

**GCE2M**

2016 - 2017

Master [120] in Civil Engineering

**At Louvain-la-Neuve - 120 credits - 2 years - Day schedule - In french**Dissertation/Graduation Project : **YES** - Internship : **YES**Activities in English: **optional** - Activities in other languages : **optional**Activities on other sites : **NO**Main study domain : **Sciences de l'ingénieur et technologie**Organized by: **Ecole Polytechnique de Louvain (EPL)**Programme code: **gce2m** - Francophone Certification Framework: 7**Table of contents**

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## GCE2M - Introduction

### Introduction

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#### 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

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

This Master's degree programme aims to train experts in the field of civil and environmental engineering while taking into account sustainable development and the complex natural world in which their projects will take place.

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

- a professional engineer capable of integrating multiple fields of civil and environmental engineering
- someone with field experience who can put his/her knowledge into practice and put to good use civil engineering tools and techniques at the construction site or in the office
- a specialist in cutting edge methods used in civil and environmental engineering: construction, hydraulics, geotechnology, structures, materials and environment
- a manager capable of overseeing projects alone or 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

2.2 Model a problem and design one or more original technical solutions with the specifications note in mind.

2.3 Evaluate and classify solutions with regard to the criteria in the specifications note (efficiency, feasibility, quality, ergonomics, security) as well as the limits (workforce, materials, construction site security and accessibility, budget, etc.)

2.4 Test a solution as a blueprint, prototype and/or model scaled down for laboratory testing or numerical modelling.

2.5 Come up with recommendations to improve the operational nature of the solution under study.

#### **3. Organise and carry out a research project to understand a physical phenomenon or new problem pertaining to civil engineering**

3.1 Document and summarize the existing body of knowledge.

3.2 Suggest a model and/or an experimental device allowing for the simulation and testing of hypotheses related to the phenomenon being studied.

3.3 Write a summary report in such a way as the results are usable later on by other people; explain any potential theoretical and/or technical innovations resulting from the research

#### **4. Participate in a group project**

- 4.1 Frame and explain the project's objectives while taking into account its issues and constraints (deadlines, quality, resources, budget)
- 4.2 Collaborate on a work schedule, deadlines and roles to be played
- 4.3 Work in a multidisciplinary environment with peers holding different points of view; manage any resulting disagreement or conflicts.

- 4.4 Make team decisions and assume the consequences of these decisions (whether they are about technical solutions or the division of labour to complete a project).
- 4.5 Communicate effectively through reports, blueprints, presentations or other documents tailored to your interlocutor/contact person

### 5. Communicate effectively through reports, blueprints, presentations or other documents tailored to your interlocutor/contact person

- 5.1 Identify the needs of the clients or users (who often come from public or private entities): question, listen and understand all aspects of their request and not just the technical aspects.
- 5.2 Present your arguments convincingly to your interlocutors (technicians, colleagues, clients, superiors).
- 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:

- Core curriculum (35 credits)
- Final specialisation courses (30 credits), which includes a 9 week long company internship
- One or more major fields of study and elective courses (see below)

The company internship lasts 9 weeks and is completed during the second semester of the 2nd year of the Master's degree programme during May and June. As a result, 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 when they begin their internship.

The graduation project is normally completed during the 2nd year. Regarding required and elective courses, students may (depending on their major) 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 completed part of their education abroad.

If during the student's previous studies, he or she has already taken a course that is part of the programme (either required or elective) or they have participated in an academic activity that is approved by the programme commission, the student may count this activity toward their graduation requirements (but only if they respect programme rules). The student will also verify that he/she has obtained the minimum number of credits required for the approval of their diploma as well as for the approval of their major (in order to include their academic distinctions in the diploma supplement).

These types of programmes will be submitted for approval by the relevant Master's degree programme commission.

