UCLouvain

ELME2M

ELME2M - Introduction

Introduction

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ELME2M - Teaching profile

Learning outcomes

Integrating the fields of mechanics and electricity is one of the major challenges of the civil engineering student in electro-mechanics.

The Master's degree in Electro-mechanical engineering from UCLouvain favours multidisciplinary training and the ability to solve interface problems raised by the integration of several fields. It integrates the fields of electricity and mechanics into a coherent whole and prioritises basic knowledge with the aim of deepening or reorienting students' knowledge mid-career.

Students will acquire the knowledge and skills necessary to become:

- Specialists in mechatronics (electronics, mechanical production, automation and robotics) or specialists in energy (smart grids/ energy networks, thermodynamics and energy).
- Individuals with field experience capable of putting into practice their knowledge of research and technology.
- Managers who can manage team projects

The Master's degree programme in electro-mechanical engineering prepares its students to be aware of technical progress and adapt to the needs of the job market and changes in business.

Polytechnic and multidisciplinary, the training provided by the Louvain School of Engineering privileges the acquisition of knowledge that combines theory and practice and that is open to analysis, design, manufacturing, production, research and development and

				Year 1	Year 2
LELME2990	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] *> French-friendly*		x
LEPL2020	Professional integration work *The modules of LEPL2020 course are organized over*				

PROFESSIONAL FOCUS : MECATRONICS [30.0]

LELEC2531

- 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...)

Content:

Pour LINFO1361, une alternative peut être proposée pour les non-speaking French students (as Machine Learning course).

				Year 1	Year 2
LELME2311	Physics of Electromechanical Converters	Bruno Dehez	EN [q2] [30h+30h] [5 Credits] > *French-friendly*	x	x
LELEC2531	Digital electronic systems	Martin Andraud	EN [q1] [30h+30h] [5 Credits] > *French-friendly*	x	x

OPTIONS DU MASTER INGÉNIEUR CIVIL ÉLECTROMÉCANICIEN

MAJOR IN CIRCUITS AND ELECTRONIC SYSTEMS

The goal of this major (which it shares with Master's degree programs in electricity and electro-mechanics) is to introduce students to

MAJOR IN SYSTEMS AND CONTROL ENGINEERING

- Mandatory
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The student may select:
From 15 to 30credit(s)

Content:

		Year 1	Year 2
LGBIO2060	Modelling of biological systems		

Content:

				Year 1	Year 2
⊠ LGBIO2040	Biomechanics	Greet Kerckhofs	EN [q2] [30h+30h] [5 Credits] > French-friendly	x	x
⊠ LGCIV2042	Dynamics of structures	João Saraiva Esteves Pacheco De Alm	EN [q1] [30h+15h] [5 Credits] > French-friendly	x	x
⊠ LMECA2170	Numerical Geometry	Vincent Legat Jean-François Remacle	EN [q1] [30h+30h] [5 Credits] > French-friendly	x	x
⊠ LMECA2215	Vehicle System Dynamics	Paul Fisette	EN [q1] [30h+30h] [5 Credits] > French-friendly	x	x
⊠ LMECA2355	Mechanical design in biomedical engineering	Greet Kerckhofs Ann Vankrunkelsven (compensates Benoît Raucent)	EN [q1] [30h+30h] [5 Credits] > French-friendly	x	x
⊠ LELME2732	Robot modelling and control	Nicolas Docquier (compensates Renaud Ronsse)	EN [q2] [30h+30h] [5 Credits] > French-friendly	x	x
⊠ LMECA2802	Multibody system Dynamics	Paul Fisette	EN [q2] [30h+30h] [5 Credits] > French-friendly	x	x
⊠ LINMA2875	System Identification	Gianluca Bianchin	EN [q2] [30h+30h] [5 Credits] > French-friendly	x	x
⊠ LMECA2335	Biorobotics	Renaud Ronsse	EN [q2] [30h+30h] [5 Credits]	x	x

MAJOR IN AERONAUTICS

Ouverte aux étudiant·es ingénieurs civils mécaniciens et électromécaniciens, cette option reprend des cours sur l'application de la

MAJOR IN NUCLEAR ENGINEERING

As with the Master's in civil electromechanical engineering with a specialization in energy as well as the Master's in civil and mechanical engineering, the goal of this major is to offer an in-depth education in the principal aspects of nuclear engineering. Entry into this programme, which is primarily overseen by the Mol Centre of Nuclear Energy, is contingent on an evaluation of candidates' skills based on the rules used for ERASMUS-SOCRATES exchange students. Further information about this major may be found on Mol's website SCK-CEN.

