INFO2M

2024 - 2025

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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 wiual2owho will des [(,can45.dpnomy and)]5retamme sels

INFO2M -

PROFESSIONAL FOCUS [30.0]

○ Mandatory
✖ Optional
△ Not offered in 2024-2025
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⊕ 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**

LINFO2132	Languages and translators	Ramin Sadre	EN [q2] [30h+30h] [6 Credits] 🌐 > *French-friendly*	x	x
LINFO2172	Databases				

					Year 1	Year 2
⚙ LINMA2472	Algorithms in data science	Jean-Charles Delvenne (coord.) Benoît Legat (compensates Vincent Blondel)	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
⚙ LINFO2381	Health Informatics	Sébastien Jodogne	EN [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.

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🟨 Activity with requisites
🌐 Open to incoming exchange students
🌐 Not open to incoming exchange students
[FR] Teaching language (FR, EN, ES, NL, DE, ...)

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

Students shall select 20 to 30 credits among

OR IN DATA SCIENCE AND APPLIED MATHEMATICS

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

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    △ ⊕ 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

○ ***Content:***

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

				1	2
○ LINMA2472	Algorithms in data science	Jean-Charles Delvenne (coord.) Benoît Legat (compensates Vincent Blondel)	EN [q1] [30h+22.5h] [5 Credits] 🌐 > *French-friendly*	x	x
○ LINMA2710	Scientific computing	Pierre-Antoine Absil Benoît Legat	EN [q2] [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
○ LINFO2364	Mining Patterns in Data	Siegfried Nijssen	EN [q2] [30h+15h] [5 Credits] 🌐 > *French-friendly*	x	*Marco Saere*

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.

O Mandatory
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🟨 Activity with requisites
🌐 Open to incoming exchange students
🌐 Not open to incoming exchange students
[FR] Teaching language (FR, EN, ES, NL, DE, ...)

Click on the course title to see detailed informations (objectives, methods, evaluation...)2

Year

🟨1 🟨2

O **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 least99982 Tm [(sys

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

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

O Mandatory
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🟨 Activity with requisites
🌐 Open to incoming exchange students
🌐 Not open to incoming exchange students
[FR] Teaching language (FR, EN, ES, NL, DE, ...)

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

Students shall select 20 to 30 credits among:

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.

  ○ Mandatory

				Year	
				1	2
✵ 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	Siegfried Nijssen	EN [q2] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x
✵ LINFO2401	Open Source strategy for software development	Lionel Dricot	EN [q1] [30h+15h] [5 Credits] ⊕ > *French-friendly*	x	x
✵ LINMA2472	Algorithms in data science	Jean-Charles Delvenne (coord.) Benoît Legat (compensates Vincent Blondel)	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
✵					

○ Mandatory

� Optional

△ Not offered in 2024-2025

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⊕ 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]

○ Mandatory

✖ Optional

△ Not offered in 2024-2025

⊘ Not offered in 2024-2025 but offered the following year

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△ ⊕ Not offered in 2024-2025 or the following year

🟨 Activity with requisites

🌐 Open to incoming exchange students

🌐 Not open to incoming exchange students

[FR]

COURS AU CHOIX EN CONNAISSANCES SOCIO-ÉCONOMIQUES

O Mandatory
⊗ Optional
△ Not offered in 2024-2025
⊘ Not offered in 2024-2025 but offered the following year
⊕

O Mandatory
⊗ Optional
△ Not offered in 2024-2025
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⊕

					Year	
					1	2
✇ 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)	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
✇ 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	
					1	2
✇ LEPL2351	Become a tutor	Jean-Charles Delvenne (coord.) Delphine Ducarme Thomas Pardoen Benoît Raucent	FR [q1] [15h+30h] [3 Credits] ⊕		x	x
✇ LEPL2352	Become a tutor	Jean-Charles Delvenne (coord.) 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.

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.