Université catholique de Louvain
Science and Technology Sector
Louvain School of Engineering (EPL)
Louvain-la-Neuve

Master's programmes at the Louvain School of Engineering

Programmes :

- Master's in Engineering (120 credits)
- Master's in Computer Science (120 credits)
- Master's in Data Science (120 credits)

www.uclouvain.be/epl

UCLouvain
Université

epl

Engineering at EPL is where action and sustainable innovation meet

AT THE HEART OF EUROPE

Welcome to Louvain School of Engineering (EPL) !

Our engineering school is located on the campus of the Université catholique de Louvain (UCLouvain), which is a comprehensive French-speaking university.

We are at the crossroads of North and South Europe, with easy access to Belgium's and Europe's main cities through our on-campus train station and nearby airports. Enjoy our bustling pedestrian campus surrounded by 750 acres of woods for a chance to relax, less than 40 min by train from Brussels, capital of Europe. Take advantage of our state-of-the-art sports facility, with a dedicated section tailored exclusively to cater to high-performance athletes. Furthermore, the campus offers a variety of theaters, cinemas, concerts, exhibitions, shopping mall, and a variety of restaurants and eateries all conveniently located on campus.

TESTIMONIALS

" *I studied at EPL, UCLouvain for two semesters as part of my Erasmus Mundus master's program. The professors here, have excellent industrial connections and the master thesis projects proposed by them, aim at solving some of the critical problems the world is facing today, from green energy transition to healthcare. The weekly meetings with the supervisors and the constant support from the PhD and post doc researchers of my research team helped me in impactful research planning and execution. The state-of-the-art facilities in the lab and access to several IT and research tools enabled me to undertake a challenging yet rewarding thesis project. UCLouvain is surely an ideal launchpad for a budding researcher in Europe.*"

Kamran
Doctoral Candidate at MSCA-ITN DIALECT project University of Bologna, Italy.

" *In my experience, EPL has really stood out when it comes to professors and students' proximity and accessibility. The professors at EPL go above and beyond to ensure that students feel comfortable approaching them with any questions or concerns. They are always accessible, whether it's through office hours, email, or even casual conversations and they are truly understanding when it comes to the challenges that international students may face. Without any doubt, as an exchange student, this environment has really helped me adapt and engage in university. It encourages collaboration, active participation, and a sense of belonging that enhances the overall educational experience.*"

Lorena
Double Degree TIME – Universidade de São Paulo, Brazil.

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OUR COMMITMENTS

Through inclusive educational programs, open access to our teaching resources, and strong networks with foreign partners and local companies, EPL strives to promote a vibrant diversity and global outreach. We recognize that a diverse blend of social, technological, and cultural perspectives is needed for a sustainable innovation.

Embrace a new global mindset and join us in crafting a better world. At EPL, we foster modern and conscientious technologies, empowering you with the knowledge to apply cutting-edge science in building a resilient future.

ACTIVE LEARNING

Discover innovation and endless possibilities at EPL. With a focus on critical research fields such as health, energy, data science, and many others ! With internationally recognized master degrees, and up-to-date learning models designed to empower you in achieving excellence. Connect with 275 companies in our science park for hands-on experience and networking opportunities. Engage with the open-source community, collaborate on real projects, and explore your entrepreneurial side. EPL is committed to preparing you for success in your selected field of study.

RESEARCH & ENTREPRENEURSHIP

Discover innovation and endless possibilities at EPL. With a focus on critical research fields such as health, energy, data science, and many others ! With internationally recognized master degrees, and up-to-date learning models designed to empower you in achieving excellence. Connect with 275 companies in our science park for hands-on experience and networking opportunities. Engage with the open-source community, collaborate on real projects, and explore your entrepreneurial side. EPL is committed to preparing you for success in your selected field of study.

1st CYCLE	2nd CYCLE	3rd CYCLE
BACHELOR	**MASTER**	**PhD**
180 credits - 3 years	120 or 60 credits 2 years or 1 year	180 credits
	ADVANCED MASTER	
	60 credits - 1 year	

BACHELORS	MASTERS	ADVANCED MASTERS
• **Engineering**	• **Master's in Engineering** - Biomedical Engineering - Chemical and Materials Engineering - Civil Engineering - Computer Science and Engineering - Data Science Engineering - Electrical Engineering - Electro-mechanical Engineering - Energy Engineering - Mathematical Engineering - Mechanical Engineering - Physical Engineering	• **Nuclear Engineering** • **Nanotechnology**
• **Computer Sciences**	• **Master's in Computer Science** - Computer Sciences - Cybersecurity	**PHD IN SCIENCES AND TECHNOLOGIES**
	• **Master's in Data Science** - Data Science: Information Technology	

ADMISSION FOR INTERNATIONAL STUDENTS AND SCHOLARSHIPS

While there is an admission exam to read for a Bachelor degree, there is no such examination for Master degrees. Yet applicants should satisfy the following requirements:

- To have successfully obtained a bachelor degree in engineering.
- To have solid bases in all four domains: Applied mathematics, Chemistry, Mathematics, Physics.
- Should English not be the applicant's mother tongue, a B2 score is highly recommended (IELTS 5.5-6; TOEFL IBT 65-78).
- Proficiency in French is an asset.
- EPL encourages excellence by awarding each year merit-based scholarships. For further information : infolhoistscholarship@uclouvain.be.

epl-admission@uclouvain.be

Cti
Commission des Titres d'Ingénieur

EUR-ACE®

EPL has been awarded the EUR-ACE® which is the European quality label for engineering degree programmes at First Cycle (Bachelor) and Second Cycle (Master) level.

