NRGY2M
2024 - 2025
Master [120] in Energy Engineering

⚠️ The version you're consulting is not definitive. This programme still may change. The final version will be published on 1th June.

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: NRGY2M - Francophone Certification Framework: 7

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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 testing your knowledge in the job market thanks to internships in the industrial sector.
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).
- Individuals with field experience capable of putting into practice their knowledge of research and technology.
- Managers in charge of projects involving teams.

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:
   - Electricity (in the broad sense)
   - Electrotechnics (conversion, controls, actuation)
   - Electronics (digital electronics, instrumentation, sensors)
   - Automation
   - Computer sciences (real time)
   - Mechanics (modeling, design)
   - Robotics and automation.
   1.2. Identify and use modelling and calculation tools to solve problems associated with the aforementioned fields.
   1.3. Verify problem solving results especially with regard to orders of magnitude and/or units (in which the results are expressed).

2. 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)
   2.1. Analyse a problem, take stock of features and constraints, and formulate specifications in a field where the technical and economic limits are taken into account
   2.2. Model a problem and design one or more technical solutions (drawing on the fields of mechanics, electrics, electronics, electrotechnics or information technology) and respond to problem specifications.
   2.3. Evaluate and classify solutions with regards to all the specification criteria: efficiency, feasibility, ergonomic quality and environmental security (for example: too expensive, too complex, too dangerous, too difficult to manipulate).
   2.4. Test a solution using a mock up, a prototype or a numerical model.
   2.5. Formulate recommendations to improve a technical solution.

3. Organise and carry out a research project to learn about a physical phenomenon or a new problem relating to the field of electromechanics. (Axis 3)
   3.1. Document and summarise the existing body of knowledge in the field of mechanics and electricity
   3.2. Suggest an experimental model or device by first constructing a mathematical model, then by using laboratories to create a device simulates system behaviour and tests relevant hypotheses.
   3.3. Synthesize conclusions in a report that shows the key parameters and their influence on the behaviour of the phenomenon under study (choice of forms and materials, physio-chemical environment, conditions for use).

4. Contribute, through teamwork, to a multidisciplinary project and carry out the project while taking into account its objectives, resources, and constraints. (Axis 4)
   4.1. Frame and explain the project’s objectives taking into account the issues, constraints and domain interfaces that characterise the project’s environment.
   4.2. Collaborate with peers on a multidisciplinary topic (mechanics and electricity) to create a work schedule (and resolve any resulting conflicts).
   4.3. Make team decisions to successfully complete the project whether they be about technical solutions of the division of labour.
   4.4. Make decisions as a team when there are choices to be made: whether on technical solutions or on the organization of work to bring the project to a successful conclusion.
5. Communicate effectively (speaking or writing in French or a foreign language) with the goal of carrying out assigned projects. (Axis 5)
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 analyze 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. Be rigorous, open-minded and critical: 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

The student’s programme includes:
• A common core curriculum (52 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 the minimum number of credits requested for the approval of their diploma as well as for the approval of their major (in order to include their academic distinctions in the diploma supplement).

These types of programmes will be submitted for approval by the relevant Master’s degree programme commission.

NRGY2M Programme

Detailed programme by subject

CORE COURSES

○ Mandatory
□ Optional
△ Not offered in 2024-2025
◊ Not offered in 2024-2025 but offered the following year
◆ Offers 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
♦ Teaching language (FR, EN, ES, NL, DE, …)

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

LINMA1510 Linear Control Gianluca Bianchin 1q [30h+30h] [5 Credits] □ French-friendly
<table>
<thead>
<tr>
<th>Module Code</th>
<th>Module Title</th>
<th>Lecturers</th>
<th>Credits</th>
<th>Contact Hours</th>
<th>Language(s)</th>
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<td>LELEC2811</td>
<td>Instrumentation and sensors</td>
<td>David Bol, Laurent Francis</td>
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<td>LELEC2660</td>
<td>Power electronics</td>
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<td>Q2+Q2</td>
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<tr>
<td>LELME2003</td>
<td>Project in energy</td>
<td>Emmanuel De Jaeger, Hervé Jeanmart</td>
<td>Q2+Q2</td>
<td>30h+0h</td>
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<td>LELME2313</td>
<td>Dynamic modelling and control of electromechanical converters</td>
<td>Emmanuel De Jaeger, Bruno Dehez</td>
<td>Q1+Q2</td>
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<tr>
<td>LELME2990</td>
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<td>Q1+Q2</td>
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<td>LEPL2020</td>
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*French-friendly*
**PROFESSIONAL FOCUS [30.0]**

