

**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 : **optional**

Main study domain : **Sciences de l'ingénieur et technologie**

Organized by: **Louvain School of Engineering (EPL)**

Programme acronym: **ELME2M** - Francophone Certification Framework: 7

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[Introduction](#)

## ELME2M - Introduction

### Introduction

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#### Introduction

The Master's degree programme in electro-mechanical engineering draws equally from two fields (mechanics and electricity) and prioritises basic knowledge with the goal of deepening or reorienting students' knowledge mid-career.

By the end of the programme, students will be able to keep up with technical developments and adapt themselves to the needs of the job market.

#### Your profile

You

- Have solid knowledge of electricity and mechanics;
- Want to improve your understanding of current technological and scientific issues;
- Want to design, model, realise and validate experimental devices and systems;
- Want to specialise in mechatronics or in energy and foresee a career in robotics and "flexible production", energy transformation and management, vehicles and transportation systems and/or aeronautics.

#### Your programme

This Master's degree offers:

- General knowledge of electro-mechanics based on research;
- The mastery of mathematical and physical methods used in electricity and mechanics;
- An interdisciplinary approach to problem solving with particular emphasis placed on interface problems;
- Pedagogy centred on project-based learning;
- The possibility of teslly f9 39ob market.



- 5.1. Identify the clients' needs: question, listen and ensure the understanding of all the dimensions of the request and not just the technical aspects.
  - 5.2. Present your arguments and convince your interlocutors (technicians, colleagues, clients, superiors) by adopting their language.
  - 5.3. Communicate through graphics and diagrams: interpret a diagram, present work results, structure information.
  - 5.4. Read and analyse different technical documents related to the profession (standards, drawings, specifications).
  - 5.5. Draft written documents that take into account contextual requirements and social conventions.
  - 5.6. Use modern communication techniques to give convincing oral presentations.
6. 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)
- 6.1. Apply standards and assure the robustness of a solution in the fields of mechanics and electricity.
  - 6.2. Put solutions into perspective by including non-technical concerns (for example, in the area of energy and climate, take environmental and social factors into consideration).
  - 6.3. Demonstrate critical thinking vis-à-vis technical solutions or methodological approach regarding the involved actors.
  - 6.4. Evaluate one's own work.

## Programme structure

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The student's programme includes:

- A common core curriculum (57 credits)
- A final specialisation (30 credits)
- One of more of the major courses or elective courses listed below.

The graduation project is normally completed in the second year. However, students may, depending on the nature of their project, choose to take their classes in the first or second year so long as their course prerequisites allow it. This is particularly the case for students completing part of their program abroad.

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

				Year	
				1	2
<p>○ LELME2990</p>	<p><b>Graduation project/End of studies project</b>  <i>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.</i></p>		<p>EN [q1+q2] [ ] [25 Credits] ⓘ                      &gt; French-friendly</p>		x
<p>○ LEPL2020</p>	<p><b>Professional integration work</b>  <i>Les modules du cours LEPL2020 sont organisés sur les deux blocs annuels du master. Il est fortement recommandé à l'étudiant.e de les suivre dès le bloc</i></p>				



**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 system design techniques, computer aided simulation, manufacturing and experimental characterisation of components and circuits (both analogue and numerical) as well as mixed systems. Emphasis is placed on practical applications and the completion of projects.

- Mandatory
- ⊗ Optional
- △ Not offered in 2023-2024
- ⊙ Not offered in 2023-2024 but offered the following year
- ⊕ Offered in 2023-2024 but not the following year
- △ ⊕ Not offered in 2023-2024 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 may select 15 to 30 credits from the following courses:

From 15 to 30 credit(s)

				Year
				1 2

**○ Compulsory course in electronic circuits and systems**

○ LELEC2532	Electronic analog systems	David Bol Denis Flandre (coord.)	EN [q2] [30h+30h] [5 Credits]  > French-friendly	x	x
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**○ Elective courses in electronic circuits and systems**