Master's in Engineering

Master in Biomedical Engineering
(120 credits)

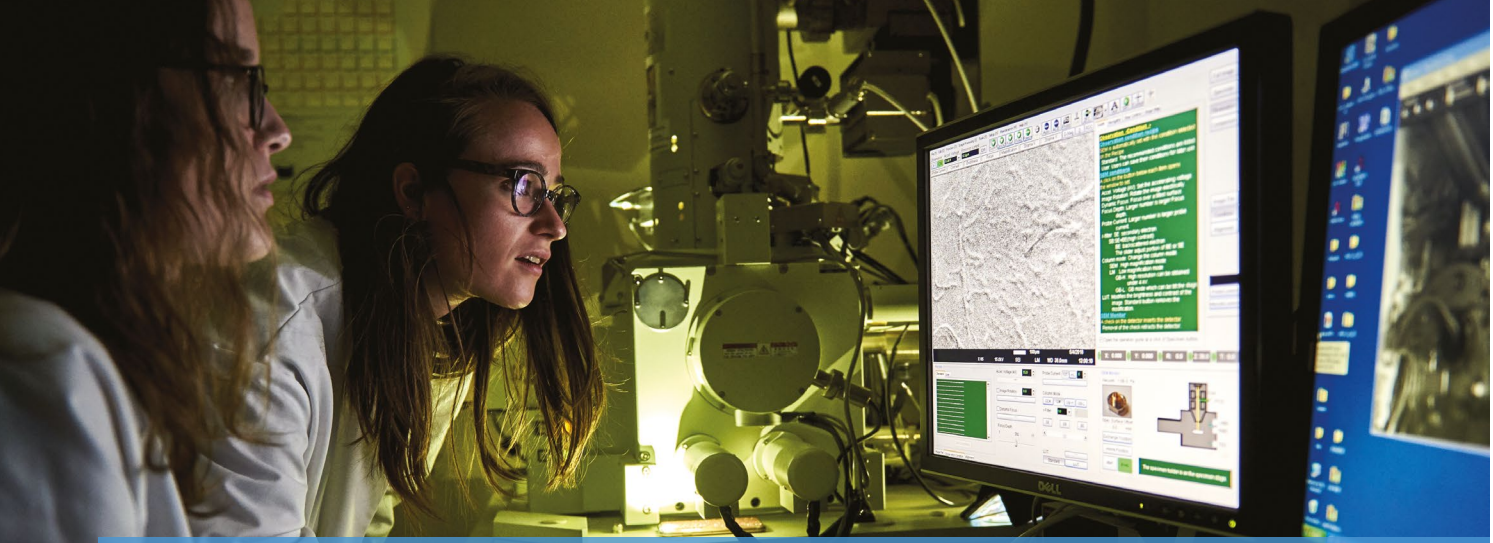
www.uclouvain.be/en-prog-gbio2m

- Campus: Louvain-la-Neuve
- Day schedule
- Duration: 2 years
- Language: English
- Activities in other language: YES
- Internship: optional

This Master's degree trains engineers to meet future challenges in the scientific and technical fields related to biomedical engineering: bioinstrumentation, biomaterials, medical imaging, artificial organs, bioinformatics, biomechanics, and medical robotics.

PROGRAMME

CORE COURSES AND PROFESSIONAL FOCUS	37 credits	■ Industrial Project in Biomedical Engineering ■ Bioinformatics ■ Bioinstrumentation ■ Biomaterials ■ Biomechanics ■ Medical Imaging ■ Modelling of Biological Systems ■ Professional Integration Work
MASTER THESIS	25 credits	
INTERNSHIP	10 credits	Students may choose to do an internship as part of their choice of options
OPTIONS OR ELECTIVE COURSES	from 48 to 58 credits	**Options** ■ Clinical Engineering ■ Acquisition and Processing of Biomedical Data ■ Biomaterials ■ Biomechanics and Medical Robotics ■ Medical Physics and Medical Imaging ■ Business Risks and Opportunities ■ Interdisciplinary Program in Entrepreneurship – INEO **Elective courses** ■ Genetic Engineering ■ Biochemical Engineering ■ Pharmaceutical Engineering ■ Statistics ■ Socio-economic Knowledge ■ Human Sciences ■ Languages



Master in Chemical and Materials Engineering
(120 credits)

www.uclouvain.be/en-prog-kima2m

- Campus: Louvain-la-Neuve
- Day schedule
- Duration: 2 years
- Language: English
- Activities in other language: YES
- Internship: optional

This master's degree offers a versatile, modular training programme that enables students to the basics of chemical and environmental engineering, the physics of advanced electronic and magnetic materials, polymer, metallic, ceramic and composite materials as well as bio- and nanotechnologies.
This programme provides training in the requirements of the chemical and materials science, by enabling the acquisition of specialised skills through a variety of options.