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

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

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**OPTIONS**

**List of electives**

- Major in Systems and control engineering [en-prog-2024-nrgy2m-lnrgy230o]
- Major in aeronautics [en-prog-2024-nrgy2m-lnrgy240o]
- Major in nuclear engineering [en-prog-2024-nrgy2m-lnrgy237o]
- Cours au choix disciplinaires [en-prog-2024-nrgy2m-lnrgy238o]

**Options et cours au choix en connaissances socio-économiques**

- Business risks and opportunities [en-prog-2024-nrgy2m-lelme232o]
- Major in Interdisciplinary Program in Entrepreneurship - INEO [en-prog-2024-nrgy2m-lelme233o]
- Cours au choix en connaissances socio-économiques [en-prog-2024-nrgy2m-lelme239o]

**Others elective courses**

- Others elective courses [en-prog-2024-nrgy2m-lelme231o]

**LIST OF ELECTIVES**
## MAJOR IN SYSTEMS AND CONTROL ENGINEERING

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

The student may select:

**From 15 to 30 credit(s)**

### Content:

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<tr>
<th>Course Code</th>
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<td>LGBIO2060</td>
<td>Modelling of biological systems</td>
<td>Philippe Lefèvre</td>
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<tr>
<td>LINMA2300</td>
<td>Analysis and control of distributed parameter systems</td>
<td>Pierre-Antoine Abis Estelle Massart</td>
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<td>Mathematical ecology</td>
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## MAJOR IN AERONAUTICS

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

**From 20 to 30 credit(s)**

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<td>Numerical analysis of civil engineering structures</td>
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<td>LMECA2195</td>
<td>Gasdynamics and reacting flows</td>
<td>Miltiadis Papalexandris</td>
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<td>LMECA2300</td>
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<td>Philippe Chatelain Christophe Craeye (coord.) Vincent Legat Jean-François Remacle</td>
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<td>Aerodynamics of external flows</td>
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## MAJOR IN NUCLEAR ENGINEERING

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

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

### Year

#### Content:

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<th>Code</th>
<th>Course Title</th>
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<th>Credits</th>
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<td>LMECA2600</td>
<td>Introduction to nuclear engineering and reactor technology</td>
<td>Hamid Alt Abderrahim</td>
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### COURS AU CHOIX DISCIPLINAIRES

| Mandatory |
|Optional |

- Not offered in 2024-2025
- Not offered in 2024-2025 but offered the following year
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Click on the course title to see detailed informations (objectives, methods, evaluation...)

### Year

#### Content:

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<tr>
<th>Code</th>
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<td>Jean-Charles Delvenne</td>
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<td>Machine Learning :classification and evaluation</td>
<td>Pierre Dupont</td>
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<td>Thermodynamics of irreversible phenomena.</td>
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<td>LMAPR1492</td>
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<tr>
<td>LMAPR2471</td>
<td>Transport phenomena in solids and nanostructures</td>
<td>Jean-Christophe Charlier Luc Piraux</td>
<td>5</td>
<td>French-friendly</td>
<td>2</td>
</tr>
<tr>
<td>LMECA2220</td>
<td>Internal combustion engines</td>
<td>Francesco Contino Hervé Jeanmart</td>
<td>5</td>
<td>French-friendly</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>
## OPTIONS ET COURS AU CHOIX EN CONNAISSANCES SOCIO-ÉCONOMIQUES

### BUSINESS RISKS AND OPPORTUNITIES

- **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**
- **French-friendly**
- **Teaching language (FR, EN, ES, NL, DE, ...)**

