

The student shall select 2 credits from amongst

⊗ LTECO2100	Questions of religious sciences: Biblical readings	Hans Ausloos	15h	2 Credits	1q	x	x
⊗ LTECO2200	Questions of religious sciences: reflections about Christian faith	Dominique Martens	15h	2 Credits	2q	x	x
⊗ LTECO2300	Questions of religious sciences: questions about ethics	Philippe Cochinaux	15h	2 Credits	1q	x	x

PROFESSIONAL FOCUS [30.0]

○ Mandatory

△ Courses not taught during 2014-2015

⊕ Periodic courses taught during 2014-2015

⊗ Optional

⊖ Periodic courses not taught during 2014-2015

⊞ Two years course

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

Year

1 2

○ Cours obligatoires (20 credits)

Les étudiants qui ont déjà suivi en bac (mineure en gestion) le cours LFSA 1290 le remplaceront par un cours équivalent.

○ LAUCE2032	Prestressed concrete structures	Jean-François Cap	20h+15h	3 Credits	2q	x	
○ LAUCE2152	Hydraulics structures, bridges, roads	Didier Bousmar, Colette Grégoire, Laurent Ney	45h+15h	5 Credits	2q	x	
○ LAUCE2162	Geotechnic Design	Alain Holeyman	20h+15h	3 Credits	2q	x	
○ LAUCE2182	Metal and mixed structures	Catherine Doneux, Olivier Vassart	30h+30h	5 Credits	1q	x	
○ LFSA1290	Introduction to financial and accounting management	Thomas Lambert (compensates Gerrit Sarens), Gerrit Sarens	30h+15h	4 Credits	2q	x	x

○ Company training periods (10 credits)

Students may include in their curriculum a company training period worth 10 credits. However, if this activity is related to their final thesis, they shall choose the 5-credit LFSA 2996 course.

⊗ LFSA2995	Company Internship	Claude Oestges	30h	10 Credits		x	x
⊗ LFSA2996	Company Internship	N.		5 Credits		x	x

OPTIONS

Options du master ingénieur civil des constructions

- > [Option en géotechnique](#) [en-prog-2014-gce2m-lgce223o]
- > [Option en structure](#) [en-prog-2014-gce2m-lgce226o]
- > [Option en hydraulique](#) [en-prog-2014-gce2m-lgce225o]
- > [Option en construction et architecture](#) [en-prog-2014-gce2m-lgce227o]
- > [Business risks and opportunities](#) [en-prog-2014-gce2m-lgce228o]
- > [Option facultaire en création de petites et moyennes entreprises](#) [en-prog-2014-gce2m-lfsa221o]
- > [Cours au choix du master ingénieur civil des constructions](#) [en-prog-2014-gce2m-lgce221o]

OPTIONS DU MASTER INGÉNIEUR CIVIL DES CONSTRUCTIONS

OPTION EN GÉOTECHNIQUE

Cette option a pour objectif de fournir aux étudiants une formation avancée dans le domaine de la géotechnique. Dans ce but, les connaissances des étudiants relatives aux propriétés physiques et au comportement des géomatériaux sont d'abord complétées, faisant notamment appel à la notion d'état critique. Sont entre autres abordés la mécanique des roches, les lois de comportement statique et dynamique des sols, la modélisation numérique de ces lois et certains aspects plus particuliers comme l'hydrogéologie et le géoenvironnement. La gestion des risques géotechniques est couverte dans le cadre des séismes, des accidents environnementaux, ainsi que dans le cadre de la géotechnique des fonds marins (Offshore Geotechnics).

