UCLouvain

INFO2M

2024 - 2025

Master [120] in Computer Science and Engineering

⚠ *The version you're consulting is not definitive. This programme still may change. The final version will be published on 1th June.*

At Louvain-la-Neuve - 120 credits - 2 years - Day schedule - In English
Dissertation/Graduation Project : **YES** - Internship : **optional**
Activities in English: **YES** - Activities in other languages : **optional**
Activities on other sites : **NO**
Main study domain : **Sciences de l'ingénieur et technologie**
Organized by: **Louvain School of Engineering (EPL)**
Programme acronym: **INFO2M** - Francophone Certification Framework: 7

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INFO2M - Introduction

Introduction

Introduction

This Master's degree programme strikes a balance between "soft skills" and scientific/technical skills as well as between high quality research and practical field work. It offers

- the study of computer science based on fundamental concepts, the value of which goes beyond rapidly evolving technology;
- a programme taught entirely in English to improve students' language skills (technical written and spoken English);
- exchange programs and dual degrees in Belgium, Europe and throughout the world.

As with the Bachelor's degree in civil engineering, this programme seeks to train well-rounded engineers by offering majors in related disciplines such as applied math, or electronics and communication.

Your profile

You would like to

- **imagine, design and implement** computer systems that will shape the future;
- **focus on computer science and engineering** after having studied science and technology (math, mechanics, electricity, chemistry, etc.) as an undergraduate student;
- improve your **theoretical knowledge** and develop technical skills;
- increase your **interdisciplinary knowledge** in areas such as foreign languages, resource management, teamwork, autonomy and ethics;
- expand your training to include management and small and medium sized business creation;
- take advantage of a programme taught entirely in **English**.

Your future job

We train

- **scientists** who know how to investigate a sharp problematic using scientific literrature in the field;
- **professionals** who will design information systems that correspond to user needs;
- **innovators** who can master a wide range of technology and record its progress;
- **specialists** capable of implementing software solutions with particular attention to product quality and the development process.

Your programme

This Master's degree consists of:

- a **compulsory part** providing the knowledge necessary to model and design complex applications
- a major of your choice that allows you to acquire cutting edge knowledge in an area of interest
- at the heart of computer sciences: **artificial intelligence, computer networks, cryptography and information security, software engineering, and system programming**;
- at the frontier with other engineering sciences: **communication networks, applied mathematics and data science, biomedical engineering, and bioinformatics**;
- beyond computer science: **management and small and medium sized business creation**;
- **elective courses** that allow you to focus your training on your areas of interest, whether they be computer science or any other discipline (electricity, management, business creation, languages);
- a **graduation project** (representing half your workload during the last year) offers the possibility to discuss a subject in-depth. Due to its size and scope, this project allows for an initiation into the working life of computer scientists and/or researchers. The project's subject is selected in consultation with the programme heads and possibly a company.

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INFO2M - Teaching profile

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Learning outcomes

Designers and developers of tomorrow's computer systems are confronted with two major challenges:

- computer systems that are increasingly complex
- areas of application that are increasingly varied

To meet these challenges, the future Master's degree holder in computer science must:

- master current computer science technologies but also manage and ascertain their progress,
- innovate by integrating elements linked to artificial intelligence, software engineering and security networks into computer systems,
- work as a member of an multidisciplinary team and act as an interface between the development team and other participants involved in the scientific or technical issues of the project.

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

- a professional engineer capable of integrating several scientific and technical disciplines in the area of information technology
- an individual with field experience, capable of putting his/her knowledge into practice and use ever evolving high performance tools (both in research and technology)
- a specialist having acquired cutting edge knowledge in his/her field of study, for example artificial intelligence, security networks, software engineering and programming systems
- a manager who manages team projects

Polytechnic and multidisciplinary, the training offered by the Louvain School of Engineering (EPL) emphasises a combination of theory and practice open to computer science in all its dimensions (analysis, design, development, implementation, maintenance, research and innovation) including those pertaining to ethics.

International possibilities:

English is the most widely used language in companies particularly those in the technical sector. This Master's degree programme is thus taught in English and provides its participants with the opportunity to acquire solid oral and written English language skills. Offering a Master's degree in English, is proof of our international status. The use of English allows us to welcome international students all the while allowing these students to be immersed in a francophone environment. It also includes exchange programs and dual diplomas with foreign universities.

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

1. demonstrate their mastery of a **solid body of knowledge and skills** in computer science allowing them to solve problems associated with their field of study

1.1. Confronted with a computer science problem, diploma holders **can identify concepts, algorithms, and applicable data structures** to find a solution and can break the problem down into its component parts in order to formulate computer-based problem solving methods.

1.2. Confronted with a problem in their field of study, diploma holders can **choose the proper problem solving tools** (for example, development environment, programming language, software and software packages) that will allow them to find the correct software solution to the problem in question.

1.3. Confronted with the results obtained through reasoning as well as the use of tools and concepts, diploma holders are able to step back and ascertain the relevance and the quality of their results. To do so, diploma holders develop tests and relevant checks to **ensure they have developed quality solutions**.

2. organise and **develop a computer system** that meets the complex needs of a client

2.1. Before working on a solution, **graduates explore and analyse all aspects of a problem** using the documentation at their disposal and consult with future system users. Graduates then will produce a specifications note that describes not only the system requirements but also its time constraints and ease of use for future users.

2.2. In the design phase, graduates will **imagine and model the computer system under development** in terms of functional components (subsystems) in such a way as to facilitate and optimise development. They will capitalise on the available technology and programme verification methods to ensure the quality of the software system from the very beginning of the design stage.

2.3. In the analysis phase, graduates will itemise, **evaluate and compare different technologies** (material, languages, algorithms, routing) with the goal of prioritising those that best correspond to different performance and quality criteria specified in the specifications note.

