UCLouvain

MECA2M

2024 - 2025

Master [120] in Mechanical Engineering

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 :

MECA2M - Introduction

Introduction

Introduction

This program trains students various fields of mechanical engineering: fluid mechanics, analytical and computational applied mechanics,

MECA2M - Teaching profile

Learning outcomes

This diploma in civil engineering in mechanics aims to meet the challenges of designing and innovating, according to a polytechnical approach, complex solutions and systems linked to mechanics and its applications. This Master's degree aims to train experts in the area of mechanics and its applications and to do so in the context of the rapidly changing circumstances of Europe and the world.

The future civil engineer in mechanics will acquire the skills and knowledge to becomeA professional polytechnic engineer capable of integrating several disciplines in the areas of continuum mechanics, thermodynamics and machine design.

An individual capable of putting into practice his/her skills as well as the tools used in research and technology.

A specialist in extremely varied and specialized applied fields such as energetics, aerodynamics, automobiles, rail transport, robotics, numerical simulation, and scientific information.

A manager who can manage projects alone or in a team.

Polytechnic and multidisciplinary, the education offered by the Louvain School of Engineering privileges the acquisition of skills and knowledge that combine theory and practice and that deal with analysis, design, manufacturing, production, research and development

5.6 Give convincing oral presentations using appropriate communication techniques.

Display rigour, openness, and critical thinking. Be able to adopt the appropriate global point of view to validate the socio-technical relevance of a hypothesis or a solution, all the while drawing upon available technological and scientific innovations.

6.1 Apply standards and assure the robustness of a solution in the fields of mechanics and electricity.

				Year 1	2
LMECA2840	Project in Mechanical Design II	Bruno Dehez Christophe Everarts (compensates Benoît Raucent) Renaud Ronsse	EN [q1+q2] [30h+30h] [6 Credits] > *French-friendly*	x	
LEPL2020	Professional integration work *The modules of LEPL2020 course are organized over the two annual blocks of the master's degree. It is strongly recommended that students take them from year 1, but they will only be able to register for the course at the earliest the year in which they present their final graduation project.* *Students who have other professional integration activities in their personal programme, or who can demonstrate an equivalent activity could be exempted from this course. This equivalence is at the discretion of the examination board. Another activity should then be chosen to reach the number of ECTS required for their graduation.*		EN [q1+q2] [30h+15h] [2 Credits] △ > *French-friendly*	x	x

PROFESSIONAL FOCUS [30.0]

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- 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:

LMECA2220	Internal combustion engines	Hervé Jeanmart Maxime Pochet (compensates Francesco Contino)	EN [q2] [30h+30h] [5 Credits] *> French-friendly*

MAJORS FOR THE MASTER'S DEGREE IN MECHANICAL ENGINEERING

MAJOR IN AERONAUTICS

Open to all students of civil and mechanical engineering and electromechanical engineering, classes in this major review mechanical applications of aeronautics: aeronautic structures, vibrations, aerodynamics, dynamics of flight, etc. The learning process consists of advanced classes in the mechanics of fluids and solids, with particular attention paid to numerical methods. This major is complemented by majors in Energy, Dynamics, Robotics and Biomechanics as well as Design, Manufacturing and Materials Mechanics (regarding

MAJOR IN DYNAMICS, ROBOTIC AND BIOMECHANICS

Open to all students of civil and mechanical engineering and electromechanical engineering, classes in this major review dynamics, robotics as well as biomechanics. Whether it be an analysis of vibrations, adjustment of a robot or the design and production of components or micro-components in bioengineering (for example, artificial Implants, valves and prosthetics), this major allows students to address one or more applications from a mechanics perspective. This major is complemented by the majors in Aeronautics, Energy as well as Design, Manufacturing and Materials Mechanics especially for students interested in problems related to dynamics and robotics in aeronautics and energy. The design and the choice of materials is crucial whether it be for the adjustment of a robot or the selection of bio-materials in rehabilitation projects.