PROGRAMME

CORE COURSES AND PROFESSIONAL FOCUS	32 credits	■ Project Chemical & Materials Engineering for a Sustainable Future ■ Industrial Processes for the Production of Base Chemicals ■ Metallurgical and Electrochemical Processes ■ Polymer Science and Engineering ■ Science and Engineering of Metals and Ceramics ■ Professional Integration Work
MASTER THESIS	25 credits	
INTERNSHIP	10 credits	Students may choose to do an internship as part of their choice of options
OPTIONS OR ELECTIVE COURSES	60 credits	**Options** ■ Chemical Engineering ■ Materials Science and Engineering ■ Business Risks and Opportunities ■ Interdisciplinary Program in Entrepreneurship – INEO **Elective courses** ■ Materials Engineering ■ Bio and Nano Technologies ■ Sustainability and Environment ■ Chemical Engineering ■ Socio-economic Knowledge ■ Human Sciences ■ Languages

Master in Civil Engineering
(120 credits)

www.uclouvain.be/en-prog-gce2m

- Campus: Louvain-la-Neuve
- Day schedule
- Duration: 2 years
- Language: English
- Activities in other language: YES
- Internship: YES

This Masters offers advanced training in at least three major areas of the construction sector: structures and works, geomechanics and hydraulics.

This training will enable graduates to model, design, rehabilitate and construct structures in a sustainable manner, both in the built environment and in the natural environment. The courses are very advanced in terms of theory, but there is also plenty of scope for practical work. A number of practical projects punctuate the Master's programme and allow students to develop both technical and human skills. The course includes a compulsory 9-week internship in Belgium or abroad, as well as numerous site visits and an end-of-course trip. All this helps students to make the link between the subjects taught and the realities of the workplace. The Master's programme culminates in a scientific dissertation, either theoretical or experimental.

PROGRAMME

CORE COURSES AND PROFESSIONAL FOCUS	46 credits	■ Steel and Composite Steel-concrete-Structures ■ Applied Hydraulics: Open channel Flows ■ Geotechnics ■ Project 1 : Building ■ Project 2 : Civil Engineering Structures ■ Numerical Analysis of Civil Engineering Structures ■ Building Technology ■ Roads and Bridges ■ Hydraulic Structures ■ Professional Integration Work
MASTER THESIS	25 credits	
INTERNSHIP	10 credits	9-week internship
OPTIONS OR ELECTIVE COURSES	39 credits	**Options** ■ Geomechanics ■ Structures ■ Hydraulics ■ Architecture ■ Business Risks and Opportunities ■ Interdisciplinary Program in Entrepreneurship – INEO **Elective courses** ■ Socio-economic Knowledge ■ Human Sciences ■ Languages

Master in Computer Science Engineering
(120 credits)

www.uclouvain.be/en-prog-info2m

- Campus: Louvain-la-Neuve
- Day schedule
- Duration: 2 years
- Language: English
- Activities in other language: YES
- Internship: optional

This programme trains engineers capable of both designing complex IT systems for all areas of activity (industrial or otherwise) and managing their implementation.
Aspects covered range from basic computing to practical applications, focusing on computer engineering.

PROGRAMME

CORE COURSES AND PROFESSIONAL FOCUS	40 credits	■ Electronic Digital Systems ■ Languages and Translators ■ Databases ■ Architecture and Performance of Computer Systems ■ Software Development Project ■ Machine Learning: Classification and Evaluation ■ Computer Science Seminars ■ Professional Integration Work
MASTER THESIS	25 credits	
INTERNSHIP	10 credits	Students may choose to do an internship as part of their choice of options
OPTIONS OR ELECTIVE COURSES	55 credits	**Options** ■ Artificial Intelligence: Massive Data, Optimisation and Algorithms ■ Software Engineering and Programming Systems ■ Security and Computer Networks ■ Data Sciences and Applied Mathematics ■ Cryptography and Information Security ■ Biomedical engineering ■ Networks and systems ■ Health Informatics ■ Business Risks and Opportunities ■ Interdisciplinary Program in Entrepreneurship – INEO **Elective courses** ■ Socio-economic Knowledge ■ Human Sciences ■ Languages

Master in Data Science Engineering
(120 credits)

www.uclouvain.be/en-prog-date2m

- Campus: Louvain-la-Neuve
- Day schedule
- Duration: 2 years
- Language: English
- Activities in other language: NO
- Internship: optional

This programme offers training in scientific methods and technological tools to answer societal and scientific questions based on the processing of often massive data ('Big Data').
This discipline usually involves combining structured modelling of the problem of interest with computer science, statistics, and mathematics to provide a rigorous, quantitative and operational solution to the question posed.
An IT infrastructure and complex calculation algorithms also complement these scientific methods to enable the data to be structured and processed.
Finally, cybersecurity has become an essential element in a data-centric world: it involves understanding and being able to manage the risks associated with the data itself, as well as being able to protect stored data and circulate it securely.
The areas of application of data science are extremely varied: political and security decision-making, e-commerce, processing of network data, financial or industrial production data, natural language processing, biomedical research based on microbiological or imaging data, and many others.