⊗ LELEC2541	Advanced Transistors	Denis Flandre Benoît Hackens Jean-Pierre Raskin	EN [q2] [30h+22.5h] [5 Credits]  > French-friendly	x	x
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**MAJOR IN SYSTEMS AND CONTROL ENGINEERING**

- Mandatory
- ⊗ Optional
- △ Not offered in 2023-2024
- ⊙ Not offered in 2023-2024 but offered the following year
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- △ ⊕ Not offered in 2023-2024 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 may select:  
From 15 to 30credit(s)

Year  
1 2

**Content:**

⊗ LGBIO2060	Modelling of biological systems	Philippe Lefèvre	EN [q1] [30h+30h] [5 Credits] 🌐 > French-friendly	X	X
⊗ LINMA2300	Analysis and control of distributed parameter systems		EN [q1] [30h+30h] [5 Credits] △ 🌐 > French-friendly	X	X
⊗ LINMA2361	Nonlinear dynamical systems	Estelle Massart Estelle Massart (compensates Pierre-Antoine Absil)	EN [q1] [30h+22.5h] [5 Credits] 🌐 > French-friendly	X	X
⊗ LINMA2671	Advanced control and applications	Julien Hendrickx	EN [q1] [30h+30h] [5 Credits] 🌐 > French-friendly	X	X
⊗ LINMA2875	System Identification	Gianluca Bianchin	EN [q2] [30h+30h] [5 Credits] 🌐 > French-friendly	X	X
⊗ LINMA2510	Mathematical ecology	Eric Deleersnijder Emmanuel Hanert Thierry Van Efferterre	EN [q2] [30h+22.5h] [5 Credits] ⊕ 🌐 > French-friendly	X	X

**MAJOR IN DYNAMICS, ROBOTICS AND BIOMECHANICS**

The goal of this major (which it shares with Master's degree programs in electricity and electro-mechanics) is to give students a complete education in this field. All phases of the mechanical manufacturing process are studied from the design stage to putting manufacturing techniques into place to production planning and the organisation of workshops. In addition, students will learn about important technological techniques (machine parts) as well as solid mechanics (elasticity and plasticity) in order to master the processing, behaviour and use of common materials. Finally, attention is paid to methods used in the fields of automation and robotics.

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- △ ⊕ Not offered in 2023-2024 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 class LELME 2732 may not be taken as part of this major by ELME (mechatronics) students. Students majoring in this field may select:


From 20 to 30credit(s)

Year  
1 2

**Content:**

⊗ LGBIO2040	Biomechanics	Greet Kerckhofs	EN [q2] [30h+30h] [5 Credits] 🌐 > French-friendly	X	X
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				Year	
				1	2
⊗ LGCIV2042	Dynamics of structures	João Saraiva Esteves Pacheco De Alm	[q1] [30h+15h] [5 Credits]  > French-friendly	x	x
⊗ LMECA2170	Numerical Geometry	Vincent Legat			

## MAJOR IN DESIGN, MANUFACTURING AND MECHANICS OF MATERIALS

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- Mandatory
- ✘ Optional
- △ Not offered in 2023-2024
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- ⊕ Offered in 2023-2024 but not the following year
- △ ⊕ Not offered in 2023-2024 or the following year
- Activity with requisites
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- 🚫 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...)

*If the course LMECA1451 has not been taken during the bachelor, you must add it to your programme.  
From 20 to 30credit(s)*

Year

1 2

### Content:

✘ LMAPR2483	Durability of materials	Laurent Delannay Thomas Pardoën	EN [q2] [30h+22.5h] [5 Credits] 🌐
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**MAJOR IN AERONAUTICS**

Ouverte aux étudiant-es ingénieurs civils mécaniciens et électromécaniciens, cette option reprend des cours sur l'application de la mécanique à l'aéronautique : structures aéronautiques, vibrations, aérodynamique, dynamique du vol. Cet apprentissage se fait au travers de cours approfondis de mécanique des fluides et des solides, avec une attention particulière portée aux méthodes numériques.

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- △ ⊕ Not offered in 2023-2024 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...)