● Mandatory

△ Courses not taught during 2014-2015

⊕ Periodic courses taught during 2014-2015

⊗ Optional

⊖ Periodic courses not taught during 2014-2015

‡ Two years course

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

De 15 à 30 credits parmi

					Year	
					1	2
⊗ LAUCE2145	Projet d'initiative	Sandra Soares Frazao		3 Credits		x x
⊗ LAUCE2165	Soil Testing and Modelling	Ramiro Daniel Verástegui Flores	20h+15h	4 Credits	1q	x x
⊗ LAUCE2167	Offshore Geotechnics	Ramiro Daniel Verástegui Flores	20h	3 Credits	2q ⊗	x x
⊗ LAUCE2176	Geotechnical risks	Alain Holeyman, Jean-François Vanden Berghe	40h+10h	5 Credits	1q	x x
⊗ LAUCE2178	Geosynthetics	Marc Demanet	20h	3 Credits	2q ⊕	x x
⊗ LAUCE2191	Hydrogeology and Geoenvironment	Pierre-Yves Bolly, Alain Holeyman	40h+10h	5 Credits	2q	x x
⊗ LBIR1336	Sciences du sol	Pierre Delmelle (compensates Bruno Delvaux), Pierre Delmelle (coord.), Bruno Delvaux	30h+30h	5 Credits	2q	x x
⊗ LBIRE2101	Statistical analysis of spatial and temporal data	Patrick Bogaert	22.5h +15h	3 Credits	2q	x x

OPTION EN STRUCTURE

Cette option a pour objectif de fournir aux étudiants des notions complémentaires à la matière structure notamment en ouvrant au comportement de matériaux structuraux autres que ceux habituellement utilisés. Certains aspects numériques plus approfondis sont aussi traités.

● Mandatory

△ Courses not taught during 2014-2015

⊕ Periodic courses taught during 2014-2015

⊗ Optional

⊙ Periodic courses not taught during 2014-2015

‡ Two years course

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

De 15 à 30 credits parmi

Year

1 2

						1	2
⊗ LAUCE2125	Numerical analysis of civil engineering structures	Jean-François Remacle	30h+15h	5 Credits	1q △	x	x
⊗ LAUCE2128	Structures under seismic & fire conditions	Catherine Doneux, Olivier Vassart	20h	3 Credits	2q	x	x
⊗ LAUCE2145	Projet d'initiative	Sandra Soares Frazao		3 Credits		x	x
⊗ LAUCE2183	wood structures	Pierre Latteur	30h	3 Credits	2q	x	x
⊗ LAUCE2185	Dynamics of structures	Jean-Pierre Coyette	30h+30h	5 Credits	1q	x	x
⊗ LAUCE2386	Conception de l'architecture avec le bois	Frank Norrenberg	22.5h	2 Credits	1q ⊙	x	x
⊗ LMECA2520	Calculation of planar structures	Issam Doghri	30h+30h	5 Credits	1q	x	x
⊗ LMECA2131	Introduction to nonlinear solid mechanics.	Issam Doghri	30h+30h	5 Credits	2q	x	x
⊗ LMECA2640	Mechanics of composite materials.	Issam Doghri, Frédéric Lani	30h+30h	5 Credits	2q	x	x
⊗ LMAPR2482	Plasticity and metal forming	Laurent Delannay, Thomas Pardoën (coord.)	30h +22.5h	5 Credits	2q	x	x

OPTION EN HYDRAULIQUE

Cette option a pour objectif de fournir aux étudiants les notions complémentaires de la matière hydraulique. Sont abordés des aspects plus numériques ou en relation avec la maîtrise des rivières et des nappes aquifères (hydrogéologie).

● Mandatory

△ Courses not taught during 2014-2015

⊕ Periodic courses taught during 2014-2015

⊗ Optional

⊖ Periodic courses not taught during 2014-2015

‡ Two years course

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

De 15 à 21 credits parmi

						Year	
						1	2
⊗ LAUCE2145	Projet d'initiative	Sandra Soares Frazao		3 Credits		x	x
⊗ LAUCE2153	Fluvial hydraulics	Sandra Soares Frazao	20h+15h	4 Credits	2q	x	x
⊗ LAUCE2154	Transitional flows	Sandra Soares Frazao, Benoît Spinewine	20h+15h	4 Credits	1q	x	x
⊗ LAUCE2155	Floods and low-water level	Sandra Soares Frazao, Yves Zech	20h	3 Credits	2q	x	x
⊗ LAUCE2157	Coastal and sea hydraulics	Eric Deleersnijder, Benoît Spinewine	30h+15h	5 Credits	1q	x	x
⊗ LAUCE2158	Hydroelectric Developments	Yves Zech	20h	3 Credits	1q	x	x
⊗ LBRES2204	Integrated water management of water resources	Olivier Cogels, Marnik Vanclooster (coord.)	30h +22.5h	5 Credits	1q	x	x
⊗ LMECA2853	Turbulence.	Eric Deleersnijder, Grégoire Winckelmans	30h+30h	5 Credits	1q	x	x