2.4. In the implementation stage, graduates will demonstrate *their mastery of the principles, techniques and development tools* at their disposal. They will create a software prototype in order to verify that the software corresponds to the clients' needs and will run a battery of tests to ensure that the proposed solution corresponds to the specifications note. By applying validation techniques and programme verifications, graduates can identify and locate bugs as well as their fixes.

2.5. On the basis of a prototype, **graduates design and ensure follow up through a quality control plan**: monitoring, optimisation, maintenance, detection of break downs, communication protocols and intervention in the case of failure. They can use metrics and tools to evaluate and validate the structural quality of a software system in terms of its security and maintainability.

3. organise and carry out a research project to **understand a new problem** in their area of study

3.1. Confronted with a new computer problem, graduates will **explore** the area in question and obtain the necessary information to **complete a situational analysis** using the various resources at their disposal (library, Internet, researchers, industry experts)

3.2. In the graduation project (possibly paired with a company internship) on a new problem, graduates **construct a model** of the underlying phenomenon from a computer science perspective. On the basis of this model, **graduates formulate and test different computer devices capable of solving the problem in question** (for example, computerised processing of an image by a scanner to facilitate medical diagnosis)

3.3. Once in possession of the experimental results, graduates summarise their conclusions in a report, where they also discuss **how key variables influenced the behaviour of the phenomenon being studied**. Based on their results, graduates will make recommendations about how to **develop and implement innovative technical solutions f**or the problems in question.

4. Participate in a group project

4.1. As a member of a team project, graduates will collaborate to study a problem and its context with the goal or itemising its different parts, issues and constraints. They will then collaborate **to draft a specifications note reiterating the key elements of the project framework:** problem and solution, objectives and performance indicators, risks, deadlines, resource limits, etc.

4.2. Once the project framework is defined, graduates **collaborate on a plan of action**. The team agrees to work collectively on a work schedule, the intermediary steps, the division of labour and project deadlines.

4.3. Team members share their knowledge and skills **to solve problems collectively** that are raised over the course of the project whether they are technical or not. Graduates are able to step back when necessary to overcome team difficulties or conflicts:

4.4. Mindful of the commitments made during the course of the project, graduates alert their teammates about decisions that need to be made in the event of a problem. Through steering committee meetings, graduates **make the necessary decisions** to organise or reorganise project objectives.

5. Communicate effectively orally and in writing with the goal of carrying out projects (in particular in English)

5.1. Faced with a computer development project, graduates are able to identify and question the relevant actors. **Through their exchanges with those involved in the project, graduates assess the project environment and relevant issues**, which requires them to specify their needs, expectations and limits in a specifications note while keeping in mind system functionalities as well as the conditions for use (interfaces with other applications, maintenance, progress, etc.)

5.2. By communicating, **graduates take into account the fact that their interlocutors have not necessarily mastered the language of computers** and do not have the same idea of the issues and solutions envisaged by computer science.

5.3. In certain critical phases of a project, there are collective choices to be made. To facilitate decision making, the graduate must **be capable of providing his/her interlocutors with a summary of the situation and its issues**. To this end, he/she is capable of communicating necessary information by using schemas or graphs of the computer system.

5.4. Graduates know how to use reference materials or computer language or software manuals in both English and French. They **understand technical reports written in English**.

5.5. During the development of a computer application, graduates **can ensure the tracking and documentation in a concise and precise language**: specifications note, software structures and their related data, operating modes. Graduates are also capable of drafting summary reports that describe their design and technology choices.

6. Demonstrate autonomy, rigor, openness, critical thinking as well as a sense of ethics when doing your job

6.1. In their fields of study, students **master the technical vocabulary and usage standards** that allow them to easily understand a scientific article or technical document or to communicate with specialists in their field.

6.2. Graduates will take into account the socio-economic aspects of a project in the specifications note, in particular the compatibility between technological progress and ethical standards

6.3. Regarding the development of an application that meets an industrial challenge or provides an important service (for example ambulance management), **graduates will ensure the robustness and feasibility** of the application for its users.

6.4. Confronted with a new problem**, graduates autonomously acquire and use information and computer tools that they need to solve the problem** even if they have not explicitly learned about them during their coursework.

Programme structure

The Master's degree programme consists of four parts:

- Core curriculum, focused on the graduation project (35 credits)
- Required final specialisation, mandatory training (30 credits)
- One or more majors allowing you to specialize in a field of computer science (20 to 55 credits)
- Elective courses (0 to 55 credits)

The graduation project is normally completed in the last annual block. 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. The yearly distribution of activities as outlined in the detailed programme is subject to change.

Furthermore, students have the opportunity to broaden their education by enrolling in non-technical elective courses if they have a clear objective in mind.

INFO2M Programme

Detailed programme by subject

CORE COURSES [35.0]

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

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

					Year	
					1	2
❂ LINFO2990	Graduation project/End of studies project *The graduation project can be written and presented in French or English, in consultation with the supervisor. It may be accessible to exchange students by prior agreement between the supervisors and/or the two universities.*			EN [q1+q2] [] [25 Credits] ⊛		x
❂ LELEC2531	Electronic digital systems			EN [q1] [30h+30h] [5 Credits] ⊕ > *French-friendly*	x	x
❂ LEPL2020	Professional integration work *The modules of LEPL2020 course are organized over the two years of the master's degree. It is strongly recommended that students take them from year 1, but they will only be able to register for the course at the earliest the year in which they present their final graduation project.* *Students who have other professional integration activities in their personal programme, or who can demonstrate an equivalent activity could be exempted from this course. This equivalence is at the discretion of the programme commission jury. Another activity should then be chosen to reach the number of ECTS required for their graduation.*			EN [q1+q2] [30h+15h] [2 Credits] ⊕ > *French-friendly*	x	x

❂ Computer science seminars
Students may choose 3 credits among
The student shall select 3 credits from amongst