*For a programme-type, and regardless of the focus, options/or elective courses selected, this master will carry a minimum of 120 credits divided over two annual units, corresponding to 60 credits each.*

[> Core courses for the Master in Civil Engineering](#) [ en-prog-2016-gce2m-lgce220t.html ]

[> Professional focus](#) [ en-prog-2016-gce2m-lgce220s ]

Options courses

[> Majors for master in civil engineering](#) [ en-prog-2016-gce2m-lgce909r.html ]

[> Major in geotechnology](#) [ en-prog-2016-gce2m-lgce223o.html ]

[> Major in structure](#) [ en-prog-2016-gce2m-lgce226o.html ]

[> Major in hydraulics](#) [ en-prog-2016-gce2m-lgce225o.html ]

[> Major in construction and architecture](#) [ en-prog-2016-gce2m-lgce227o.html ]

[> Major in business creation and management](#) [ en-prog-2016-gce2m-lgce915r.html ]

[> Major in small and medium sized business creation](#) [ en-prog-2016-gce2m-lisa221o.html ]

[> Major in Business risks and opportunities](#) [ en-prog-2016-gce2m-lgce228o.html ]

[> Elective courses for the Master's degree in civil engineering](#) [ en-prog-2016-gce2m-lgce916r.html ]

[> Elective courses](#) [ en-prog-2016-gce2m-lgce229o.html ]

## GCE2M Detailed programme

### Programme by subject

#### CORE COURSES [60.0]

- Mandatory  
△ Courses not taught during 2016-2017  
⊕ Periodic courses taught during 2016-2017  
⊗ Optional  
⊖ Periodic courses not taught during 2016-2017  
■ Activity with requisites

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

							Year	
							1	2
●	LGCE2990	Graduation project/End of studies project	Viviane.Delmarcelle (coord.)	28 Credits			x	
<b>○ Civil and environmental engineering (18 credits)</b>								
●	LG CIV2031	Reinforced concrete structures	Jean-Francois.Cap	37.5h +22.5h	5 Credits	1q	x	
●	LG CIV2034	Construction stability	Pierre.Latteur	20h+15h	3 Credits	2q	x	
●	LG CIV2051	Applied hydraulics : open-channel flows	Sandra.Soares-Frazao	30h+30h	5 Credits	1q	x	
●	LG CIV2071	Geotechnics	Alain.Holeyman Ramiro.Verastegui	45h+15h	5 Credits	1q	x	
<b>○ Civil engineering project (12 credits)</b>								
●	LG CIV2011	Project 1: Building	Pierre.Latteur Thomas.Vandenbergh Ramiro.Verastegui Denis.Zastavni	30h+40h	6 Credits	1q	x	
●	LG CIV2012	Project 2 : structures <span style="background-color: yellow;">■</span>	Didier.Bousmar Bernard.Cols Alain.Holeyman Pierre.Latteur	30h+40h	6 Credits	1q	x	
<b>○ Religion courses for students in natural sciences (2 credits)</b>								
⊗	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	Marcela.Lobo	15h	2 Credits	1q	x	x

**PROFESSIONAL FOCUS [30.0]**

○ Mandatory

△ Courses not taught during 2016-2017

⊕ Periodic courses taught during 2016-2017

⊗ Optional

⊖ Periodic courses not taught during 2016-2017

■ Activity with requisites

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

Year

1 2

**○ Compulsory courses (20 credits)**

If LFSA1290 has been followed during bachelor (management minor) they have to replace it by an equivalent course.

○ LGCIV2032	<a href="#">Prestressed concrete structures</a>	<a href="#">Jean-Francois.Cap</a>	20h+15h	3 Credits	2q	x	
○ LGCIV2013	<a href="#">Hydraulics structures, bridges, roads</a>	<a href="#">Didier.Bousmar</a> <a href="#">Colette.Gregoire</a> <a href="#">Laurent.Ney</a>	45h+15h	5 Credits	2q	x	
○ LGCIV2072	<a href="#">Geotechnic Design</a>	<a href="#">Alain.Holeyman</a>	20h+15h	3 Credits	2q	x	
○ LGCIV2033	<a href="#">Metal and mixed structures</a>	<a href="#">Catherine.Doneux</a> <a href="#">Olivier.Vassart</a>	30h+30h	5 Credits	1q	x	
○ LFSA1290	<a href="#">Introduction to financial and accounting management</a>	<a href="#">Andre.Nsabimana</a> (compensates <a href="#">Gerrit.Sarens</a> ) <a href="#">Gerrit.Sarens</a>	30h+15h	4 Credits	2q	x	x

**○ Company internships (10 credits)**

Students enrolling in a 5 credit internship coupled with the graduation project (LFSA 2996) must round out their programme with a 5 credit course approved by the programme commission.