PROGRAMME

CORE COURSES — 21 credits

- Databases
- Linear Models
- Machine Learning: Classification and Evaluation
- Elective Courses:
  - Industrial Seminar in Computer Science
  - Artificial Intelligence and Machine Learning Seminar
  - Applied Mathematics Seminar
  - Applied Statistics Workshops
- Professional Integration Work

MASTER THESIS — 25 credits

INTERNSHIP — 10 credits

Students may choose to do an internship as part of their choice of options

PROFESSIONAL FOCUS — 30 credits

Data Analytics
- Information Visualisation
- Algorithms in Data Science
- Mining Patterns in Data
- Introduction to Bayesian Statistics
- Data Mining and Decision Making
- Machine Learning : Regression, Deep Networks and Dimensionality Reduction

Cybersecurity
- Secure Electronic Circuits and Systems
- Privacy Enhancing Technology
- Computer System Security
- Secured Systems Engineering
- Cryptography
- Information Theory and Coding

OPTIONS OR ELECTIVE COURSES — 44 credits

Options
- Computer Systems
- Numerical Methods and Optimisation
- Business Risks and Opportunities
- Interdisciplinary Program in Entrepreneurship – INEO

Elective courses
- Socio-economic Knowledge
- Human Sciences
- Languages

Master in Electrical Engineering
(120 credits)

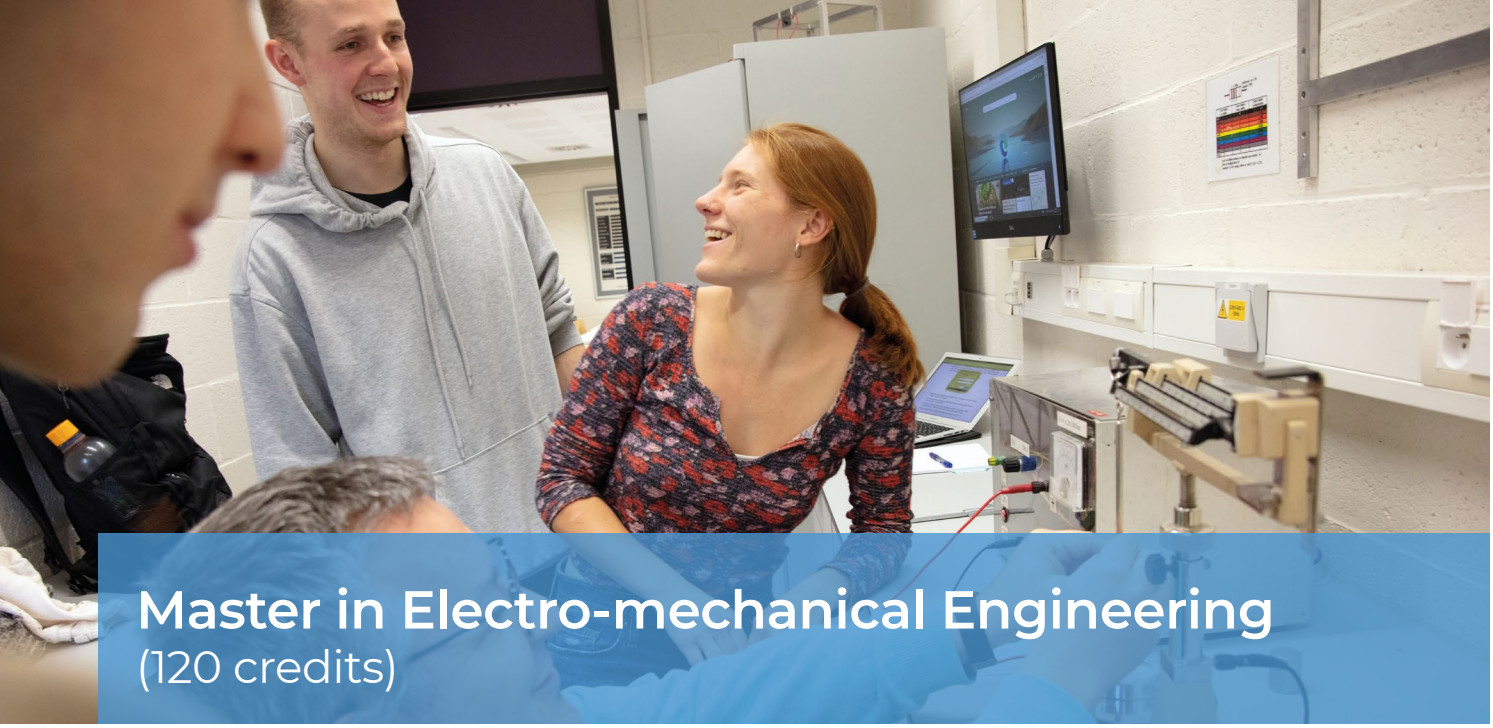
www.uclouvain.be/en-prog-elec2m

- Campus: Louvain-la-Neuve
- Day schedule
- Duration: 2 years
- Language: English
- Activities in other language: YES
- Internship: optional