					Year	
❈ LINFO2349	Networking and security seminar	Etienne Riviere Ramin Sadre	EN [q1] [30h] [3 Credits] ⊕ > *French-friendly*			x
❈ LINFO2359	Software engineering and programming systems seminar	Axel Legay	EN [q1] [30h] [3 Credits] ⊕ > *French-friendly*			x
❈ LINFO2369	Artificial intelligence and machine learning seminar		EN [q1] [30h] [3 Credits] ⊕ > *French-friendly*			x

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
1 2

⭘ *Content:*

⭘ **Computer science courses**

				Year 1	Year 2
⭘ LINFO2132	Languages and translators	Ramin Sadre	EN [q2] [30h+30h] [6 Credits] 🌐 > *French-friendly*	x	x
⭘ LINFO2172	Databases		EN [q2] [30h+30h] [6 Credits] 🌐 > *French-friendly*	x	x
⭘ LINFO2241	Architecture and performance of computer systems	Tom Barbette	EN [q1] [30h+30h] [6 Credits] 🌐 > *French-friendly*	x	x
⭘ LINFO2255	Software engineering project	Axel Legay	EN [q1] [30h+30h] [6 Credits] 🌐 > *French-friendly*	x	x
⭘ LINFO2262	Machine Learning :classification and evaluation	Pierre Dupont	EN [q2] [30h+30h] [6 Credits] 🌐 > *French-friendly*	x	x

OPTIONS [52.0]

The student must choose one or more options from the following sections. In the section "Options and elective courses in socio-economic knowledge", the student validates one of the two options or chooses at least 3 credits from among the elective courses or the courses of the option in business issues.

Majors for the Master's degree in computer science and engineering

> Major in Artificial Intelligence: big data, optimization and algorithms   *[en-prog-2024-info2m-linfo301o]*
> Major in software engineering and programming systems   *[en-prog-2024-info2m-linfo302o]*
> Major in Data science and Applied Mathematics   *[en-prog-2024-info2m-linfo304o]*
> Option en Cryptography and information security   *[en-prog-2024-info2m-linfo305o]*
> Major in biomedical engineering   *[en-prog-2024-info2m-linfo307o]*
> Option en Cybersecurity   *[en-prog-2024-info2m-linfo309o]*
> Option Networks and systems   *[en-prog-2024-info2m-linfo319o]*
> Option en Informatique médicale   *[en-prog-2024-info2m-linfo329o]*
> Cours au choix disciplinaires   *[en-prog-2024-info2m-linfo237o]*

Options et cours au choix en connaissances socio-économiques

> Business risks and opportunities   *[en-prog-2024-info2m-linfo233o]*
> Major in Interdisciplinary Program in Entrepreneurship - INEO   *[en-prog-2024-info2m-linfo232o]*
> Cours au choix en connaissances socio-économiques   *[en-prog-2024-info2m-linfo200o]*

Others elective courses

> Others elective courses   *[en-prog-2024-info2m-linfo958o]*

MAJORS FOR THE MASTER'S DEGREE IN COMPUTER SCIENCE AND ENGINEERING

Students have to choose one or several options among:

MAJOR IN ARTIFICIAL INTELLIGENCE: BIG DATA, OPTIMIZATION AND ALGORITHMS

Students completing the major in artificial intelligence: big data, optimization and algorithms will be able to: Identify and use methods and techniques that create software-based solutions to complex problems, Understand and put to good use the methods and techniques pertaining to artificial intelligence such as automated reasoning, heuristic research, knowledge acquisition, automated learning, problems related to constraint satisfaction, Identify a category of applications and how to use its methods and tools; understand specific categories of applications and their specific techniques-for example computer vision, scheduling, data mining, natural language processing, bioinformatics, big data processing; Formalise and structure a body of complex knowledge by using a systematic and rigorous approach to develop quality "intelligent" systems.

- ○ 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...)

Students shall select 20 to 30 credits among

					Year 1	Year 2

○ Content:

○ Required courses in Artificial Intelligence: big data, optimization and algortihms

	Code	Title	Teacher	Details	Y1	Y2
○	LINFO2263	Computational Linguistics	Pierre Dupont	[EN] [q1] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x
○	LINFO2266	Advanced Algorithms for Optimization	Pierre Schaus	[EN] [q1] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x
○	LINFO2365	Constraint programming	Pierre Schaus	[EN] [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x
○	LINFO2364	Mining Patterns in Data		[EN] [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x

⊗ Elective courses in Artificial Itelligence
Student shall select 10 credits among

	Code	Title	Teacher	Details	Y1	Y2
⊗	LELEC2870	Machine learning : regression, deep networks and dimensionality reduction	John Lee Michel Verleysen	[EN] [q1] [30h+30h] [5 Credits] ⊕ > *French-friendly*	x	x
⊗	LELEC2885	Image processing and computer vision	Christophe De Vleeschouwer (coord.) Laurent Jacques	[EN] [q1] [30h+30h] [5 Credits] ⊕ > *French-friendly*	x	x
⊗	LGBIO2010	Bioinformatics	Pierre Dupont	[EN] [q1] [30h+30h] [5 Credits] ⊕ > *French-friendly*	x	x
⊗	LINFO2145	Cloud Computing	Etienne Riviere	[EN] [q1] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x
⊗	LINMA1691	Discrete mathematics - Graph theory and algorithms	Vincent Blondel Jean-Charles Delvenne	[FR] [q1] [30h+22.5h] [5 Credits] ⊕	x	x
⊗	LINMA1702	Optimization models and methods I	François Glineur	[FR] [q2] [30h+22.5h] [5 Credits] ⊕	x	x
⊗	LINMA2450	Combinatorial optimization	Julien Hendrickx Geovani Nunes Grapiglia	[EN] [q1] [30h+22.5h] [5 Credits] ⊕ > *French-friendly*	x	x
⊗	LINMA2472	Algorithms in data science	Vincent Blondel Jean-Charles Delvenne (coord.)	[EN] [q1] [30h+22.5h] [5 Credits] ⊕ > *French-friendly*	x	x
⊗	LINFO2275	Data mining & decision making	Marco Saerens	[EN] [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x