⊗ LFSA2995	<a href="#">Company Internship</a>	<a href="#">Jean-Pierre.Raskin</a>	30h	10 Credits	1 + 2q	x	x
⊗ LFSA2996	<a href="#">Company Internship</a>			5 Credits	1 + 2q	x	x

**OPTIONS**

## Majors for master in civil engineering

- > [Major in geotechnology](#) [ en-prog-2016-gce2m-igce223o ]
- > [Major in structure](#) [ en-prog-2016-gce2m-igce226o ]
- > [Major in hydraulics](#) [ en-prog-2016-gce2m-igce225o ]
- > [Major in construction and architecture](#) [ en-prog-2016-gce2m-igce227o ]

## Major in business creation and management

- > [Major in small and medium sized business creation](#) [ en-prog-2016-gce2m-lfsa221o ]
- > [Major in Business risks and opportunities](#) [ en-prog-2016-gce2m-igce228o ]

## Elective courses for the Master's degree in civil engineering

- > [Elective courses](#) [ en-prog-2016-gce2m-igce229o ]

**MAJORS FOR MASTER IN CIVIL ENGINEERING****MAJOR IN GEOTECHNOLOGY**

The goal of this major is to provide students with advanced knowledge of geotechnology. To this end, students advance their knowledge of the physical properties and the behaviour of geomaterials. Other topics studied include rock mechanics, laws governing soil dynamics and their numerical models, hydrogeology and the geological environment. The management of geotechnical risks is covered through courses on seismic shifts, environmental accidents as well as offshore geotechnology.

● Mandatory

△ Courses not taught during 2016-2017

⊕ Periodic courses taught during 2016-2017

⊗ Optional

⊙ Periodic courses not taught during 2016-2017

■ Activity with requisites

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

The student may select

De 15 à 30 credits parmi

						Year	
						1	2
⊗ LBIR1336	<a href="#">Sciences du sol</a>	<a href="#">Pierre.Delmelle (coord.)</a> <a href="#">Bruno.Delvaux</a>	30h+30h	5 Credits	2q	x	x
⊗ LBIRE2101	<a href="#">Statistical analysis of spatial and temporal data</a>	<a href="#">Patrick.Bogaert</a>	22.5h +15h	3 Credits	2q	x	x
⊗ LGCIV2073	<a href="#">Hydrogeology and Geoenvironment</a>	<a href="#">Pierre-Yves.Bolly</a> <a href="#">Alain.Holeyman</a>	40h+10h	5 Credits	2q	x	x
⊗ LGCIV2074	<a href="#">Offshore Geotechnics</a>	<a href="#">Ramiro.Verastegui</a>	20h	3 Credits	2q ⊙	x	x
⊗ LGCIV2075	<a href="#">Geosynthetics</a>	<a href="#">Marc.Demanet</a>	20h	3 Credits	2q ⊕	x	x
⊗ LGCIV2076	<a href="#">Geotechnical risks</a> ■	<a href="#">Alain.Holeyman</a> <a href="#">Jean-Francois.Vandenbergh</a>	40h+10h	5 Credits	1q	x	x
⊗ LGCIV2077	<a href="#">Soil Testing and Modelling</a>	<a href="#">Ramiro.Verastegui</a>	20h+15h	4 Credits	1q	x	x
⊗ LGCIV2101	<a href="#">Projet d'initiative</a>	<a href="#">Sandra.Soares-Fraza</a>		3 Credits		x	x

**MAJOR IN STRUCTURE**

This major seeks to provide students with additional knowledge about structural materials namely by studying the behaviour of unusual structural materials. Numerical dimensions are also covered.