This programme offers advanced training, from components to systems, in hardware, mathematics and software, from R&D to applications, in electronics, telecommunications, signal and data processing and/or electrical engineering.
The course is decidedly multidisciplinary, allowing students to choose broad or specialised training in electronic systems or devices, micro- and nanotechnologies, radio or wired transmission, communication networks, signal and data processing, security, hyperfrequencies, microwave frequencies or electrical energy.

PROGRAMME

CORE COURSES AND PROFESSIONAL FOCUS	37 credits	■ Projects in Electrical Engineering ■ Electronic Digital Systems ■ Communication Systems ■ Signal Processing ■ Elective Courses ■ Professional Integration Work
MASTER THESIS	25 credits	
INTERNSHIP	10 credits	Students may choose to do an internship as part of their choice of options
OPTIONS OR ELECTIVE COURSES	58 credits	**Options** ■ Electrical Engineering and Electrical Energy ■ Telecommunications Systems ■ Information and Signal Processing ■ Electronic Circuits and Systems ■ Advanced Electronic Materials and Devices ■ Cryptography and Information Security ■ Business Risks and Opportunities ■ Interdisciplinary Program in Entrepreneurship – INEO **Elective courses** ■ Socio-economic Knowledge ■ Human Sciences ■ Languages



Master in Electro-mechanical Engineering
(120 credits)

www.uclouvain.be/en-prog-elme2m

- Campus: Louvain-la-Neuve
- Day schedule
- Duration: 2 years
- Language: English
- Activities in other language: YES
- Internship: optional

This programme integrates the disciplines of electrical engineering and mechanical engineering in a well-balanced way. To facilitate the deepening or reorientation of knowledge during a career, it gives priority to basic knowledge.

PROGRAMME

CORE COURSES AND PROFESSIONAL FOCUS (MECHATRONICS)	62 credits	■ Dynamic Modelling and Control of ■ Electromechanical Converters ■ Power Electronics ■ Instrumentation and Sensors ■ Linear control ■ Project in Mechatronics ■ Professional Integration Work
MASTER THESIS	25 credits	
INTERNSHIP	10 credits	Students may choose to do an internship as part of their choice of options
OPTIONS OR ELECTIVE COURSES	33 credits	**Options** ■ Electronic Circuits and Systems ■ Systems and Control Engineering ■ Dynamics, Robotics and Biomechanics ■ Design, Manufacture, and Mechanics of Materials ■ Business Risks and Opportunities ■ Interdisciplinary Program in Entrepreneurship – INEO **Elective courses** ■ Socio-economic Knowledge ■ Human Sciences ■ Languages

Master in Energy Engineering
(120 credits)

www.uclouvain.be/en-prog-nrgy2m

- Campus: Louvain-la-Neuve
- Day schedule
- Duration: 2 years
- Language: English
- Activities in other language: YES
- Internship: optional

Engineers are key players in energy-related issues. More than ever, this role is set to grow - but also change radically - in the context of the huge challenge of energy transition.
The master's degree in Energy Engineering aims to develop the knowledge and skills necessary to respond appropriately to the energy challenges facing society, in particular for developing, optimising and implementing technologies related to the production or conversion of energy, the use of the various energy vectors, transport, storage and the rational use of energy.
In a resolutely multidisciplinary approach, the course incorporates relevant scientific and technological developments from research in a variety of fields such as electricity, mechanics, thermodynamics, chemistry, and energy.
The programme also aims to develop skills enabling graduates to assess the relevance and economic, environmental, and societal impacts of different energy projects and solutions, and to collaborate with experts from different disciplines.

PROGRAMME

CORE COURSES AND PROFESSIONAL FOCUS	57 credits	■ Linear Control ■ Instrumentation and Sensors ■ Power Electronics ■ Project in Energy ■ Dynamic Modelling and Control of Electromechanical Converters ■ Thermal Cycles ■ Energy Systems Lab. ■ Energetics ■ Heat and Mass Transfer ■ Electrical Power Systems ■ Renewable Energy Sources ■ Professional Integration Work
MASTER THESIS	25 credits	
INTERNSHIP		Students may choose to do an internship as part of their choice of options
OPTIONS OR ELECTIVE COURSES	38 credits	**Options** ■ Systems and Control engineering ■ Aeronautics ■ Nuclear engineering ■ Business Risks and Opportunities ■ Interdisciplinary Program in Entrepreneurship – INEO **Elective courses** ■ Socio-economic Knowledge ■ Human Sciences ■ Languages

Master in Mathematical Engineering
(120 credits)

www.uclouvain.be/en-prog-map2m

- Campus: Louvain-la-Neuve
- Day schedule
- Duration: 2 years
- Language: English
- Activities in other language: YES
- Internship: optional

This programme prepares applied mathematics engineers to design and implement mathematical models and scientific computing techniques to simulate, analyse, predict, control, and optimise the performance of complex industrial and organisational systems. It provides a solid theoretical foundation and a mastery of methodological tools so that they can be applied, often in an interdisciplinary way, in all branches of engineering, as well as in economics, environmental sciences or life sciences.