From 20 to 30credit(s)

Year

1 2

**o Content:**

					Year
					1 2
⊗ LGCIV2041	Numerical analysis of civil engineering structures	Hadrien Rattez João Saraiva Esteves Pacheco De Alm	🇧🇪 [q2] [20h+15h] [4 Credits] 🌐 > French-friendly		X X
⊗ LMECA2195	Gasdynamics and reacting flows	Miltiadis Papalexandris	🇧🇪 [q2] [30h+30h] [5 Credits] 🌐 > French-friendly		X X
⊗ LMECA2300	Advanced Numerical Methods	Philippe Chatelain Christophe Craeye (coord.) Vincent Legat Jean-François Remacle	🇧🇪 [q2] [30h+30h] [5 Credits] 🌐 > French-friendly		X X
⊗ LMECA2323	Aerodynamics of external flows	Philippe Chatelain Grégoire Winckelmans	🇧🇪 [q2] [30h+30h] [5 Credits] 🌐 > French-friendly		X X
⊗ LMECA2550	Aircraft propulsion systems.	Philippe Chatelain	🇧🇪 [q1] [30h+30h] [5 Credits] 🌐 > French-friendly		X X
⊗ LMECA2520	Calculation of planar structures	Issam Doghri	🇧🇪 [q2] [30h+30h] [5 Credits] 🌐 > French-friendly		X X
⊗ LMECA2660	Numerical methods in fluid mechanics	Grégoire Winckelmans	🇧🇪 [q2] [30h+30h] [5 Credits] 🌐 > French-friendly		X X
⊗ LMECA2830	Aerospace dynamics.	Philippe Chatelain	🇧🇪 [q1] [30h+30h] [5 Credits] 🌐 > French-friendly		X X
⊗ LMECA2322	Fluid mechanics II	Philippe Chatelain Eric Deleersnijder Grégoire Winckelmans	🇧🇪 [q1] [30h+30h] [5 Credits] 🌐 > French-friendly		X X

## COURS AU CHOIX DISCIPLINAIRES

- Mandatory
- ⊗ Optional
- △ Not offered in 2023-2024
- ⊖ Not offered in 2023-2024 but offered the following year
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- △ ⊕ Not offered in 2023-2024 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

### o Content:

				Year	
⊗ LELEC1930	<a href="#">Introduction to telecommunication</a>	Jérôme Louveaux	FR [q2] [30h+15h] [4 Credits] 🌐	X	X
⊗ LELEC2753	<a href="#">Electrical power systems: advanced topics and smart grids</a>	Emmanuel De Jaeger	FR [q2] [30h+15h] [5 Credits] 🌐 > French-friendly	X	X
⊗ LELEC2920	<a href="#">Communication networks</a>	Sébastien Lugan Benoît Macq	FR [q1] [30h+15h] [5 Credits] 🌐 > French-friendly	X	X
⊗ LELEC2595	<a href="#">Electrical power systems dynamics and quality of supply</a>	Emmanuel De Jaeger	FR [q2] [30h+30h] [5 Credits] 🌐 > French-friendly	X	X
⊗ LENVI2007	<a href="#">Renewable energy sources</a>	Emmanuel De Jaeger Patrick Gerin (coord.) Hervé Jeanmart	FR [q1] [45 0 0 -1 19.1970005 19.1060009 Tm [(Benoît M		



OPTIONS ET COURS AU CHOIX EN CONNAISSANCES SOCIO-ÉCONOMIQUES

**BUSINESS RISKS AND OPPORTUNITIES**

- Mandatory
- ⊗ Optional
- △ Not offered in 2023-2024
- ⊖ Not offered in 2023-2024 but offered the following year
- ⊕ Offered in 2023-2024 but not the following year
- △ ⊕ Not offered in 2023-2024 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

o **Content:**

● LEPL2211	<a href="#">Business issues introduction</a>	Benoît Gailly	EN [q2] [30h] [3 Credits] 🌐 > French-friendly	X	X
● LEPL2212	<a href="#">Financial performance indicators</a>	Anne-Catherine Provost	EN [q2] [30h+5h] [4 Credits] 🌐 > French-friendly	X	X
● LEPL2214	<a href="#">Law, Regulation and Legal Context</a>	Vincent Cassiers Werner Derycke	FR [q1] [30h+5h] [4 Credits] 🌐	X	X

o **One course between**

From 3 to 5 credit(s)