OPTION EN CONSTRUCTION ET ARCHITECTURE

Cette option a pour objectif de fournir aux étudiants une ouverture plus architecturale de la matière construction - bâtiments. L'accent est mis sur des aspects de durabilité, de conception architecturale et de droit du bâti.

● Mandatory

△ Courses not taught during 2014-2015

⊕ Periodic courses taught during 2014-2015

⊗ Optional

⊙ Periodic courses not taught during 2014-2015

‡ Two years course

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

De 15 à 30 credits parmi

						Year	
						1	2
⊗ LAUCE2145	Projet d'initiative	Sandra Soares Frazao		3 Credits		x	x
⊗ LAUCE2344	Programming for large-scale projects	Nicolas Van Oost	40h	4 Credits	2q ⊕	x	x
⊗ LAUCE2370	Analyse et composition urbaine	Christian Gilot	30h	3 Credits	1q	x	x
⊗ LAUCE2371	Analyse et composition des édifices	Olivier Masson (compensates Jean Stillemans), Olivier Masson , Jean Stillemans (coord.)	30h	3 Credits	2q	x	x
⊗ LAUCE2380	Economie et politique de l'édification	Olivier Masson , David Vanderburgh , Denis Zastavni	22.5h	2 Credits	2q	x	x
⊗ LAUCE2591	Droit de l'espace bâti et non bâti	Charles-Hubert Born , Christophe Thiebaut	30h	3 Credits	1q	x	x
⊗ LICAR1304	Architecture and the City 1 [15h] (2 credits) Semester 1	Christian Gilot	30h	3 Credits	2q	x	x
⊗ LAUCE2372	Analyse et composition paysagère	Pierre Cloquette (compensates Jean Stillemans), Bernard Declève , Jean Stillemans	30h	3 Credits	2q	x	x
⊗ LAUCE2350	Architecture civile	Denis Zastavni	40h	4 Credits	1q	x	x
⊗ LAUCE2363	Building physics II: utilities - Part A: design - Part B: dimensioning	Magali Bodart , Geoffrey Van Moeseke	40h	4 Credits	2q	x	x

BUSINESS RISKS AND OPPORTUNITIES

Commune à la plupart des masters ingénieur civil, cette option a pour objectif de familiariser l'étudiant avec les principes de base de la gestion des entreprises.

● Mandatory

△ Courses not taught during 2014-2015

⊕ Periodic courses taught during 2014-2015

⊗ Optional

⊖ Periodic courses not taught during 2014-2015

‡ Two years course

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

De 16 à 20 credits parmi

						Year	
						1	2
⊗ LFSA2140	Elements of law for industry and research	Fernand De Visscher, Werner Derijcke, Bénédicte Inghels	30h	3 Credits	1q	x	x
⊗ LFSA2230	Introduction to management and to business economics	Benoît Gailly	30h+15h	4 Credits	2q	x	x
⊗ LFSA1290	Introduction to financial and accounting management	Thomas Lambert (compensates Gerrit Sarens), Gerrit Sarens	30h+15h	4 Credits	2q	x	x
⊗ LFSA2202	Ethics and ICT	Maxime Lambrecht, Olivier Pereira	30h	3 Credits	2q	x	x
⊗ LFSA2245	Environment and Business	Thierry Bréchet	30h	3 Credits	1q	x	x
⊗ LFSA2210	Organisation and human resources	John Cultiaux	30h	3 Credits	1q	x	x

⊗ Alternative to the "Business risks and opportunities" for computer science students

Computer science students who have already followed various courses of this discipline during their Bachelor's curriculum can select between 16 and 20 credits in the program "mineure en gestion pour les sciences informatiques" <http://www.uclouvain.be/xprog-2013-min-lgesc100i>