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEPL2211</td>
<td>Business issues introduction</td>
<td>Benoît Gailly</td>
<td>30h</td>
<td>3 Credits</td>
</tr>
<tr>
<td>LEPL2212</td>
<td>Financial performance indicators</td>
<td></td>
<td>35h+5h</td>
<td>4 Credits</td>
</tr>
<tr>
<td>LEPL2214</td>
<td>Law, Regulation and Legal Context</td>
<td>Vincent Cassiers, Werner Derycke</td>
<td>30h+5h</td>
<td>4 Credits</td>
</tr>
<tr>
<td>LEPL2210</td>
<td>Ethics and ICT</td>
<td>Axel Gossieres, Olivier Pereira</td>
<td>30h</td>
<td>3 Credits</td>
</tr>
<tr>
<td>LLSMS2280</td>
<td>Business Ethics and Compliance Management</td>
<td></td>
<td>30h</td>
<td>5 Credits</td>
</tr>
<tr>
<td>MGEST1108</td>
<td>Marketing</td>
<td>Nada Sinigaglia</td>
<td>45h+20h</td>
<td>6 Credits</td>
</tr>
<tr>
<td>MLSMM2136</td>
<td>Trends in Digital Marketing</td>
<td>Ingrid Poncin</td>
<td>30h</td>
<td>5 Credits</td>
</tr>
<tr>
<td>MLSMM2134</td>
<td>e-Consumer Behavior</td>
<td>Karine Charry</td>
<td>30h</td>
<td>5 Credits</td>
</tr>
</tbody>
</table>

### One course between

**From 3 to 5 credit(s)**

- LEPL2210 Ethics and ICT
- LLSMS2280 Business Ethics and Compliance Management

### Cours en marketing

- MGEST1108 Marketing
- MLSMM2136 Trends in Digital Marketing
- MLSMM2134 e-Consumer Behavior

### Cours en Sourcing and Procurement

- LLSMS2036 Supply Chain Procurement
- LLSMS2038 Procurement Organisation and Scope
- LLSMS2037 Sourcing Strategy

**Alternative to the major in business risks and opportunities for computer science students**

*Computer science students who have already taken courses in this field while pursuing their Bachelor's degree may choose between 16-20 credits from the courses offered in the management minor for computer sciences.*
## MAJOR IN INTERDISCIPLINARY PROGRAM IN ENTREPRENEURSHIP - INEO

Commune à la plupart des masters de l'EPL, cette option a pour objet de familiariser l'étudiant-e avec les spécificités de l'entrepreneuriat et de la création d'entreprise afin de développer chez lui les aptitudes, connaissances et outils nécessaires à la création d'entreprise.

Cette option rassemble des étudiants de différentes facultés en équipes interdisciplinaires afin de créer un projet entrepreneurial. La formation interdisciplinaire en entrepreneuriat (INEO) est une option qui s'étend sur 2 ans et s'intègre dans plus de 30 Masters de 9 facultés/écoles de l'UCLouvain. Le choix de l'option INEO implique la réalisation d'un mémoire interfacultaire (en équipe) portant sur un projet de création d'entreprise. L'accès à cette option, ainsi qu'à chacun des cours, est limité aux étudiant·es sélectionnés sur dossier. 


L'étudiant·e qui choisit de valider cette option doit sélectionner au minimum 20 crédits et au maximum 25 crédits. Cette option n'est pas accessible en anglais et ne peut être prise simultanément avec l'option « Enjeux de l'entreprise ».

<table>
<thead>
<tr>
<th>Mandatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑️ Optional</td>
</tr>
<tr>
<td>☑️ Not offered in 2024-2025</td>
</tr>
<tr>
<td>☑️ Not offered in 2024-2025 but offered the following year</td>
</tr>
<tr>
<td>☑️ Offered in 2024-2025 but not the following year</td>
</tr>
<tr>
<td>☑️ Not offered in 2024-2025 or the following year</td>
</tr>
<tr>
<td>☑️ Activity with requisites</td>
</tr>
<tr>
<td>☑️ Open to incoming exchange students</td>
</tr>
<tr>
<td>☑️ Not open to incoming exchange students</td>
</tr>
<tr>
<td>☑️ Teaching language (FR, EN, ES, NL, DE, ...)</td>
</tr>
</tbody>
</table>

### Content:

#### Required courses

- **LINEO2001** Théorie de l'entrepreneuriat  
  - Frank Janssen  
  - [q1] [30h+20h] [5 Credits]  
  - [X]

- **LINEO2002** Aspects juridiques, économiques et managériaux de la création d'entreprise  
  - Yves De Cordt  
  - [q1] [30h+15h] [5 Credits]  
  - [X]