● Mandatory

△ Courses not taught during 2016-2017

⊕ Periodic courses taught during 2016-2017

⊗ Optional

⊙ Periodic courses not taught during 2016-2017

■ Activity with requisites

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

*The student may select  
De 15 à 30 credits parmi*

						Year	
						1	2
⊗ LGCIV2041	<a href="#">Numerical analysis of civil engineering structures</a>	<a href="#">Jean-Francois.Remacle</a>	30h+15h	5 Credits	1q	x	x
⊗ LGCIV2042	<a href="#">Dynamics of structures</a> ■	<a href="#">Jean-Pierre.Coyette</a>	30h+30h	5 Credits	1q	x	x
⊗ LGCIV2043	<a href="#">wood structures</a>	<a href="#">Pierre.Latteur</a>	30h	3 Credits	2q	x	x
⊗ LGCIV2044	<a href="#">Structures under seismic &amp; fire conditions</a>	<a href="#">Catherine.Doneux</a> <a href="#">Olivier.Vassart</a>	20h	3 Credits	2q	x	x
⊗ LGCIV2101	<a href="#">Projet d'initiative</a>	<a href="#">Sandra.Soares-Fraza</a>		3 Credits		x	x
⊗ LICAR2841	<a href="#">Conception de l'architecture avec le bois</a>	<a href="#">Frank.Norrenberg</a>	22.5h	3 Credits	1q ⊙	x	x
⊗ LMAPR2482	<a href="#">Plasticity and metal forming</a>	<a href="#">Laurent.Delannay</a> <a href="#">Thomas.Pardoen</a>	30h +22.5h	5 Credits	2q	x	x
⊗ LMECA2520	<a href="#">Calculation of planar structures</a>	<a href="#">Issam.Doghri</a>	30h+30h	5 Credits	2q	x	x
⊗ LMECA2640	<a href="#">Mechanics of composite materials</a>	<a href="#">Issam.Doghri</a>	30h+30h	5 Credits	2q	x	x



**MAJOR IN HYDRAULICS**

The goal of this major is to provide students with additional knowledge about hydraulic materials. It focuses on the numerical aspects of hydraulics as well as rivers and groundwater bodies.

● Mandatory

△ Courses not taught during 2016-2017

⊕ Periodic courses taught during 2016-2017

⊗ Optional

⊖ Periodic courses not taught during 2016-2017

■ Activity with requisites

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

*The student may select:*

*De 15 à 21 credits parmi*

						Year	
						1	2
⊗ LGCIV2053	<a href="#">Fluvial hydraulics</a>	<a href="#">Sandra.Soares-Frazao</a>	20h+15h	4 Credits	2q	x	x
⊗ LBRES2204	<a href="#">Integrated water management of water resources</a>	<a href="#">Olivier.Cogels</a> <a href="#">Francois.Jonard</a> <a href="#">Marnik.Vanclooster</a> (coord.)	30h +22.5h	5 Credits	1q	x	x
⊗ LGCIV2054	<a href="#">Numerical simulation of transient flows</a> ■	<a href="#">Sandra.Soares-Frazao</a> <a href="#">Benoit.Spinewine</a>	20h+15h	4 Credits	1q	x	x
⊗ LGCIV2055	<a href="#">Floods and low-water level</a>	<a href="#">Sandra.Soares-Frazao</a>	20h	3 Credits	1q	x	x
⊗ LGCIV2056	<a href="#">Coastal and maritime hydraulics</a>	<a href="#">Eric.Deleersnijder</a> <a href="#">Benoit.Spinewine</a>	30h+15h	5 Credits	1q	x	x
⊗ LGCIV2101	<a href="#">Projet d'initiative</a>	<a href="#">Sandra.Soares-Frazao</a>		3 Credits		x	x
⊗ LGCIV2052	<a href="#">Hydroelectric Developments</a>	<a href="#">Sandra.Soares-Frazao</a>	20h	3 Credits	1q	x	x
⊗ LMECA2853	<a href="#">Turbulence.</a>	<a href="#">Eric.Deleersnijder</a> <a href="#">Gregoire.Winckelmans</a>	30h+30h	5 Credits	1q	x	x

**MAJOR IN CONSTRUCTION AND ARCHITECTURE**

The objective of this major is to provide students with an architectural approach to building/construction. Emphasis is placed on sustainable development, architectural design and laws governing construction.