OPTION FACULTAIRE EN CRÉATION DE PETITES ET MOYENNES ENTREPRISES

○ Mandatory

△ Courses not taught during 2014-2015

⊕ Periodic courses taught during 2014-2015

⊗ Optional

⊖ Periodic courses not taught during 2014-2015

‡ Two years course

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

De 20 à 25 credits parmi

Year

1 2

○ Compulsory courses

Course Code	Course Title	Instructor	Hours	Credits	Year 1	Year 2
○ LCPME2001	Entrepreneurship Theory (in French)	Frank Janssen	30h+20h	5 Credits	1q	x
○ LCPME2003	Business plan of the creation of a company (in French)	Frank Janssen	30h+15h	5 Credits	2q	x
○ LCPME2002	Managerial, legal and economic aspects of the creation of a company (in French)	Régis Coeurderoy, Yves De Cordt	30h+15h	5 Credits	1q	x x
○ LCPME2004	Advanced seminar on Entrepreneurship (in French)	Frank Janssen	30h+15h	5 Credits	2q	x x

⊗ Prerequisite CPME course

Students who have not taken a management course within their former curriculum shall include LCPME2000 in their current curriculum.

Course Code	Course Title	Instructor	Hours	Credits	Year 1	Year 2
○ LCPME2000	Venture creation financing and management I	Régis Coeurderoy, Olivier Giacomini, Paul Vanzeveren	30h+15h	5 Credits	1 + 2q	x

COURS AU CHOIX DU MASTER INGÉNIEUR CIVIL DES CONSTRUCTIONS

L'étudiant choisit librement des cours endéans les modalités détaillées ci-dessous de manière à totaliser, quelles que soient la finalité ou les options choisies, un minimum de 120 crédits répartis sur deux années d'études correspondant à 60 crédits chacune.

Les étudiants n'ayant pas suivi les cours suivants au cours de leur bachelier en Sciences de l'ingénieur sont encouragés à les considérer pour leur choix : FSAB1103, MECA2120 et FSAB1106.

○ Mandatory

△ Courses not taught during 2014-2015

⊕ Periodic courses taught during 2014-2015

⊗ Optional

⊖ Periodic courses not taught during 2014-2015

‡ Two years course

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

Year

1 2

Course Code	Course Title	Instructor	Hours	Credits	Year 1	Year 2
⊗ LAUCE2801	Génie civil : routes (ECAM, code cours local RO30C)	N.	30h	3 Credits	2q	x x
⊗ LAUCE2802	Genie civil : ponts (ECAM, code cours local PO40T)	N.	30h	3 Credits	2q	x x
⊗ LAUCE2804	Wegen, Bruggen en tunnels (KULeuven, code cours local: H04L7A)	Sandra Soares Frazao	30h+15h	6 Credits	2q	x x
⊗ LAUCE2805	Industriële bouwwerken (KULeuven, code cours local H03R8A)	Sandra Soares Frazao	0h+22.5h	3 Credits	2q	x x
⊗ LFSA2351A	Group dynamics	Piotr Sobieski (coord.)	15h+30h	3 Credits	1q	x x
⊗ LFSA2351B	Group dynamics	Piotr Sobieski (coord.)	15h+30h	3 Credits	2q	x x

⊗ Advanced courses

Students should note that any course appearing in the options of their Master -s, but not selected as such, remains a possible elective.
Students should note that any course appearing in the options of their Master -s, but not selected as such, remains a possible elective.

⌘ Short term exchanges

Students may include in their curriculum any BEST or ATHENS courses subject to approval by the Program committee. These courses are worth 2 credits
Students may include in their curriculum any BEST or ATHENS subject to approval by the Diploma committee. These courses are worth 2 credits

⌘ General knowledge courses

Students can also include in their curriculum any course given at UCL, KULeuven or Von Karman Institute subject to approval of the program committee.
Students can also include in their curriculum any course given at UCL or FIW / KULeuven subject to approval of the Diploma committee.