⊗ LEPL2210	<a href="#">Ethics and ICT</a>	Maxime Lambrecht (compensates Axel Gosseries) Maxime Lambrecht (compensates Olivier Pereira)	EN [q2] [30h] [3 Credits] 🌐 > French-friendly	X	X
⊗ LLSMS2280	<a href="#">Business Ethics and Compliance Management</a>	Carlos Desmet	EN [q1] [30h] [5 Credits] 🌐	X	X

⊗ **Cours en marketing**

⊗ MGEST1108	<a href="#">Marketing</a>	Nadia Sinigaglia	EN [q2] [45h+20h] [6 Credits] 🌐		
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## **COURS AU CHOIX EN CONNAISSANCES SOCIO-ÉCONOMIQUES**

- Mandatory
  - ✘ Optional
  - △ Not offered in 2023-2024
  - ⊖ Not offered in 2023-2024 but offered the following year
  - ⊕ Offered in 2023-2024 but not the following year
  - △ ⊕ Not offered in 2023-2024 or the following year
  - Activity with requisites
  - 🌐 Open to incoming exchange students
  - 🌐 Not open to incoming exchange students
-



**OTHERS ELECTIVE COURSES**

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**OTHERS ELECTIVE COURSES**

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- Mandatory
- ✘ Optional
- △ Not offered in 2023-2024
- ⊖ Not offered in 2023-2024 but offered the following year
- ⊕ Offered in 2023-2024 but not the following year
- △ ⊕ Not offered in 2023-2024 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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Click on the course title to see detailed informations (objectives, methods, evaluation...)

## Course prerequisites

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The **table** below lists the activities (course units, or CUs) for which there are one or more prerequisites within the programme, i.e. the programme CU for which the learning outcomes must be certified and the corresponding credits awarded by the jury before registering for that CU.

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

### Prerequisites and student's annual programme

As the prerequisite is for CU registration purposes only, there are no prerequisites within a programme year. Prerequisites are defined between CUs of different years and therefore influence the order in which the student will be able to register for the programme's CUs.

In addition, when the jury validates a student's individual programme at the beginning of the year, it ensures its coherence, meaning that it may:

- require the student to combine registration in two separate CUs which it considers necessary from a pedagogical point of view.
- transform a prerequisite into a corequisite if the student is in the final year of a degree course.

For more information, please consult the [Academic Regulations and Procedures](https://uclouvain.be/fr/decouvrir/rgee.html) (<https://uclouvain.be/fr/decouvrir/rgee.html>).

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### # Prerequisites list

**MLSMM2134** "E-comportement du consommateur" has prerequisite(s) MGEST1108

- MGEST1108 - [Marketing](#)

**MLSMM2136** "Tendances en Digital Marketing" has prerequisite(s) MGEST1108

- MGEST1108 - [Marketing](#)

## The programme's courses and learning outcomes

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For each UCLouvain training programme, a [reference framework of learning outcomes](#) specifies 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

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

- [> General access requirements](#)
- [> Specific access requirements](#)
-

			degree may have an adapted master programme.
Bachelor in Engineering	For others institutions	Access based on application	See <a href="#">Personalized access</a>

## Non university Bachelors

> Find out more about [links](#) to the university

## Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks
"Licenciés"			



## Possible trainings at the end of the programme

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### 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

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### 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](https://uclouvain.be/repertoires/emmanuel.dejaeger) (<https://uclouvain.be/repertoires/emmanuel.dejaeger>)

Jury

- Président du Jury: [Claude Oestges](https://uclouvain.be/repertoires/claude.oestges) (<https://uclouvain.be/repertoires/claude.oestges>)
- Secrétaire du Jury: [Bruno Dehez](#)