PROGRAMME

CORE COURSES AND PROFESSIONAL FOCUS	32 credits	■ Numerical Analysis: Approximation, Interpolation, Integration ■ Modelling and Analysis of Dynamical Systems ■ Matrix Computations ■ Stochastic Modelling ■ Optimization Models and Methods ■ Scientific Computing ■ Professional Integration Work
MASTER THESIS	25 credits	
INTERNSHIP		Students may choose to do an internship as part of their choice of options
OPTIONS OR ELECTIVE COURSES	63 credits	**Options** ■ Optimization and Operations Research Engineering ■ Systems and Control Engineering ■ Computational Engineering ■ Data Science ■ Financial Mathematics ■ Cryptography and Information Security ■ Biomedical Engineering ■ Business Risks and Opportunities ■ Interdisciplinary Program in Entrepreneurship – INEO **Elective courses** ■ Socio-economic Knowledge ■ Human Sciences ■ Languages

Master in Mechanical Engineering
(120 credits)

www.uclouvain.be/en-prog-meca2m

- Campus: Louvain-la-Neuve
- Day schedule
- Duration: 2 years
- Language: English
- Activities in other language: YES
- Internship: optional

This programme provides in-depth training in the main areas of mechanics:

- mechanics of articulated systems, which is concerned with the theory of mechanisms and robotics;
- solid mechanics, which seeks to predict and control the behaviour of mechanical parts and structures and the conditions under which they fail;
- fluid mechanics, which studies the flow of fluids around bodies or in forming processes;
- thermal and power engineering, which deals with power generation systems and heat transfer;
- mechanical production, which covers all aspects of work in the mechanical industry;
- mechanical manufacturing, which deals with technologies for forming and assembling industrial parts and the organisation of workshops;
- turbomachinery and engines.

PROGRAMME

CORE COURSES AND PROFESSIONAL FOCUS	32 credits	■ Internal combustion engines ■ Fluids mechanics II ■ Mechanics of Materials ■ Industrial automation ■ Heat and mass transfer II ■ Machine design ■ Professional Integration Work
MASTER THESIS	25 credits	
INTERNSHIP		Students may choose to do an internship as part of their choice of options
OPTIONS OR ELECTIVE COURSES	57 credits	**Options** ■ Aeronautics ■ Dynamics, Robotics and Biomechanics ■ Energy ■ Design, Manufacture and Mechanics of Materials ■ Nuclear Engineering ■ Business Risks and Opportunities ■ Interdisciplinary Program in Entrepreneurship – INEO **Elective courses** ■ Socio-economic Knowledge ■ Human Sciences ■ Languages

Master in Physical Engineering
(120 credits)

www.uclouvain.be/en-prog-fyap2m

- Campus: Louvain-la-Neuve
- Day schedule
- Duration: 2 years
- Language: English
- Activities in other language: YES
- Internship: optional

This programme offers an open, multidisciplinary education that prepares students for careers and specialisations in industry or high-tech activities with research aspects, thanks to its in-depth coverage of the various fields of physics (optics, electricity, mechanics, quantum physics, materials physics, etc.). research aspects.

PROGRAMME

CORE COURSES AND PROFESSIONAL FOCUS	37 credits	■ Physics of Electronic Devices and Transmission Lines ■ Physics of Functional Materials ■ Atomistic and Nanoscopic Simulations ■ Transport Phenomena in Solids and Nanostructures ■ Deformation and Fracture of Materials ■ Optics and Lasers ■ Polymer Science and Engineering - Physics ■ Polymer Chemistry and Physical Chemistry ■ Professional Integration Work
MASTER THESIS	25 credits	
INTERNSHIP		Students may choose to do an internship as part of their choice of options
OPTIONS OR ELECTIVE COURSES	58 credits	**Options** ■ Advanced Engineering Physics ■ Nanotechnologies ■ Advanced Electronic Materials and Devices **Elective courses** ■ Socio-economic Knowledge ■ Human Sciences ■ Languages

Master’s in Computer Science

Master in Computer Science
(120 credits)

www.uclouvain.be/en-prog-sinf2m

- Campus : Louvain-la-Neuve
- Day schedule
- Duration: 2 years
- Language: English
- Activities in other language: YES
- Internship: optional

THE MASTER'S DEGREE COMPRISES

- a compulsory part aimed at acquiring the skills needed to model and design complex applications. This completes the training that is essential for any university computer scientist;
- an elective option that allows you to acquire cutting-edge skills in an area that interests you: software engineering and programming systems, artificial intelligence and big data, networks and security, and business issues and the creation of SMEs;
- courses to choose from, allowing you to focus your training on your interests, whether in IT or in any other discipline (management, languages, work experience, etc.). As UCLouvain is a comprehensive university, there are many opportunities to broaden your horizons;
- a final year thesis, which makes up half of the final year workload. This gives you the opportunity to work in depth on a topic and, because of its scope, is a real introduction to the professional life of a computer scientist or researcher; the topic of this work is chosen in consultation between you, the programme leaders and possibly a company.