⌘ LMECA2645	Major technological hazards in industrial activity.	Denis Dochain, Alexis Dutrieux	30h	3 Credits	2q	X	X
⌘ LDROP2063	Environmental Law	Nicolas de Sadeleer, Damien Jans	30h	5 Credits	2q	X	X
⌘ LECGE1223	Production and Operations Management	Pierre Semal	30h	4 Credits	1q	X	X
⌘ LELEC2811	Instrumentation and sensors	David Bol, Laurent Francis	30h+30h	5 Credits	1q	X	X
⌘ LINMA2671	Automatic : Theory and implementation	Julien Hendrickx	30h+30h	5 Credits	1q	X	X
⌘ LMAPR2018	Rheometry and Polymer Processing	Christian Bailly, Evelyne Van Ruymbeke	30h +22.5h	5 Credits	2q	X	X
⌘ LMAPR2510	Mathematical ecology	Eric Deleersnijder, Emmanuel Hanert, Thierry Van Effelterre	30h +22.5h	5 Credits	2q	X	X
⌘ LMAPR2648	Sustainable treatment of industrial and domestic waste: Case studies	Spyridon Agathos, Damien Debecker, Olivier Françoisse, Patricia Luis Alconero, Olivier Noiset	30h+15h	5 Credits	1q	X	X
⌘ LPHY2150	Physique et dynamique de l'atmosphère et de l'océan I	Michel Crucifix, Thierry Fichet	45h+9h	6 Credits	1q	X	X
⌘ LPHY2153	Introduction à la physique du système climatique et à sa modélisation	Hugues Goosse (compensates Jean- Pascal van Ypersele de Strihou), Hugues Goosse, Jean-Pascal van Ypersele de Strihou	30h+15h	5 Credits	1q	X	X

⌘ Humanities

A list of interesting humanities courses is available at the secretariat of the program committee. Students may choose a maximum of 6 credits. This possibility is however not offered to students who have chosen to specialize in Management or Company launching.

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⌘ Languages

Students may include in their electives any language course of the Institute of Modern Languages (ILV) for a maximum of 3 credits within the 120 basic credits of their Masters. Their attention is drawn to the following professional insertion seminars:

Students may include in their electives any language course of the Institute of Modern Languages (ILV) for a maximum of 3 credits within the 120 basic credits of their Master's. Their attention is drawn to the following professional insertion seminars:

⌘ LNEER2500	Professional development seminar: Dutch - intermediate level	Isabelle Demeulenaere (coord.), Mariken Smit	30h	3 Credits	1 ou 2q	X	X
⌘ LNEER2600	Professional development seminar: Dutch - upper-intermediate level	Isabelle Demeulenaere, Marie- Laurence Lambrecht	30h	3 Credits	1 ou 2q	X	X
⌘ LALLE2500	Professional development seminar German	Caroline Klein, Ann Rinder (coord.)	30h	3 Credits	1 + 2q	X	X
⌘ LALLE2501	Professional development seminar-German	Caroline Klein, Ann Rinder (coord.)	30h	5 Credits	1 + 2q	X	X
⌘ LESPA2600	Professional development seminar - Spanish	Isabel Baeza Varela, Carmen Vallejo Villamor	30h	3 Credits	1 ou 2q	X	X

						Year	
						1	2
⌘ LESPA2601	Professional development seminar- Spanish	Paula Lorente Fernandez (coord.)	30h	5 Credits	1q	x	x

GCE2M - Information

Admission

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

- [University Bachelors](#)
- [Non university Bachelors](#)
- [Holders of a 2nd cycle University degree](#)
- [Holders of a non-University 2nd cycle degree](#)
- [Adults taking up their university training](#)
- [Personalized access](#)

University Bachelors

Diploma	Special Requirements	Access	Remarks
UCL Bachelors			
Bachelor in engineering [180.0]	Minor in civil engineering	Direct access	A student with no major in civil engineering, nor an option deemed equivalent, but with a minor in civil engineering, or an option deemed equivalent, shall submit a customized programme in agreement with an advisor from the Civil engineering diploma committee. To this end, 15 credits of elective courses of the Master's in civil engineering may be included.
Bachelor in engineering [180.0]		Access with additional training	A bachelor in engineering with no major nor minor in civil engineering, shall submit an application to the Civil engineering diploma committee, including a detailed past curriculum (courses and grades by year). The committee will propose a customized curriculum by drawing on the volume of elective courses of the Master's in civil engineering curriculum, and imposing, if necessary, up to 15 credits of complementary courses.
		Direct access	
Others Bachelors of the French speaking Community of Belgium			
Bachelor in engineering	With specific options in former institution related to civil engineering	Direct access	
Bachelor in engineering		Access with additional training	Bachelor in engineering Admission subject to complementary studies A bachelor in engineering with no former option in civil engineering, shall submit an application to the Civil engineering diploma committee, including a detailed past curriculum (courses and grades by year). The committee will propose a customized curriculum by drawing on the