Year

				1	2
✿ LINFO2381	Health Informatics	Sébastien Jodogne	[q2] [30h+30h] [5 Credits] ⊕ > *French-friendly*	x	x

MAJOR IN SOFTWARE ENGINEERING AND PROGRAMMING SYSTEMS

Student completing the major in Software Engineering and Programming Systems will be able to: Understand and explain problems pertaining to large scale software projects as well as the critical impact of their solutions throughout the duration of the project (construction scope, validation, documentation, communication and large scale project management as well as expense limits and deadlines), Choose and apply engineering methods and tools related to complex software systems to meet strict quality control criteria: reliability, adaptability, upgradeability, performance, security, usability), Model products and processes necessary to obtain such systems and analyse the models in question, Design and create programmes to analyse, convert and optimise computer performance, Put to good use different programming language paradigms, in particular those that deal with competing functional and object oriented programmes, Understand the issues associated with different competing programming models and use the appropriate model, Define a new language (syntax and semantics) appropriate to a specific context.

- 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...)

Students shall select 20 to 30 credits among

Year
1 2

o *Content:*

o Required courses in software engineering and programming systems

O LINFO2143	Concurrent systems : models and analysis	Charles Pecheur	[EN] [q1] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x
O LINFO2251	Software Quality Assurance		[EN] [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x
O LINFO2252	Software Maintenance and Evolution	Kim Mens	[EN] [q1] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x
O LINFO2345	Languages and algorithms for distributed Applications	Peter Van Roy	[EN] [q1] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x

⊗ Elective courses in Software Engineering and Programming Systems
Students can select 10 credits among

⊗ LINFO2145	Cloud Computing	Etienne Riviere	[EN] [q1] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x
⊗ LINFO2347	Computer system security	Ramin Sadre	[EN] [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x
⊗ LINFO2355	Multicore programming	Etienne Riviere	[EN] [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x
⊗ LINFO2364	Mining Patterns in Data		[EN] [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x
⊗ LINFO2365	Constraint programming	Pierre Schaus	[EN] [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x
⊗ LINFO2335	Programming paradigms	Kim Mens	[EN] [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x
⊗ LINFO2381	Health Informatics	Sébastien Jodogne	[EN] [q2] [30h+30h] [5 Credits] ⊕ > *French-friendly*	x	x
⊗ LINFO2382	Computer supported collaborative work	Jean Vanderdonckt	[EN] [q1] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x

MAJOR IN DATA SCIENCE AND APPLIED MATHEMATICS

This major is available only to students who majored or minored in Applied Mathematics during their bachelor's degree programme. Students completing the major Computing and Applied Mathematics will be able to: Understand both applied mathematics and computing including algorithms, scientific calculations, computer system modelling, optimisation, automated learning or data mining, Understand and use the methods and techniques related to advanced algorithms such as optimisation methods, constraint programming, algorithms of graphs, numerical algorithms or analysis and design of algorithms, Identify and use models and techniques relating to statistics, automated learning and data mining; understand categories of applications used for the processing of raw data as well as automatic forms used to mine information out of large data sets.

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...)

The student shall select 20 to 30 credits among

					Year
					1 2

o Content:

o Required courses in Data Science and Applied Mathematics (20 credits)

					Year 1	Year 2
O LINMA2472	Algorithms in data science	Vincent Blondel Jean-Charles Delvenne (coord.)	EN [q1] [30h+22.5h] [5 Credits] 🌐 > *French-friendly*	x	x
O LINMA2710	Scientific computing	Pierre-Antoine Absil	EN [q2] [30h+22.5h] [5 Credits] 🌐 > *French-friendly*	x	x
O LINFO2275	Data mining & decision making	Marco Saerens	EN [q2] [30h+15h] [5 Credits] 🌐 > *French-friendly*	x	x
O LINFO2364	Mining Patterns in Data		EN [q2] [30h+15h] [5 Credits] 🌐 > *French-friendly*	x	x

⊗ Elective courses in Data Science and applied mathematics
Student shall select max. 10 credits among

					Year 1	Year 2
⊗ LELEC2870	Machine learning : regression, deep networks and dimensionality reduction	John Lee Michel Verleysen	EN [q1] [30h+30h] [5 Credits] 🌐 > *French-friendly*	x	x
⊗ LINFO2266	Advanced Algorithms for Optimization	Pierre Schaus	EN [q1] [30h+15h] [5 Credits] 🌐 > *French-friendly*	x	x
⊗ LELEC2348	Information theory and coding [TM]		EN [q2] [30h+15h] [5 Credits] 🌐 > *French-friendly*	x	x
⊗ LINFO2365	Constraint programming	Pierre Schaus	EN [q2] [30h+15h] [5 Credits] 🌐 > *French-friendly*	x	x
⊗ LINFO2381	Health Informatics	Sébastien Jodogne	EN [q2] [30h+30h] [5 Credits] 🌐 > *French-friendly*	x	x
⊗ LINMA2450	Combinatorial optimization	Julien Hendrickx Geovani Nunes Grapiglia	EN [q1] [30h+22.5h] [5 Credits] 🌐 > *French-friendly*	x	x
⊗ LINMA2470	Stochastic modelling	Philippe Chevalier	EN [q2] [30h+22.5h] [5 Credits] 🌐 > *French-friendly*	x	x
⊗ LINMA2471	Optimization models and methods II	François Glineur Geovani Nunes Grapiglia	EN [q1] [30h+22.5h] [5 Credits] 🌐 > *French-friendly*	x	x
⊗ LMAT2450	Cryptography	Olivier Pereira	EN [q1] [30h+15h] [5 Credits] 🌐 > *French-friendly*	x	x
⊗ LMECA2170	Numerical Geometry		EN [q1] [30h+30h] [5 Credits] 🌐 > *French-friendly*	x	x

OPTION EN CRYPTOGRAPHY AND INFORMATION SECURITY

This major is available only to students who majored or minored in Electricity during their Bachelor's degree programme. Students completing the major Communication Networks will be able to: Understand and use different devices and protocols used in fixed and wireless networks, Design, configure and manage fixed and wireless networks while taking into account application needs (including multimedia), Understand and effectively use information coding techniques, Understand and design mobile wireless communication systems from start to finish.