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

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

Commune aux masters ingénieur civil électromécanicien, finalité spécialisée énergie, et ingénieur civil mécanicien, cette option a pour objectif d'offrir une formation approfondie dans les principaux aspects du génie nucléaire. L'accès à cette option qui est organisée pour sa plus grand partie au Centre d'énergie nucléaire de Mol est conditionnée à une évaluation des compétences des candidats suivant les règles utilisées pour les candidatures aux échanges ERASMUS-SOCRATES. Plus de détails sur cette option sont disponibles sur le site du SCK-CEN de Mol.

From 16 to 21credit(s)

Year

MAJOR IN INTERDISCIPLINARY PROGRAM IN ENTREPRENEURSHIP - INEO

COURS AU CHOIX EN CONNAISSANCES SOCIO-ÉCONOMIQUES

- Mandatory
- Optional
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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, ...)

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Year

OTHERS ELECTIVE COURSES

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- Mandatory
- Optional

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.

ELME2M - Information

Access Requirements

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

Teaching method

The majority of classes consist of lectures and tutorials. The tutors are upper-class students who have specialised tutor training (the class LEPL2351). This class provides its participants with practical tutoring techniques to help fellow students.

Methods that promote multidisciplinary studies

UCLouvain's Master's degree programme in electro-mechanics is by nature multidisciplinary because it combines classes in electricity, mechanics, automation and computer sciences. It also includes non-engineering elective classes such as economics, management and languages.

Various teaching strategies

Through a pedagogy that prioritises projects that integrate several subjects, students gain critical thinking skills, which in turn allows them to design, model, and create electro-mechanic prototypes and systems.

In the last year of the programme, half of the time is devoted to the graduation project, which offers students the possibility of working as part of a research team or collaborating with the industrial sector to study a given subject in-depth. It provides an introduction to the actual working life of an engineer or researcher (thanks to the size of the project and the context within which it is carried out).

Diverse learning situations

Various pedagogical approaches are used: lectures, projects, exercise sessions, problem solving sessions, case studies, experimental laboratories, computer simulations, educational software, internships in industry or research, factory visits, seminars and group as well as individual work. In certain subjects, eLearning allows students to learn at their own pace and carry out virtual experiments.

These diverse learning situations permit students to build their knowledge in an iterative and progressive manner all the while developing their independence, organisational and time management skills as well as their ability to communicate. Students have access to the newest information technology (materials, software, networks) during their studies.

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 reports, individual or group work, public presentations of projects and theses defences.

ELME Evaluation Methods :

Learning outcomes	Certificate-based evaluation
Demonstrate mastery of a solid body of knowledge in basic science and engineering science allowing the student to learn and solve problems pertaining to electro-mechanics (axis 1) *Organize and carry out an applied engineering process to develop a product and/or service responding to a particular need or problem in the field of electro-mechanics. (Axis 2)*	• End of the semester exam based on course exercises • Tests in some introductory classes
Organise and carryout a research project to learn about a physical phenomenon or a new problem relating to the field of electro-mechanics. (Axis 3)	• Report on mini project in field of study • Progress report on multidisciplinary project
Contribute, through teamwork, to a multidisciplinary project and carry out the project while taking into account its objectives, resources, and constraints. (Axis 4) *Communicate effectively (speaking or writing in French or a foreign language) with the goal of carrying out assigned projects. (Axis 5)* *Display rigour, openness, and critical thinking; validate the socio-technical relevance of a hypothesis or a solution, all the while drawing upon available technological and scientific innovations. (Axis 6)*	• Progress report on multidisciplinary project • Report, public presentation, and yearly work for graduation project

In certain instances, teaching is done through multidisciplinary project, the Learning by Problem Solving method (Apprentissage par problèmes or APP), flipped classes or seminars.

The certificate-based evaluation are coherent with the teachnig methods and the learning outcomes.

The formative evaluation is achieved in part during the projects via tutor feedback and above all during the graduation project.

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

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

Specialised Master's Degrees

- Advanced Master in Nanotechnologies
- Advanced Master in Nuclear Engineering
- Specialised Master's Degree in Biotechnology and Applied Biology

Doctoral Programmes

Most doctoral students study at the Institute of Information and Communication Technologies, Electronics and Applied Mathematics as well as the Institute of Mechanics, Materials and Civil Engineering. The faculty of these Institutes participate in numerous doctoral programmes. A comprehensive list is available from the President of the Third Cycle Commission.

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

For example:

- The Master [120] in Environmental Science and Management (automatic admission with possible complementary coursework)
- 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/ELME
Denomination	(ELME)
Faculty	Louvain School of Engineering (EPL)
Sector	Sciences and Technology (SST)
Acronym	ELME
Postal address	Place du Levant 3 - bte L5.03.02 1348 Louvain-la-Neuve

Academic supervisor: Emmanuel De Jaeger

Jury

- Président du Jury: Claude Oestges
- Secrétaire du Jury: Bruno Dehez

Useful Contact(s)

- Secrétariat: Isabelle Dargent