			volume of elective courses of the Master's in civil engineering curriculum, and imposing, if necessary, up to 15 credits of complementary courses
Bachelors of the Dutch speaking Community of Belgium			
Bachelor in engineering	With specific options in former institution related to civil engineering	Direct access	
Bachelor in engineering		Access with additional training	A student with no former option in civil engineering shall submit an application to the Civil engineering diploma committee, including a detailed past curriculum (courses and grades by year). The committee will propose a customized curriculum by drawing on the volume of elective courses of the civil engineering curriculum, and imposing, if necessary, up to 15 credits of complementary courses.
Foreign Bachelors			
Bachelor in engineering	Bachelors from the Cluster network	Direct access	Conditions imposed on UCL Engineering Bachelor.
Bachelor in engineering	Other institutions.	Access with additional training	The student shall submit an application to the Faculty of applied sciences, including a detailed past curriculum (courses and grades by year). The Faculty, after consulting the relevant programme committee, will decide as to the applicant's admissibility pursuant to rules relative to links between degrees. If necessary the Faculty can propose a customized curriculum, by drawing on the volume of elective courses of the relevant engineering Master's curriculum and, if necessary, up to 15 credits of complementary courses.

Non university Bachelors

Diploma	Access	Remarks
> Find out more about links to the university		
> BA en sciences industrielles - type long	Accès au master moyennant réussite d'une année préparatoire de max. 60 crédits	Type long

Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks
"Licenciés"			

Engineers considered equivalent to the corresponding Bachelor's degree	Direct access
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Masters

Master in engineering	Direct access
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Holders of a non-University 2nd cycle degree

Diploma	Access	Remarks
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> Find out more about [links](#) to the university

> MA en sciences de l'ingénieur industriel (toutes finalités)	Accès direct au master moyennant ajout éventuel de 15 crédits max	Type long
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Adults taking up their university training

> See the website [Valorisation des acquis de l'expérience](#)

It is possible to gain admission to all masters courses via the validation of professional experience procedure.

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Personalized access

Reminder : all Masters (apart from Advanced Masters) are also accessible on file.

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Admission and Enrolment Procedures for general registration

Teaching method

. Features favouring interdisciplinarity :

The Master's degree in civil engineering is intrinsically interdisciplinary, thanks to a comprehensive project (integrated project in civil engineering), common options with the Master's in architecture (design and architecture), and partly common options with the Master's in applied physics, chemistry and materials, mechanical, and biomedical (environment) engineering, as well as town planning and territorial development streams. Moreover, a student who so wishes has the possibility to acquire knowledge in non-technical fields via elective courses.

. Variety of teaching situations :

The pedagogy implemented in the engineering Master's curriculum is aligned with that of the engineering Bachelor's curriculum: active learning, a balanced mix of group and individual work, and substantial time devoted to the development of non-technical competencies.

Via a pedagogy which emphasizes projects integrating various disciplines, the training will develop students' critical mind in designing, modelling and experimental laboratory testing.

A salient feature of the curriculum is the immersion of students in the research laboratories of the various instructors (during teaching laboratory sessions, case studies, projects and final thesis), which allows them to become familiar with up-to-date methods in the related fields, and to learn through the questioning approach which is inherent to research.

The final project amounts to half the workload of the final year. It offers the opportunity of in-depth analysis of a given topic and, through its sheer size and context, provides a true introduction to the professional life of an engineer or researcher.

