UCLouvain

NRGY2M

2024 - 2025

Master [120] in Energy Engineering

NRGY2M - Introduction

Introduction

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

x [q1] [30h+30h] [5 Credits]

				Year 1	Year 2
LELEC2811	Instrumentation and sensors	David Bol Laurent Francis	EN [q1] [30h+30h] [5 Credits] > *French-friendly*	x	x
LELEC2660	Power electronics	Marc Bekemans	EN [q2] [30h+15h] [5 Credits] > *French-friendly*	x	x
LELME2003	Project in energy	Emmanuel De Jaeger Xavier Rixhon (compensates Hervé Jeanmart)	EN [q2] [30h+0h] [5 Credits] > *French-friendly*	x	x
LELME2313	Dynamic modelling and control of electromechanical converters	Emmanuel De Jaeger Bruno Dehez	EN [q1] [30h+30h] [5 Credits] > *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
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

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

Content:

				Year 1	Year 2
LELME2150	Thermal cycles	Yann Bartosiewicz	EN [q1] [30h+30h] [5 Credits] > French-friendly	x	x
LELME2240	Energy systems lab.	Hervé Jeanmart Nicolas Parmentier (compensates Francesco Contino)	EN [q2] [30h+30h] [5 Credits] > French-friendly	x	x
LELME2420	Energetics.	Véronique Dias (compensates Francesco Contino) Xavier Rixhon (compensates Hervé Jeanmart)	EN [q2] [30h+15h] [5 Credits] > French-friendly	x	x

EN [q2] [30h+30h] [5 Credits]

				Year 1	2
LMECA2195	Gasdynamics and reacting flows	Miltiadis Papalexandris	EN [q2] [30h+30h] [5 Credits] > *French-friendly*	x	x
LMECA2300	Advanced Numerical Methods	Philippe Chatelain Christophe Craeye (coord.) Vincent Legat Jean-François Remacle	EN [q2] [30h+30h] [5 Credits] > *French-friendly*	x	x
LMECA2322	Fluid mechanics II	Philippe Chatelain Eric Deleersnijder Grégoire Winckelmans	EN [q1] [30h+30h] [5 Credits] > *French-friendly*	x	x
LMECA2323	Aerodynamics of external flows	Philippe Chatelain Grégoire Winckelmans	EN [q2] [30h+30h] [5 Credits] > *French-friendly*	x	x
LMECA2520	Calculation of planar structures	Issam Doghri	EN [q2] [30h+30h] [5 Credits] > *French-friendly*	x	x
LMECA2550	Aircraft propulsion systems.	Philippe Chatelain	EN [q1] [30h+30h] [5 Credits] > *French-friendly*	x	x
LMECA2660	Numerical methods in fluid mechanics	Grégoire Winckelmans	EN [q2] [30h+30h] [5 Credits] > *French-friendly*	x	x
LMECA2830	Aerospace dynamics.	Philippe Chatelain	EN [q1] [30h+30h] [5 Credits] > *French-friendly*	x	x

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

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

Year
1 2

Content:

LMECA2600	Introduction to nuclear engineering and reactor technology	Hamid Aït Abderrahim	EN [q1] [30h+30h] [5 Credits] *> French-friendly*

MAJOR IN INTERDISCIPLINARY PROGRAM IN ENTREPRENEURSHIP - INEO

Commune à la plupart des masters de l'EPL, cette option a pour objectif de familiariser l'étudiant·e avec les spécificités de l'entreprenariat 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. Toutes les informations sur https://uclouvain.be/fr/etudier/ineo.

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 ».

- 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...)

Year
1 2

Content:

COURS AU CHOIX EN CONNAISSANCES SOCIO-ÉCONOMIQUES

- 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...)

Year

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.

Bachelor in Engineering	For others institutions	Access based on application	See Personalized access

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

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

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 :

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*	