Beginning in the 2016-2016 academic year, LAUCE2350 (Public Architecture) will be replaced by LICAR2822 (Sustainable Building 2) and LAUCE2363 (Applied Physics for Construction) will be replaced by LICAR2701 (Territorial Engineering). The classes LAUCE2370, 2371 and 2372 will become LICAR2301, 2302 and 2202.

● Mandatory

△ Courses not taught during 2016-2017

⊕ Periodic courses taught during 2016-2017

⊗ Optional

⊖ Periodic courses not taught during 2016-2017

■ Activity with requisites

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

*The student may select  
De 15 à 30 credits parmi*

						Year	
						1	2
⊗ LGCIV2101	Projet d'initiative	Sandra.Soares-Frazao		3 Credits		x	x
⊗ LICAR1304	Architecture and the City 1 [15h] (2 credits) Semester 1	Christian.Gilot	30h	3 Credits	2q	x	x
⊗ LICAR2301	Analyse et composition 1 : l'urbain	Christian.Gilot	30h	3 Credits	2q	x	x
⊗ LICAR2302	Analyse et composition 2 : les édifices	Olivier.Masson	30h	3 Credits	1q	x	x
⊗ LICAR2303	Analyse et composition 3 : le paysage	Pierre.Cloquette (compensates Jean.Stillemans) Bernard.Decleve Jean.Stillemans	30h	3 Credits	1q	x	x
⊗ LICAR2701	Ingénierie territoriale	Laurent.Ney Sandra.Soares-Frazao	45h	4 Credits	2q	x	x
⊗ LICAR2822	Edification soutenable 2 : Equipement et conception des systèmes	Magali.Bodart Sophie.Trachte Geoffrey.Vanmoeseke	50h	5 Credits	1q	x	x
⊗ LICAR2901	Droit de l'espace bâti et non bâti	Charles-Hubert.Born Christophe.Thiebaut	30h	3 Credits	1q	x	x
⊗ LICAR2911	Programming for large-scale projects	Nicolas.Vanoost	40h	4 Credits	2q ⊕	x	x
⊗ LICAR2921	Economie et politique de l'édification	Olivier.Masson David.Vanderburgh Denis.Zastavni	22.5h	2 Credits	2q ⊖	x	x

**MAJOR IN BUSINESS CREATION AND MANAGEMENT****MAJOR IN SMALL AND MEDIUM SIZED BUSINESS CREATION**

○ Mandatory

△ Courses not taught during 2016-2017

⊕ Periodic courses taught during 2016-2017

⊗ Optional

⊖ Periodic courses not taught during 2016-2017

■ Activity with requisites

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

Further information about this major may be found at <http://www.uclouvain.be/cpme>. This major may not be taken at the same time as a major in management. Students in this major may choose

De 20 à 25 credits parmi

Year

1 2

**○ Required courses for the major in small and medium sized businesses**

○ LCPME2001	<a href="#">Entrepreneurship Theory (in French)</a>	Frank.Janssen	30h+20h	5 Credits	1q	x	
○ LCPME2002	<a href="#">Managerial, legal and economic aspects of the creation of a company (in French)</a>	Regis.Coeurderoy Yves.Decordt Marine.Falize (compensates Régis Coeurderoy)	30h+15h	5 Credits	1q	x	x
○ LCPME2003	<a href="#">Business plan of the creation of a company (in French)</a>	Frank.Janssen	30h+15h	5 Credits	2q		x
○ LCPME2004	<a href="#">Advanced seminar on Entrepreneurship (in French)</a>	Roxane.DeHoe (compensates Frank Janssen) Frank.Janssen	30h+15h	5 Credits	2q	x	x

**⊗ Prerequisite CPME courses**

Students who have not taken management courses during their previous studies must enroll in LCPME2000.

○ LCPME2000	<a href="#">Venture creation financment and management I</a>	Olivier.Giacomin Paul.Vanzeveren	30h+15h	5 Credits	1q	x	
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**MAJOR IN BUSINESS RISKS AND OPPORTUNITIES**

As with most Master's degree programmes in civil engineering, the objective of this major is to familiarise students with the basic principles of business management.