. Variety of learning situations :

The student will encounter a variety of pedagogical tools tailored to the various disciplines : formal lectures, individual projects in small groups, tutorials, project-based learning, case studies, experimental laboratory work, computer simulations, teachware, industrial or research training, visits to construction sites and industries, end of studies trip, individual and group work, seminars given by outside scientists, etc. For some topics, e-learning will allow students to acquire knowledge at their own rhythm and carry out virtual experimentation.

This variety of situations will help students to build their knowledge in an iterative and progressive manner, while developing their autonomy, organizational skills, time management, and capacity to use various modes of communication, etc. Students will have access to the most up-to-date computing tools (hardware, network software) in carrying out their assignments.

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".

All learning activities are assessed as prescribed by the University internal regulations (see exam regulations), viz. written and oral exams, laboratory exams, individual or group work, public presentation of projects and final thesis.

Mobility and/or Internationalisation outlook

Global framework

The Faculty of Applied Sciences has taken part, since their inception, in all the various mobility programmes which have been set up at both the European and world levels.

The numerous contacts it has with professional circles, notably via its Advisory Board, have demonstrated to what extent employers are favourably impressed by a mobility experience in someone's CV. The ever-increasing internationalization of research via networks linking laboratories throughout the world, speaks in favour of encouraging this mobility.

Students' interest is aroused at the end of their Bachelor studies, notably via intensive courses such as those of the ATHENS () or BEST () networks.

In the course of the two-year Master's programme, students are encouraged to take part in a 1- or 2-semester exchange scheme. Within Belgium, the Faculty of Applied Sciences is involved in a privileged partnership with the Faculteit Ingenieurswetenschappen of the Katholieke Universiteit Leuven, with whom it has set up an exchange scheme relating to the first year of the Master's curriculum (<https://eng.kuleuven.be/>).

At the European level, the Faculty of Applied Sciences is strongly involved in the CLUSTER excellence network (). This network encourages internal mobility, since this is a guarantee of quality as concerns both the level of teaching and the hosting of exchange students. Moreover, Cluster partners have signed an agreement recognizing each other's Bachelor's curricula. This agreement stipulates that all Bachelors of network institutions will have access to the Master's studies in any institution on a par with local students.

Outside Europe, the Faculty of Applied Sciences is a partner in the Magalhaes network, which groups about fifteen European universities together with the best South American science and technology universities (<https://www.magalhaes-network.net/>).

Besides these network partnerships, the Faculty has also signed a number of individual agreements with various universities in Europe, North America or elsewhere in the world. A list of these agreements may be found on the website of UCL International Relations (<https://www.uclouvain.be/international.html>).

UCL is also a partner in the TIME programme () which gives students the opportunity to obtain two engineering degrees, via a specifically tailored curriculum.

- International possibilities (for UCL students)

Besides intensive courses which are one component of international relations, EPL students with outstanding results are encouraged to apply for 5- or 10-month exchange programmes.

When taking place during the first Master's year, exchanges are generally 10 months long. In the second year, they only last for a semester, either as courses or else research in a foreign laboratory as a complement to the final thesis.

Some other more specific exchange programmes have been set up with South America, where the academic year is naturally on an "austral" basis.

Students are informed about the various exchange programmes as from their second Bachelor's year. They are encouraged to prepare for their exchange in a timely manner, notably by taking language courses at the Modern Languages Institute of UCL.

Possible trainings at the end of the programme

Accessible complementary Master's degrees

Accessible Ph. D. curricula

Contacts

Curriculum Management

Entite de la structure GCE

Acronyme	GCE
Dénomination	Civil and environmental engineering
Adresse	Place du Levant, 1 bte L5.05.01 1348 Louvain-la-Neuve Tél 010 47 21 12 - Fax 010 47 21 79
Secteur	Secteur des sciences et technologies (SST)
Institut	Institute of Mechanics, Materials and Civil Engineering (IMMC)
Pôle	Civil and environmental engineering (GCE)

Academic Supervisor : [Sandra SOARES FRAZAO](#)

Jury

Président du Jury : **Jean-Didier LEGAT**

Secrétaire du Jury : **Sandra SOARES FRAZAO**

Usefull Contacts

Secrétariat : **Viviane DELMARCELLE**