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

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

Year

1 2

⊙ *Content:*

⌗ **Elective courses**
In order to validate this option INFO and MAP students have to take 20 credits at least and ELEC and DATA students 15 credits at least among:

⌗ LELEC2760	Secure electronic circuits and systems	François-Xavier Standaert	[EN] [q2] [30h+30h] [5 Credits] 🌐 > *French-friendly*	x	x
⌗ LINFO2144	Secured systems engineering	Axel Legay	[EN] [q2] [30h+15h] [5 Credits] 🌐 > *French-friendly*	x	x
⌗ LINFO2347	Computer system security	Ramin Sadre	[EN] [q2] [30h+15h] [5 Credits] 🌐 > *French-friendly*	x	x
⌗ LELEC2348	Information theory and coding [TM]		[EN] [q2] [30h+15h] [5 Credits] 🌐 > *French-friendly*	x	x
⌗ LMAT2440	Number theory	Pierre-Emmanuel Caprace Olivier Pereira	[EN] [q1] [30h+15h] [5 Credits] 🌐 > *English-friendly*	x	x
⌗ LMAT2450	Cryptography	Olivier Pereira	[EN] [q1] [30h+15h] [5 Credits] 🌐 > *French-friendly*	x	x
⌗ LELEC2770	Privacy Enhancing technology	Olivier Pereira François-Xavier Standaert	[EN] [q1] [30h+30h] [5 Credits] 🌐 > *French-friendly*	x	x

MAJOR IN BIOMEDICAL ENGINEERING

This major is available only to students who minored in biomedical engineering during their Bachelor's degree programme. The objective of the biomedical engineering major is to train engineers who are capable of meeting future technological challenges in the scientific and technical fields related to biomedical engineering. This major provides students with basic knowledge about bioinformatics as well as other biomedical engineering fields such as bioinstrumentation, biomaterials, medical imaging, mathematical modelling, artificial organs and rehabilitation and biomechanics. The collaboration between the Louvain School of Management and the School of Medicine provides an interdisciplinary curriculum where engineering is applied to the complex and varied biomedical field.

- 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...)

Students shall select 20 to 30 credits among:

					Year	
					1	**2**

O Content:

O Required courses in biomedical engineering

					1	2
⌘ LGBIO2010	Bioinformatics	Pierre Dupont	[q1] [30h+30h] [5 Credits] ⊕ *> French-friendly*		x	x
⌘ LGBIO2020	Bioinstrumentation	André Mouraux Michel Verleysen	[q2] [30h+30h] [5 Credits] ⊕ *> French-friendly*		x	x
⌘ LGBIO2030	Biomaterials	Sophie Demoustier Christine Dupont	[q1] [30h+30h] [5 Credits] ⊕ *> French-friendly*		x	x
⌘ LGBIO2040	Biomechanics	Greet Kerckhofs	[q2] [30h+30h] [5 Credits] ⊕ *> French-friendly*		x	x
⌘ LGBIO2050	Medical Imaging		[q1] [30h+30h] [5 Credits] ⊕ *> French-friendly*		x	x
⌘ LGBIO2060	Modelling of biological systems	Philippe Lefèvre	[q1] [30h+30h] [5 Credits] ⊕ *> French-friendly*		x	x
⌘ LGBIO2072	Mathematical models in neuroscience	Frédéric Crevecoeur	[q1] [30h+30h] [5 Credits] ⊕ *> French-friendly*		x	x
⌘ LINFO2381	Health Informatics	Sébastien Jodogne	[q2] [30h+30h] [5 Credits] ⊕ *> French-friendly*		x	x

OPTION EN CYBERSECURITY

Students who have completed the "Cybersecurity and Information Technology" track should be able to:

• Understand areas of engineering that require synergy between computer security, networks, and systems, such as cryptography, data protection, application security, security architecture, or programming,

• Comprehend and appropriately apply methods and techniques related to cybersecurity, including prevention, detection, and response to cyber threats,

• Identify and implement security practices and standards to protect the infrastructure, systems, and data of organizations,

• Apply their knowledge to real-life scenarios through projects.

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...)

Students shall select 20 to 30 credits among:

		Year
		1 2

O *Content:*

Students shall select 20 to 30 credits among:

O **Required courses in Cybersecurity**

					Year 1	Year 2
O LINFO2347	Computer system security	Ramin Sadre	EN [q2] [30h+15h] [5 Credits] 🌐 > *French-friendly*		x	x
O LINFO2145	Cloud Computing	Etienne Riviere	EN [q1] [30h+15h] [5 Credits] 🌐 > *French-friendly*		x	x
O LINFO2144	Secured systems engineering	Axel Legay	EN [q2] [30h+15h] [5 Credits] 🌐 > *French-friendly*		x	x
O LELEC2770	Privacy Enhancing technology	Olivier Pereira François-Xavier Standaert	EN [q1] [30h+30h] [5 Credits] 🌐 > *French-friendly*		x	x