○ Mandatory

△ Courses not taught during 2016-2017

⊕ Periodic courses taught during 2016-2017

⊗ Optional

⊖ Periodic courses not taught during 2016-2017

■ Activity with requisites

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

This major may not be taken at the same time as the major in small and medium sized business creation. Students enrolled in this major may select

De 16 à 20 credits parmi

Year

1 2

⊗ LFSA2140	<a href="#">Elements of law for industry and research</a>	Fernand.Devisscher Werner.Derijcke Benedicte.Inghels	30h	3 Credits	1q	x	x
⊗ LFSA2230	<a href="#">Introduction to management and to business economics</a>	Benoit.Gailly Vincent.Reuter (compensates Benoit Gailly)	30h+15h	4 Credits	2q	x	x
⊗ LFSA1290	<a href="#">Introduction to financial and accounting management</a>	Andre.Nsabimana (compensates Gerrit Sarens) Gerrit.Sarens	30h+15h	4 Credits	2q	x	x

						Year	
						1	2
⌘ LFS A2202	Ethics and ICT	Axel.Gosseries Maxime.Lambrecht (compensates Olivier Pereira) Olivier.Pereira	30h	3 Credits	2q	x	x
⌘ LFS A2245	Environment and business	Thierry.Brechet	30h	3 Credits	1q	x	x
⌘ LFS A2210	Organisation and human resources	John.Cultiaux	30h	3 Credits	2q	x	x

**⌘ Alternative to the major in business risks and opportunities for computer science students**

Computer science students who have already taken courses in this field while pursuing their Bachelor's degree may choose between 16-20 credits from the courses offered in the management minor for computer sciences.

**ELECTIVE COURSES FOR THE MASTER'S DEGREE IN CIVIL ENGINEERING****ELECTIVE COURSES**

● Mandatory

△ Courses not taught during 2016-2017

⊕ Periodic courses taught during 2016-2017

⊗ Optional

⊖ Periodic courses not taught during 2016-2017

■ Activity with requisites

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

						Year	
						1	2
⊗ LFSA2212	Innovation classes	Pierre.Latteur Benoit.Macq Benoit.Raucent	30h+15h	5 Credits	1q	x	x
⊗ LFSA2351A	Group dynamics	Piotr.Sobieski (coord.) Vincent.Wertz (coord.)	15h+30h	3 Credits	1q	x	x
⊗ LFSA2351B	Group dynamics	Piotr.Sobieski (coord.) Vincent.Wertz (coord.)	15h+30h	3 Credits	2q	x	x
⊗ LGCIV2102	Génie civil: routes (ECAM, code local RO30C)			3 Credits		x	x
⊗ LGCIV2103	Génie civil: ponts (ECAM, code local PO40T)			3 Credits		x	x
⊗ LGCIV2104	Wegen, Bruggen en tunnels (KULeuven, code local HO4L7A)			6 Credits		x	x
⊗ LGCIV2105	Industriële bouwwerken (KULeuven, code HO3R8A)			3 Credits		x	x
⊗ LMECA2410	Dynamics of elastic systems	Jean-Pierre.Coyette Laurent.Delannay	30h+30h	5 Credits	2q	x	x

**⊗ Languages**

Students may select from any language course offered at the ILV for a maximum of 3 credits out of the 120 core credits needed for their Master's degree. Special attention is placed on the following seminars in professional development:

⊗ 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	Vocational Induction Seminar - Spanish (B2.2/C1)	Paula.Lorente (coord.)	30h	3 Credits	1q	x	x
⊗ LESPA2601	Vocational Induction Seminar - Spanish (B2.2/C1)	Paula.Lorente (coord.)	30h	5 Credits	1q	x	x
⊗ 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 (coord.)	30h	3 Credits	1 ou 2q	x	x

**⊗ Other possible courses**

Students may select up to 6 credits classes in the programmes of the whole university (including humanities), except if he/she took a major in business creation and management.

**⊗ Short-term exchanges (2 credits)**

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

**⊗ General knowledge courses**

Students can also include in their curriculum any course given at UCL, KULeuven subject to approval of the Programme committee.

**⊗ Advanced courses**

Students should note that any course offered as part of their major but not taken as such may be taken as an elective course.