PROGRAMME

CORE COURSES AND PROFESSIONAL FOCUS	35 credits	■ Languages and Translators ■ Databases ■ Architecture and Performance of Computer Systems ■ Software Development Project ■ Machine Learning: Classification and Evaluation ■ Computer Science Seminars ■ Professional Integration Work
MASTER THESIS	25 credits	
INTERNSHIP		Students may choose to do an internship as part of their choice of options
OPTIONS OR ELECTIVE COURSES	60 credits	**Options** ■ Artificial Intelligence: Massive Data, Optimisation and Algorithms ■ Software Engineering and Programming Systems ■ Security and Computer Networks ■ Data Sciences and Applied Mathematics ■ Cryptography and Information Security ■ Biomedical engineering ■ Networks and systems ■ Health Informatics ■ Business Risks and Opportunities ■ Interdisciplinary Program in Entrepreneurship – INEO **Elective courses** ■ Socio-economic Knowledge ■ Human Sciences ■ Languages

Master in Cybersecurity
(120 credits)

www.uclouvain.be/en-prog-cyse2m

- Campus: Louvain-la-Neuve/ Brussels/Namur
- Day schedule
- Duration: 2 years
- Language: English
- Activities in other language: YES
- Internship: NO

Information security is an increasingly important concern of modern societies, and goes hand in hand with the development of information technologies in an increasingly large amount of applications. Dealing with the cybersecurity challenges requires an interdisciplinary approach, mixing mathematical tools from cryptography, secure software and hardware programming, applications to computer and embedded devices networking, but also ethics and law. The Master in Cybersecurity programme reflects this diversity with two focuses: the first one is oriented towards the design and analysis of cyber-systems, and the second towards the development of secure applications.

The Master's programme is taught in six institutions, in Brussels, Louvain-la-Neuve and Namur, and most students will be offered classes in at least four of these institutions, in English and in French. This ensures that student obtain a large perspective on the cybersecurity expertise available in higher education institutions from the Belgian French Community.

PROGRAMME

CORE COURSES	60 credits	■ Cryptography ■ Software Engineering and Projects management ■ Systems Administration ■ Computer System Security ■ Network Security ■ Big Data and Machine Learning ■ Protocols and Mathematical Cryptology ■ Management of Security ■ Legal Aspects of IT Security ■ Secure Software Design and Web Security ■ Mobile and Wireless Networks ■ Ethics and IT and IT Security ■ Internship
MASTER THESIS	25 credits	
INTERNSHIP		Students may choose to do an internship as part of their choice of options
PROFESSIONAL FOCUS	30 credits	**System Design and Analysis** ■ Mobile and Embedded Computing ■ Forensics and Reverse Engineering ■ Big Data and Computer Security ■ Enhancing Technologies **Corporate Strategies** ■ Analysis and Vulnerabilty Assessment ■ User-Centric Information Security ■ Case Studies in Security Strategies
ELECTIVE COURSES	10 credits	

Master in Data Science

Master in Data Science: Information Technology
(120 credits)

www.uclouvain.be/en-prog-dati2m

- Campus: Louvain-la-Neuve
- Day schedule
- Duration: 2 years
- Language: English
- Activities in other language: YES
- Internship: NO

This programme offers training in scientific methods and technological tools to answer societal and scientific questions based on the processing of often massive data ('Big Data').
This discipline usually involves combining structured modelling of the problem of interest with computer science, statistics, and mathematics to provide a rigorous, quantitative and operational solution to the question posed.
An IT infrastructure and complex calculation algorithms also complement these scientific methods to enable the data to be structured and processed.
Finally, cybersecurity has become an essential element in a data-centric world: it involves understanding and being able to manage the risks associated with the data itself, as well as being able to protect stored data and circulate it securely.
The areas of application of data science are extremely varied: political and security decision-making, e-commerce, processing of network data, financial or industrial production data, natural language processing, biomedical research based on microbiological or imaging data, and many others.