O **Elective courses in Cybersecurity**

					Year 1	Year 2
⊠ LINFO2143	Concurrent systems : models and analysis	Charles Pecheur	EN [q1] [30h+15h] [5 Credits] 🌐 > *French-friendly*		x	x
⊠ LMAT2450	Cryptography	Olivier Pereira	EN [q1] [30h+15h] [5 Credits] 🌐 > *French-friendly*		x	x
⊠ LINFO2142	Computer networks: configuration and management	Olivier Bonaventure	EN [q1] [30h+30h] [5 Credits] 🌐 > *French-friendly*		x	x
⊠ LINFO2146	Mobile and Embedded Computing	Ramin Sadre	EN [q2] [30h+15h] [5 Credits] 🌐 > *French-friendly*		x	x
⊠ LINFO2345	Languages and algorithms for distributed Applications	Peter Van Roy	EN [q1] [30h+15h] [5 Credits] 🌐 > *French-friendly*		x	x
⊠ LELEC2348	Information theory and coding [TM]		EN [q2] [30h+15h] [5 Credits] 🌐 > *French-friendly*		x	x
⊠ LINFO2315	Design of Embedded and real-time systems	Cristel Pelsser	EN [q2] [30h+30h] [5 Credits] 🌐 > *French-friendly*		x	x
⊠ LINFO2381	Health Informatics	Sébastien Jodogne	EN [q2] [30h+30h] [5 Credits] 🌐 > *French-friendly*		x	x

OPTION NETWORKS AND SYSTEMS

Students who have completed the "Networks and Systems" track should be able to:

- Understand and explain different devices and protocols used in computer and cellular networks;
- Design, configure and manage computer networks while taking into account application needs;
- Understand the operation of IoT and cellular networks;
- Explain the problems that affect cellular and IoT networks and develop solutions to cope with them;
- Understand how to optimise applications to efficiently use parallel cores;
- Understand, implement and use lock-free data structures;
- Understand the interactions between real-time operating systems and hardware;
- Design and implement applications running on embedded systems

- ⬡ 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...)

Students shall select 20 to 30 credits among:

Year
1 2

⬡ Content:

⬡ Required courses in Networks and systems

					1	2
⬡ LINFO2142	Computer networks: configuration and management	Olivier Bonaventure	[EN] [q1] [30h+30h] [5 Credits] ⊕ > *French-friendly*		x	x
⬡ LINFO2146	Mobile and Embedded Computing	Ramin Sadre	[EN] [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*		x	x
⬡ LINFO2315	Design of Embedded and real-time systems	Cristel Pelsser	[EN] [q2] [30h+30h] [5 Credits] ⊕ > *French-friendly*		x	x
⬡ LINFO2355	Multicore programming	Etienne Riviere	[EN] [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*		x	x

⬡ Elective courses in Networks and Systems

					1	2
✖ LINFO2347	Computer system security	Ramin Sadre	[EN] [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*		x	x
✖ LINFO2145	Cloud Computing	Etienne Riviere	[EN] [q1] [30h+15h] [5 Credits] ⊕ > *French-friendly*		x	x
✖ LINFO2144	Secured systems engineering	Axel Legay	[EN] [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*		x	x
✖ LINFO2143	Concurrent systems : models and analysis	Charles Pecheur	[EN] [q1] [30h+15h] [5 Credits] ⊕ > *French-friendly*		x	x
✖ LINFO2345	Languages and algorithms for distributed Applications	Peter Van Roy	[EN] [q1] [30h+15h] [5 Credits] ⊕ > *French-friendly*		x	x
✖ LINFO2381	Health Informatics	Sébastien Jodogne	[EN] [q2] [30h+30h] [5 Credits] ⊕ > *French-friendly*		x	x
✖ LELEC2760	Secure electronic circuits and systems	François-Xavier Standaert	[EN] [q2] [30h+30h] [5 Credits] ⊕ > *French-friendly*		x	x

OPTION EN INFORMATIQUE MÉDICALE

Students completing the major in "Health informatics" will be able to:

- Identify and use methods and techniques that provide software-based solutions to complex problems encountered in hospitals, in bio-pharmaceutical environments, in life sciences, or in digital health.
- Take part in multidisciplinary projects bringing together medical, biological and engineering expertise to the benefit of patient health.
- Understand and put to good use the methods and techniques pertaining to medical informatics and bioinformatics, such as artificial intelligence, health interoperability, clinical knowledge structuring, applied statistics, information security, software quality, as well as the effective management and processing of large volumes of data.
- Understand specific categories of applications where these methods and techniques can be applied, such as diagnostic support, therapeutic assistance, hospital information systems, medical and biomedical imaging, smart devices, clinical trials, health data mining, as well as automated processing of the medical language.
- Formalize and structure a body of complex knowledge by using a systematic and rigorous approach to the development of high-quality medical and biomedical information systems.

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...)

Students shall select 20 to 30 credits among:

					Year
					1 2

O **Content:**

O **Cours obligatoires en Informatique médicale**

					Year 1	Year 2
O LGBIO2050	Medical Imaging		EN [q1] [30h+30h] [5 Credits] ⊕ > *French-friendly*		x	x
O LGBIO2010	Bioinformatics	Pierre Dupont	EN [q1] [30h+30h] [5 Credits] ⊕ > *French-friendly*		x	x
O LINFO2381	Health Informatics	Sébastien Jodogne	EN [q2] [30h+30h] [5 Credits] ⊕ > *French-friendly*		x	x
O LSTAT2330	Statistics in clinical trials.		EN [q2] [22.5h+7.5h] [5 Credits] ⊕		x	x