- **LINEO2003** Plan d'affaires et étapes-clés de la création d'entreprise  
  - Frank Janssen  
  - [q2] [30h+15h] [5 Credits]  
  - [X]

- **LINEO2004** Séminaire d'approfondissement en entrepreneuriat  
  - Frank Janssen  
  - [q2] [30h+15h] [5 Credits]  
  - [X]

#### Prerequisite courses

*Student who have not taken management courses during their previous studies must enroll in LINEO2021.*

- **LINEO2021** Financer son projet  
  - [q2] [30h+15h] [5 Credits]  
  - [X]
## COURS AU CHOIX EN CONNAISSANCES SOCIO-ÉCONOMIQUES

- **Mandatory**
- **Optional**
- △ Not offered in 2024-2025
- ○ Offered in 2024-2025 but not 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
- Teaching language (FR, EN, ES, NL, DE, ...)

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

### Content:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Year</th>
<th>Credit(s)</th>
<th>Language(s)</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>LFSA2995</td>
<td>Company Internship</td>
<td>1, 2</td>
<td>10</td>
<td>FR</td>
<td></td>
</tr>
<tr>
<td>LELEC2590</td>
<td>Seminars in electronics and communications</td>
<td>1, 2</td>
<td>3</td>
<td>EN</td>
<td></td>
</tr>
<tr>
<td>LMECA2711</td>
<td>Quality management and control.</td>
<td>1, 2</td>
<td>5</td>
<td>EN</td>
<td></td>
</tr>
<tr>
<td>LINMA2415</td>
<td>Quantitative Energy Economics</td>
<td>1, 2</td>
<td>5</td>
<td>EN</td>
<td></td>
</tr>
<tr>
<td>LMECA2645</td>
<td>Major technological hazards in industrial activity.</td>
<td>1, 2</td>
<td>3</td>
<td>EN</td>
<td></td>
</tr>
<tr>
<td>LLSMS2034</td>
<td>Supply Chain Planning</td>
<td>1, 2</td>
<td>5</td>
<td>EN</td>
<td></td>
</tr>
<tr>
<td>LSTAT2380</td>
<td>Statistical consulting</td>
<td>1, 2</td>
<td>5</td>
<td>EN</td>
<td></td>
</tr>
<tr>
<td>LSTAT2390</td>
<td>Applied statistics workshops</td>
<td>1, 2</td>
<td>3</td>
<td>EN</td>
<td></td>
</tr>
<tr>
<td>LEPL2021</td>
<td>Innovation classes for transition and sustainable development</td>
<td>1, 2</td>
<td>5</td>
<td>EN</td>
<td></td>
</tr>
</tbody>
</table>
OTHERS ELECTIVE COURSES

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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Coordinator(s)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>LALLE2500</td>
<td>Professional development seminar German</td>
<td>Caroline Klein (coord.)</td>
<td>[30h] 3</td>
</tr>
<tr>
<td>LALLE2501</td>
<td>Professional development seminar-German</td>
<td>Caroline Klein (coord.)</td>
<td>[30h] 5</td>
</tr>
<tr>
<td>LESPA2600</td>
<td>Vocational Induction Seminar - Spanish (B2.2/C1)</td>
<td>Paula Lorente Fernandez (coord.)</td>
<td>[30h] 3</td>
</tr>
<tr>
<td>LESPA2601</td>
<td>Vocational Induction Seminar - Spanish (B2.2/C1)</td>
<td>Paula Lorente Fernandez (coord.)</td>
<td>[45h] 5</td>
</tr>
<tr>
<td>LNEER2500</td>
<td>Seminar of Entry to professional life in Dutch - Intermediate level</td>
<td>Isabelle Demeulenaere (coord.)</td>
<td>[30h] 3</td>
</tr>
<tr>
<td>LNEER2600</td>
<td>Seminar of entry to professional life in Dutch - Upper-Intermediate level</td>
<td>Isabelle Demeulenaere (coord.), Dag Houdmont</td>
<td>[30h] 3</td>
</tr>
</tbody>
</table>

