



## ELME2M - Introduction

### Introduction

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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 testing your knowledge in the job market thanks to internships in the industrial sector

Majors: Mechatronics; Energy

## ELME2M - Teaching profile

### Learning outcomes

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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 innovation all the while paying attention to ethics and sustainable development.

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

1. 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)

1. 1. Identify and use concepts, laws and appropriate reasoning from a variety of fields in mechanics and electricity to solve a given problem:

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## OPTIONS DU MASTER INGÉNIEUR CIVIL ÉLECTROMÉCANICIEN

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### MAJOR IN CIRCUITS AND ELECTRONIC SYSTEMS

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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 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, ...)

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[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

### ○ Content:










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***MAJOR IN SYSTEMS AND CONTROL ENGINEERING***

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## o Content:

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



## 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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- 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...)

From 20 to 30credit(s)

Year

1 2

### o Content:

|             |  |   |  |   |   |
|-------------|--|---|--|---|---|
| ✘ LGCIV2041 | Numerical analysis of civil engineering structures | Hadrien Rattiez<br>João Saraiva Esteves<br>Pacheco De Alm | EN [q2] [20h+15h] [4 Credits] 🌐<br>> French-friendly | x | x |
| ✘ LMECA2195 | Gasdynamics and reacting flows                     | Miltiadis Papalexandris                                   | EN   |   |   |









**MAJOR IN INTERDISCIPLINARY PROGRAM IN ENTREPRENEURSHIP -  
INEO**

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## OTHERS ELECTIVE COURSES

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- 🌐 Open to incoming exchange students
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Click on the course title to see detailed informations (objectives, methods, evaluation...)

Year

1 2

## o 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:

|             |  |  |                                |   |   |
|-------------|--|--|--------------------------------|---|---|
| ⊗ LALLE2500 | Professional development seminar German          | Caroline Klein (coord.)<br>Mélanie Mottin<br>(compensates<br>Caroline Klein) | DE [q1+q2] [30h] [3 Credits] 🌐 | X | X |
| ⊗ LALLE2501 | Professional development seminar-German          | Caroline Klein (coord.)<br>Mélanie Mottin<br>(compensates<br>Caroline Klein) | DE [q1+q2] [30h] [5 Credits] 🌐 | X | X |
| ⊗ LESPA2600 | Vocational Induction Seminar - Spanish (B2.2/C1) | Paula Lorente<br>Fernandez (coord.)  | ES [q1] [30h] [3 Credits] 🌐    | X | X |

## Course prerequisites

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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

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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

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

|                         |                         |                             |   |
|-------------------------|-------------------------|-----------------------------|---|
| Bachelor in Engineering | For others institutions | Access based on application | degree may have an adapted master programme.<br>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" |                      |        |         |

### Masters

|                        |               |
|------------------------|---------------|
| Masters in engineering | Direct access |
|------------------------|---------------|

## Holders of a non-University 2nd cycle degree

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

## 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: [www.uclouvain.be/en/study/inscriptions/futurs-etudiants.html](http://www.uclouvain.be/en/study/inscriptions/futurs-etudiants.html).

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

## Admission and Enrolment Procedures for general registration