O **Cours aux choix en Informatique médicale**

					Year 1	Year 2
⌗ LDATA2010	Information visualisation	John Lee	EN [q1] [30h+30h] [5 Credits] ⊕ > *French-friendly*		x	x
⌗ LELEC2770	Privacy Enhancing technology	Olivier Pereira François-Xavier Standaert	EN [q1] [30h+30h] [5 Credits] ⊕ > *French-friendly*		x	x
⌗ LEPL2210	Ethics and ICT	Axel Gosseries Olivier Pereira	EN [q2] [30h] [3 Credits] ⊕ > *French-friendly*		x	x
⌗ LGBIO2020	Bioinstrumentation	André Mouraux Michel Verleysen	EN [q2] [30h+30h] [5 Credits] ⊕ > *French-friendly*		x	x
⌗ LGBIO2060	Modelling of biological systems	Philippe Lefèvre	EN [q1] [30h+30h] [5 Credits] ⊕ > *French-friendly*		x	x
⌗ LGBIO2072	Mathematical models in neuroscience	Frédéric Crevecoeur	EN [q1] [30h+30h] [5 Credits] ⊕ > *French-friendly*		x	x
⌗ LGBIO2110	Introduction to Clinical Engineering		EN [q2] [30h] [3 Credits] ⊕ > *French-friendly*		x	x
⌗ LINFO2251	Software Quality Assurance		EN [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*		x	x
⌗ LINFO2263	Computational Linguistics	Pierre Dupont	EN [q1] [30h+15h] [5 Credits] ⊕ > *French-friendly*		x	x
⌗ LINFO2347	Computer system security	Ramin Sadre	EN [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*		x	x
⌗ LINFO2364	Mining Patterns in Data		EN [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*		x	x
⌗ LINFO2401	Open Source strategy for software development		EN [q1] [30h+15h] [5 Credits] ⊕ > *French-friendly*		x	x

					Year	
					1	**2**
❊ LINMA2472	Algorithms in data science	Vincent Blondel Jean-Charles Delvenne (coord.)	EN [q1] [30h+22.5h] [5 Credits] ⊕ > *French-friendly*		x	x
❊ LMAT2450	Cryptography	Olivier Pereira	EN [q1] [30h+15h] [5 Credits] ⊕ > *French-friendly*		x	x
❊ WESP2123	Principles of clinical trials	Diego Castanares Zapatero Philippe Lysy Annie Robert (coord.) Françoise Smets	EN [q1] [20h+10h] [4 Credits] ⊕		x	x
❊ WFARM2177	Biostatistics	Laure Elens	EN [q2] [20h+10h] [3 Credits] ⊕		x	x
❊ WSBIM2122	Omics data analysis	Laurent Gatto	EN [q1] [30h+10h] [3 Credits] ⊕		x	x

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

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

| | | | | | Year |
| | | | | | 1 | 2 |

◯ *Content:*

| ⊗ LINFO2401 | Open Source strategy for software development | | EN [q1] [30h+15h] [5 Credits] 🌐 *> French-friendly* | x | x |
| ⊗ LINFO2402 | Open Source Project | | EN [q1+q2] [0h] [5 Credits] 🌐 *> French-friendly* | x | x |

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
[FR] Teaching language (FR, EN, ES, NL, DE, ...)

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

Les étudiant·es doivent réussir au moins 15 crédits pour valider l'option. Cette option ne peut être prise simultanément avec l'option « Formation interdisciplinaire en création d'entreprise - CPME ».

| | | | | | Year |
| | | | | | 1 | 2 |

◯ *Content:*

◯ LEPL2211	Business issues introduction	Benoît Gailly	EN [q2] [30h] [3 Credits] 🌐 *> French-friendly*	x	x
◯ LEPL2212	Financial performance indicators		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 5 credit(s)

| ⊗ LEPL2210 | Ethics and ICT | Axel Gosseries Olivier Pereira | EN [q2] [30h] [3 Credits] 🌐 *> French-friendly* | x | x |
| ⊗ LLSMS2280 | Business Ethics and Compliance Management | | 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

Year
1 2

✿ Cours en Sourcing and Procurement

✿ LLSMS2036	Supply Chain Procurement	Per Joakim Agrell	EN [q1] [30h] [5 Credits] ⊕	x	x
✿ LLSMS2038	Procurement Organisation and Scope	Constantin Blome	EN [q1] [30h] [5 Credits] ⊕	x	x
✿ LLSMS2037	Sourcing Strategy	Constantin Blome	EN [q1] [30h] [5 Credits] ⊕	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.

MAJOR IN INTERDISCIPLINARY PROGRAM IN ENTREPRENEURSHIP - INEO

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

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

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

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

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

Year

						1	2

○ *Content:*

○ Required courses

					1	2
○ LINEO2001	Théorie de l'entrepreneuriat	Frank Janssen	[FR]	[q1] [30h+20h] [5 Credits] ⊕	x	
○ LINEO2002	Aspects juridiques, économiques et managériaux de la création d'entreprise	Yves De Cordt	[FR]	[q1] [30h+15h] [5 Credits] ⊕	x	
○ LINEO2003	Plan d'affaires et étapes-clefs de la création d'entreprise *Les séances du cours LINEO2003 sont réparties sur les deux blocs annuels du master. L'étudiant doit les suivre dès le bloc annuel 1, mais ne pourra inscrire le cours que dans son programme de bloc annuel 2.*	Frank Janssen	[FR]	[q2] [30h+15h] [5 Credits] ⊕		x
○ LINEO2004	Séminaire d'approfondissement en entrepreneuriat	Frank Janssen	[FR]	[q2] [30h+15h] [5 Credits] ⊕	x	

✳ Prerequisite courses
Student who have not taken management courses during their previous studies must enroll in LINEO2021.