## Course prerequisites

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A document entitled [en-prerequis-2016-gce2m.pdf](#) specifies the activities (course units - CU) with one or more pre-requisite(s) within the study programme, that is the CU whose learning outcomes must have been certified and for which the credits must have been granted by the jury before the student is authorised to sign up for that activity.

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

As the prerequisites are a requirement of enrolment, there are none within a year of a course.

The prerequisites are defined for the CUs for different years and therefore influence the order in which the student can enrol in the programme's CUs.

In addition, when the panel validates a student's individual programme at the beginning of the year, it ensures the consistency of the individual programme:

- It can change a prerequisite into a corequisite within a single year (to allow studies to be continued with an adequate annual load);
- It can require the student to combine enrolment in two separate CUs it considers necessary for educational purposes.

For more information, please consult [regulation of studies and exams](#).

## The programme's courses and learning outcomes

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For each UCL training programme, a [reference framework of learning outcomes](#) specifies the competences expected of every graduate on completion of the programme. You can see the contribution of each teaching unit to the programme's reference framework of learning outcomes in the document "In which teaching units are the competences and learning outcomes in the programme's reference framework developed and mastered by the student?"

The document is available by clicking [this link](#) after being authenticated with UCL account.

## 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
<b>UCL Bachelors</b>			
Bachelor in engineering [180.0]	Minor in civil engineering	Direct access	Students who have neither majored nor minored in the field of their civil engineering Master's degree, must submit a written application in which they list their detailed course curriculum (list of course work and marks year by year) to the programme commission. The commission will then suggest a programme in keeping with the student's previous course of study with the possible addition of a maximum of 15 supplemental credits.
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 supplemental credits.
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<b>Others Bachelors of the French speaking Community of Belgium</b>			
Bachelor in engineering	With specific options in former institution related to civil engineering	Direct access	
Bachelor in engineering		Access with additional training	Students with a Bachelor's degree in engineering sciences (with a focus on civil engineering) who have not taken the equivalent of a minor in construction must submit a written application to the construction programme commission in which they list their detailed course curriculum (list of course work and marks



			year by year). The jury will suggest a programme in keeping with the student's previous course of study with the possible addition of a maximum of 15 supplemental credits.
<b>Bachelors of the Dutch speaking Community of Belgium</b>			
Bachelor in engineering	With specific options in former institution related to civil engineering	Direct access	
Bachelor in engineering		Access with additional training	Students who have no specialisation in construction must submit a written application to the programme commission in construction engineering in which they list their detailed course curriculum (list of course work and marks year by year). The jury will suggest a programme in keeping with the student's previous course of study with the possible addition of a maximum of 15 supplemental credits.
<b>Foreign Bachelors</b>			
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	Students will submit a written application for admission to EPL in which they list their detailed course curriculum (list of course work and marks year by year). The jury will determine whether the candidate may be admitted according to the regulations. Where necessary the jury may suggest a programme in keeping with the student's previous course of study with the possible addition of a maximum of 15 supplemental credits.

## Non university Bachelors

Diploma	Access	Remarks
> Find out more about <a href="#">links</a> to the university		
> BA en sciences industrielles - type long	Accès au master moyennant ajout de maximum 60 crédits d'enseignements supplémentaires obligatoires au programme. Voir 'Module complémentaire'	Type long

## Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks
<b>"Licenciés"</b>			

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
> MA en sciences industrielles (toutes finalités)		

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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.

Students may submit an application for admission to the Louvain School of Engineering in which they list their detailed course curriculum (list of course work and marks year by year). The School in collaboration with the relevant programme commission will determine whether the student may be admitted and their decision will respect the programme rules. When necessary, they may suggest an individualised programme consisting of a part of the elective courses in the relevant Master's degree programme in civil engineering with the possible addition of a maximum of 15 supplemental credits.

The School in collaboration with the relevant programme commission will determine whether the student may be admitted and their decision will respect the programme rules. When necessary, the jury may suggest a programme in keeping with the student's previous course of study with the possible addition of a maximum of 15 supplemental credits.