PROGRAMME

CORE COURSES — 21 credits

- Databases
- Linear Models
- Machine Learning: Classification and Evaluation
- Elective Courses:
  - Industrial Seminar in Computer Science
  - Artificial Intelligence and Machine Learning Seminar
  - Applied Mathematics Seminar
  - Applied Statistics Workshops
- Professional Integration Work

MASTER THESIS — 25 credits

INTERNSHIP — 10 credits

Students may choose to do an internship as part of their choice of options

PROFESSIONAL FOCUS — 30 credits

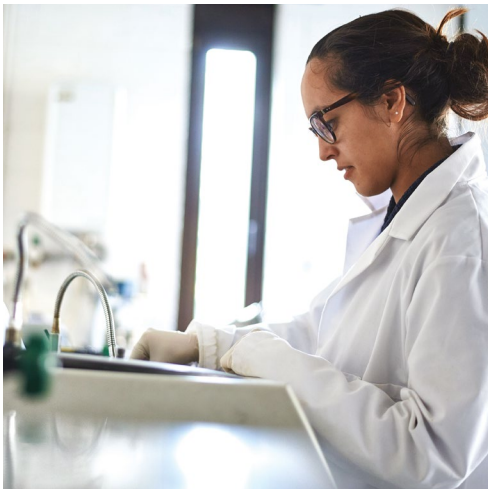
Data Analytics
- Information Visualisation
- Algorithms in Data Science
- Mining Patterns in Data
- Introduction to Bayesian Statistics
- Data Mining and Decision Making
- Machine Learning : Regression, Deep Networks and Dimensionality Reduction

Cybersecurity
- Secure Electronic Circuits and Systems
- Privacy Enhancing Technology
- Computer System Security
- Secured Systems Engineering
- Cryptography
- Information Theory and Coding

OPTIONS OR ELECTIVE COURSES — 44 credits

Data Analytics
- Computer Systems
- Numerical Methods and Optimisation
- Business Risks and Opportunities
- Interdisciplinary Program in Entrepreneurship – INEO

Elective courses
- Socio-economic Knowledge
- Human Sciences
- Languages



Advanced Masters

Advanced Master in Nanotechnology

The interuniversity Advanced Master in Nanotechnology offers holders of a basic second cycle degree complementary and/or advanced training in the fields of nanoscience and nanotechnology. It is organised around five main specialisation areas: nanophysics, nanochemistry, nanoelectronics, nanomaterials, nanobiotechnology. It is also intended to train students in the multidisciplinary aspects of nanotechnology: knowledge of basic phenomena at the nano level, nanomanufacturing or synthesis of nanostructures, characterisation of nanostructures, and modelling and numeric simulation at the nano level.

Information: **www.uclouvain.be/en-prog-nano2mc**

Advanced Master in Nuclear Engineering

The Advanced master in Nuclear Engineering is organised by the Belgian Nuclear Education Network (BNEN). This consortium gathers the 6 major Belgian universities (UCLouvain, ULg, ULB, VUB, Ugent, KU Leuven) plus the federal nuclear research center SCK·CEN.This programme provides a high academic level in the main topics of nuclear energy including nuclear physics, thermal-hydraulics, nuclear materials, fuel cycle, safety, and radioprotection, for full-time students and life-long-learning education.

Information: **www.uclouvain.be/en-prog-gnuc2mc**

Five good reasons for studying at the Louvain School of Engineering

HIGH QUALITY TEACHING AND LOW TUITION FEES

EPL has adopted a project-based approach 20 years, and it has been developing and improving its teaching methods ever since, with the support of the Louvain Learning Lab, and most recently with additional support from the ILV language institute. Furthermore, the regional government runs a subsidy system allowing EPL to apply very attractive tuition fees.

INDUSTRY ORIENTED TRAINING STRONGLY GROUNDED IN RESEARCH

EPL has developed strong links with industrial partners, some of them world leaders in their fields. This has resulted in interesting internship opportunities for students, cutting-edge applied research and excellent job opportunities upon graduation. A third of EPL students get a job proposal before graduation, approximately 95% have a paid activity within 4 months of graduation and, most importantly, 94% are happy in their work, according to a survey of alumni conducted in 2021.

INTERNATIONAL OUTLOOK AND STRONG PARTNERSHIPS ACROSS THE GLOBE

Studying at EPL also opens doors to programmes with our prestigious partners across the globe. Furthermore, master's courses are in English. This has resulted in an ever increasing offer of international exchange programmes and double-degree agreements, as well as in an ideal preparation of our students for today's global society. There are over 120 nationalities present on UCLouvain's campus without mentioning the 200.000+ learners following its on-line courses via the edX platform worldwide!

A WORLD-CLASS UNIVERSITY

Founded in 1425, UCLouvain is one of the oldest universities in Europe. Erasmus, Mercator Georges Lemaître and Christian de Duve are just some of the famous names who have studied here. The university demonstrates this excellence in an important variety of domains spanning across the humanities and social sciences, the medical sector and science and technology, as well as in the many areas where these intersect. As an example, the university runs two hospitals allowing engineering students to lead challenging and rewarding projects with concrete applications.

EXCITING AND REWARDING CAMPUS LIFE

EPL is located in Louvain-la-Neuve, the main campus of UCLouvain.
It is a safe environment, free of car traffic, and surrounded by 300 hectares (750 acres) of woods.
Yet it is close to Brussels and thus ideally connected to all of Europe, with capitals such as London, Paris or Amsterdam just a short train ride away.
The campus offers excellent sports infrastructures, and the students enjoy a rich and engaging social life.

UCLouvain
Université

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