					1	2
○ LINEO2021	Financer son projet		[FR]	[q2] [30h+15h] [5 Credits] ⊕	x	

COURS AU CHOIX EN CONNAISSANCES SOCIO-ÉCONOMIQUES

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

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

				Year 1	2
⌗ LFSA2995	Company Internship		FR [q1+q2] [30h] [10 Credits] 🌐	x	x
⌗ LINFO2399	Industrial seminar in computer science		EN [q2] [30h] [3 Credits] 🌐 *> French-friendly*	x	x
⌗ LINFO2402	Open Source Project		EN [q1+q2] [0h] [5 Credits] 🌐 *> French-friendly*	x	x
⌗ LEPL2021	Innovation classes for transition and sustainable development [C]		EN [q1] [30h+15h] [5 Credits] 🌐	x	x

OTHERS ELECTIVE COURSES

OTHERS ELECTIVE COURSES

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

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

Year 1 2

○ *Content:*

Les étudiant·es 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
⌗ LALLE2500	Professional development seminar German	Caroline Klein (coord.)	DE [q1+q2] [30h] [3 Credits] 🌐	x	x
⌗ LALLE2501	Professional development seminar-German	Caroline Klein (coord.)	DE [q1+q2] [30h] [5 Credits] 🌐	x	x
⌗ LESPA2600	Vocational Induction Seminar - Spanish (B2.2/C1)	Paula Lorente Fernandez (coord.)	ES [q1] [30h] [3 Credits] 🌐	x	x
⌗ LESPA2601	Vocational Induction Seminar - Spanish (B2.2/C1) [M]	Paula Lorente Fernandez (coord.)	ES [q1] [45h] [5 Credits] 🌐	x	x
⌗ LNEER2500	Seminar of Entry to professional life in Dutch - Intermediate level	Isabelle Demeulenaere (coord.)	NL [q1 or q2] [30h] [3 Credits] 🌐	x	x

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

⌘ Group dynamics

					Year	
⌘ LEPL2351	Become a tutor	Delphine Ducarme Thomas Pardoen Benoît Raucent	FR	[q1] [15h+30h] [3 Credits] ⊕	x	x
⌘ LEPL2352	Become a tutor	Delphine Ducarme Thomas Pardoen Benoît Raucent	FR	[q2] [15h+30h] [3 Credits] ⊕	x	x

⌘ Autres UEs hors-EPL

L'étudiant·e peut choisir maximum 8 crédits de cours hors EPL, considérés comme non-disciplinaires par la commission de programme.

Course prerequisites

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

The programme's courses and learning outcomes

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

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INFO2M - Information

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Access Requirements

Master course admission requirements are defined by the French Community of Belgium Decree of 7 November 2013 defining the hiher 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.

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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 "access 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	Special Requirements	Access	Remarks
"Licenciés"			
Masters			
		Direct access	

Access based on validation of professional experience

> It is possible, under certain conditions, to use one's personal and professional experience to enter a university course without having the required qualifications. However, validation of prior experience does not automatically apply to all courses. Find out more about Validation of priori experience.

Access based on application

Access based on application : access may be granted either directly or on the condition of completing additional courses of a maximum of 60 ECTS credits, or refused.

The first step of the admission procedure requires to submit an application online: https://uclouvain.be/en/study/inscriptions/futurs-etudiants.html

Selection criteria are summarized here (contact : epl-admission@uclouvain.be).

Admission and Enrolment Procedures for general registration

Teaching method

Active teaching strategies and non-technical skills

The teaching methods used in the Master's degree programme in civil engineering are consistent with those 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. In particular, our pedagogy prioritises projects (including a large scale project that puts student groups in a semi-professional situation).

Students will be exposed to various teaching methods: lectures, exercise sessions, problem solving sessions, case studies, industry or research internships, group work, individual work, seminars and conferences offered by the industrial sector. This variety of teaching techniques helps students to build their knowledge in an iterative and progressive manner while at the same time develop their autonomy as well as their organisation, time management and communication skills.

Use of Foreign Languages

Globalisation demands that all societies open up to foreign markets. In addition, the main language used in computer science is English. The use of English throughout the programme allows students to develop their mastery of this language, which will facilitate their integration into universities and foreign companies. Course materials as well as educational support are in English. However, students may express themselves in French during class or evaluations. Specifically, the Master's thesis or graduation project may be written and defended in English or French.

Furthermore, the programme foresees the possibility of taking language classes at the ILV and participating in study abroad programs.

Overall, the programme is taught in English with the exception of the biomedical engineering major and the majors in management and small and medium sized business creation.

Open to other disciplines

Students are encouraged to enlarge their training to include other engineering sciences and techniques, management as well as the humanities and social sciences. In fact, over the course of their careers, computer scientists must manage (team) projects and show an interest in the complex socio-economic context in which computer science takes place. They must dialogue with colleagues from different educational backgrounds who prioritise other aspects of a project. Thus it is imperative that students enlarge their field of vision beyond computer science.

Evaluation

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

Student work is evaluated according to University rules (see the rules for evaluating coursework and exams) namely written and oral exams, laboratory exams, individual or group work, public presentations of projects and theses defences. For classes taught in English, questions are in English. Students may respond in French. For classes taught in French, questions are in French. Students may ask for help translating the questions into English and respond to them in English.

Certain activities completed during the semester and supervised by a teaching team in collaboration with students do not take place outside of the class session. Thus they are not re-evaluated in a future course session.

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

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

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

- TIME network (Top Industrial Managers in Europe).

- CLUSTER network

- Magalhães network

- Circle U. network through several networks and European University Alliance

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

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

Possible trainings at the end of the programme

Doctoral programmes

The Master's degree in civil engineering and computer science may be followed by a doctoral degree programme in engineering sciences. Doctoral degrees are offered by thematic doctoral degree granting schools.

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

For example:

- Different Master's degree programmes in management (automatic admission based on written application).
- The Master [60] in Information and Communication at Louvain-la-Neuve or the Master [60] in Information and Communication at Mons

Contacts

Curriculum Management

Entity

Structure entity	SST/EPL/INFO
Denomination	(INFO)
Faculty	Louvain School of Engineering (EPL)
Sector	Sciences and Technology (SST)
Acronym	INFO
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Academic supervisor: Pierre Schaus

Jury

- Président du Jury: Claude Oestges
- Secrétaire du Jury: Cristel Pelsser

Useful Contact(s)

- Secrétariat: Vanessa Maons