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### Admission and Enrolment Procedures for general registration

## Teaching method

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### Methods that promote multidisciplinary studies

The Master's degree programme in civil and environmental engineering (with a focus on construction) is by nature interdisciplinary. This is especially apparent in two projects: a building project completed with architectural engineering students and a structural engineering project completed with engineering students from all fields. Among the major courses, some are included in the Master's degree programmes in architectural engineering (design and architecture), physical engineering, chemistry and materials science, mechanics and bioengineering as well urban planning and sustainable development. Furthermore, students may expand their knowledge by taking elective courses in non-technical disciplines.

### Various teaching strategies

The teaching methods used in the Master's degree programme in civil and environmental engineering are consistent with that of 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.

One important teaching method is the assignment of projects that integrate several subjects. This allows students to develop the critical thinking skills necessary to design and model in a laboratory.

A major characteristic of the programme is the immersion of students in professors' research laboratories (and at times teaching laboratories, case studies, projects, theses) that expose students to advanced methods used in the discipline and allows them to learning by questioning, a process inherent in the research process.

During the 2nd semester of the 1st year of the Master's degree programme, students may participate in a two-month long company internship, which allows them to immerse themselves in the professional world.

Half of the students' workload in the last year consists of the graduation project and offers students the possibility to deal in-depth with a given subject, which given its size and context, provides a real initiation into the working life of engineers or researchers.

### Diverse learning situations

The Master's degree programme uses a variety of teaching methods depending on the discipline:

- lectures
- projects
- exercise sessions
- problem solving sessions
- case studies
- laboratories
- computer simulations
- tutoring sessions
- internships in industry or research
- visits to construction sites
- factory visits
- graduation trips
- group work
- individual work
- seminars offered by outside scientific experts

In certain cases, e-Learning allows students to work at their own pace and complete virtual experiments.

This variety of learning situations allows students to learn in an iterative and progressive manner all the while developing their autonomy as well as their organisational, time management and communication skills. Students also have access to the most up-to-date information technology (material, software, networks).

## Evaluation

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*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.

In general, student evaluations are done orally depending on the type of course:

- An oral exam based on material covered in a given course. This oral exam may be coupled with a written exam based on practical exercises. The oral exam provides students with the opportunity to dialogue their professors, allowing the latter to evaluate whether the student can clearly and convincingly present their ideas and argue in their favour.
- Regarding projects, students must schedule an oral defence of a technical report. During the defence, special attention is paid to students' communication skills.
- Some classes assign exercises, which are completed throughout the year allowing for continuous assessment of student work. The exercise results are discussed with each student. It is also expected that students will explain the steps that they took to complete the exercises thereby showing whether they truly understood the relevant concepts.

At the beginning of the semester, professors will explain their marking scheme, which is based on the learning outcomes of the course (that it frequently shares with those of the Master's degree programme).

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

To obtain a passing grade, the marks received for the teaching units are offset by their respective credits.

## Mobility and/or Internationalisation outlook

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Since its creation, the Louvain School of Engineering (EPL) has participated in diverse [exchange programs](#) that were put into place at the European level and beyond.

## Possible trainings at the end of the programme

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### Doctoral programmes

1. GraSMech-Graduate School in Mechanics
2. ENVITAM-Sciences, Technologies and Environmental management

### UCL Master's degrees (about 60) are accessible to UCL Master's degree holders

For example:

- The Master's degree (120) in sciences and environmental management and the Master's degree (60) in sciences and environmental management (automatic admission with possible complementary coursework)
- Different Master's degree programmes in management (automatic admission based on written application): see this list
- The Master's degree (60) in information and communication at Louvain-la-Neuve or the Master's degree (60) in information and communication at Mons

## Contacts

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## Curriculum Management

Entite de la structure GCE

Acronyme	<b>GCE</b>
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 ( <a href="#">SST</a> )
Institut	Institute of Mechanics, Materials and Civil Engineering ( <a href="#">IMMC</a> )
Pôle	Civil and environmental engineering ( <a href="#">GCE</a> )

**Academic Supervisor :** [Sandra SOARES FRAZAO](#)

## Jury

Président du Jury : [Jean-Didier LEGAT](#)

Secrétaire du Jury : [Sandra SOARES FRAZAO](#)

## Usefull Contacts

Secrétariat : [Viviane DELMARCELLE](#)