Group dynamics

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Coordinator(s)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEPL2351</td>
<td>Become a tutor</td>
<td>Delphine Ducarme Thomas Pardoen Benoît Raucent</td>
<td>[30h] 3</td>
</tr>
<tr>
<td>LEPL2352</td>
<td>Become a tutor</td>
<td>Delphine Ducarme Thomas Pardoen Benoît Raucent</td>
<td>[30h] 3</td>
</tr>
</tbody>
</table>

Autres UEs hors-EPL

L’étudiant-e peut choisir maximum 8 ects de cours hors EPL considérées comme non-disciplinaires par la commission de diplôme
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.
NRGY2M - Information

Access Requirements

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._

SUMMARY

• > General access requirements
• > Specific access requirements
• > University Bachelors
• > Non university Bachelors
• > Holders of a 2nd cycle University degree
• > Access based on validation of professional experience
• > Access based on application
• > Admission and Enrolment Procedures for general registration

Specific access requirements

This programme is taught in English with no prerequisite in French. A certificate is required for the holders of a non-Belgian degree, see selection criteria of the Access on the file.

University Bachelors

<table>
<thead>
<tr>
<th>Diploma</th>
<th>Special Requirements</th>
<th>Access</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCLouvain Bachelors</td>
<td>Bachelor in Engineering</td>
<td>Direct access</td>
<td>Students who have neither major nor minor in the field of their civil engineering Master's degree may have an adapted master programme.</td>
</tr>
<tr>
<td>Others Bachelors of the French speaking Community of Belgium</td>
<td>Bachelor in Engineering</td>
<td>Direct access</td>
<td>Students with a Bachelor’s degree in engineering sciences who have not taken the equivalent of a minor in the field of their civil engineering master degree may have an adapted master programme.</td>
</tr>
<tr>
<td>Bachelors of the Dutch speaking Community of Belgium</td>
<td>Bachelor in engineering</td>
<td>Access with additional training</td>
<td>Students who have no specialisation in the field of their civil engineering master degree may have an adapted master programme with up to 60 additional credits.</td>
</tr>
<tr>
<td>Foreign Bachelors</td>
<td>Bachelor in engineering</td>
<td>Bachelor degree of Cluster Institution</td>
<td>Direct access</td>
</tr>
</tbody>
</table>
Non university Bachelors

> Find out more about links to the university

**Holders of a 2nd cycle University degree**

<table>
<thead>
<tr>
<th>Diploma</th>
<th>Special Requirements</th>
<th>Access</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Licenciés&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Masters**

<table>
<thead>
<tr>
<th>Masters in engineering</th>
<th>Direct access</th>
</tr>
</thead>
</table>

**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 prior 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.

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

**Admission and Enrolment Procedures for general registration**
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.

**NRGY Evaluation Methods:***

<table>
<thead>
<tr>
<th>Learning outcomes</th>
<th>Certificate-based evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>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)</td>
<td>• End of the semester exam based on course exercises</td>
</tr>
<tr>
<td>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)</td>
<td>• Tests in some introductory classes</td>
</tr>
<tr>
<td>Organise and carry out a research project to learn about a physical phenomenon or a new problem relating to the field of electro-mechanics. (Axis 3)</td>
<td>• Report on mini project in field of study</td>
</tr>
<tr>
<td>Contribute, through teamwork, to a multidisciplinary project and carry out the project while taking into account its objectives, resources, and constraints. (Axis 4)</td>
<td>• Progress report on multidisciplinary project</td>
</tr>
<tr>
<td>Communicate effectively (speaking or writing in French or a foreign language) with the goal of carrying out assigned projects. (Axis 5)</td>
<td>• Progress report on multidisciplinary project</td>
</tr>
<tr>
<td>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)</td>
<td>• Report, public presentation, and yearly work for graduation project</td>
</tr>
</tbody>
</table>

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

The certificate-based evaluation are coherent with the teaching 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

Since its creation, the Louvain School of Engineering (EPL) has participated in diverse exchange programs that were put into place at the European level and beyond.
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 (ELME)
Denomination Louvain School of Engineering (EPL)
Faculty Sciences and Technology (SST)
Sector ELME
Acronym Place du Levant 3 - bte L5.03.02
Postal address 1348 Louvain-la-Neuve

Academic supervisor: Emmanuel De Jaeger
Useful Contact(s)
- Président du jury: Claude Oestges
- Secrétaire du jury: Bruno Dehez
- Secrétariat: Isabelle Dargent