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From 20 to 30credit(s)

Content:

LGBIO2040	Biomechanics	
LGCIV2042	Dynamics of structures	Joã F
LMECA2170	Numerical Geometry	Jear
LMECA2215	Vehicle System Dynamics	

MAJOR IN ENERGY

Classes in this major review the subject of energy in the real world. This subject is addressed in its entirety first by the study of production techniques and energy conversion (thermal machines, nuclear energy, renewable energy) followed by an analysis of the risks associated with energy production and the means of minimising these risks (major risks, pollution) and finally a study of energy consumption and its consequences. This major is complemented by the major in Aeronautics for those students interested in problems of energy and motorisation in aeronautics. This is also the case for the major in Dynamics, Robotics and Biomechanics as well as the

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 conditional 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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Content:

				Year 1	Year 2
Compulsory courses for the nuclear engineering major (10 credits)					
LMECA2600	Introduction to nuclear engineering and reactor technology	Hamid Aït Abderrahim	EN [q1] [30h+30h] [5 Credits] *> French-friendly*	x	
LMECA2648	Nuclear thermal-hydraulics (Centre d'étude nucléaire-Mol)	Yann Bartosiewicz	EN [q1] [40h+7.5h] [5 Credits] *> French-friendly*		x
Elective courses for the nuclear engineering major					
LBNEN2002	Introduction to Nuclear Physics & Measurements (Centre d'étude nucléaire-Mol)		EN [q1] [] [3 Credits]		x
LBNEN2003	Safety of Nuclear Powerplants (Centre d'étude nucléaire-Mol)		EN [q2] [] [5 Credits]		x
LBNEN2011	Radiation protection (Centre d'étude nucléaire-Mol)		EN [q1] [] [3 Credits]	x	x

MAJOR IN DESIGN, MANUFACTURING AND MECHANICS OF MATERIALS

Open to civil, mechanical and electromechanical engineering students, this major reviews design, manufacturing and the importance of materials in the development of a mechanical system. It also addresses physical and chemical properties and the behaviour of

Year
1 2

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.

COURS AU CHOIX EN CONNAISSANCES SOCIO-ÉCONOMIQUES

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				Year 1	Year 2
Content:					
LFSA2995	Company Internship	Dimitri Lederer Jean-Pierre Raskin	FR [q1+q2] [30h] [10 Credits]	x	x
LMECA2711	Quality management and control.	Alexandre Debatty Laurence Guiot (coord.)	EN [q2] [30h+30h] [5 Credits] *> French-friendly*	x	x
LMECA2645	Major technological hazards in industrial activity.	Aude Simar	FR [q2] [30h] [3 Credits]	x	x
LEPL2021	Innovation classes for transition and sustainable development	Benoît Macq Xavier Marichal (compensates Benoît Raucent)	EN [q1] [30h+15h] [5 Credits]	x	x

OTHER ELECTIVE COURSES

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Content:

Les étudiant·e·s 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:

				Year 1	Year 2
LALLE2500	Professional development seminar German	Caroline Klein (coord.) Mélanie Mottin (compensates Caroline Klein)	DE [q1+q2] [30h] [3 Credits]	x	x
LALLE2501	Professional development seminar-German	Caroline Klein (coord.) Mélanie Mottin (compensates Caroline Klein)	DE [q1+q2] [30h] [5 Credits]	x	x

				Year 1	2
⊠ LESPA2600	Vocational Induction Seminar - Spanish (B2.2/C1)	Paula Lorente Fernandez (coord.)	ES [q1] [30h] [3 Credits]	x	x
⊠ LESPA2601	Vocational Induction Seminar - Spanish (B2.2/C1)	Paula Lorente Fernandez (coord.)	ES [q1] [45h] [5 Credits]	x	x
⊠ LNEER2500	Seminar of Entry to professional life in Dutch - Intermediate level	Isabelle Demeulenaere (coord.)	NL [q1 or q2] [30h] [3 Credits]		

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.

MECA2M - 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

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

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

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

To obtain a passing grade, the marks received for the teaching units are offset by their respective credits.

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.

Louvain School of Engineering takes part in the TFM-ASA Master Program. The TFM-ASA Master Program is a two-year Master of Science Program taught in English by 3 Universities in 3 different countries (Catholic University of Louvain (Belgium) , Brandenburg University of Technology (Germany) and University of Bordeaux (France)).
The students will benefit from top quality training in Mechanical and Aerospace Engineering. They will spend an entire semester in each university. Many industrial partners are directly involved through internships for students, conferences and even courses.

Louvain School of Engineering takes part in The Erasmus Mundus Joint Master Degree STRAINS. STRAINS is a 2-year master programme of excellence in English for students wishing to develop their knowledge and skills in the field of solid mechanics for the modeling of materials and structures.

It was built by a consortium of six acknowledged European Universities and associated partners. The disciplinary opening is given by the student mobility. The programme leads to the award of a recognized joint diploma. The master is aimed to give thorough theoretical, experimental and numerical tools for solving advanced engineering problems, especially emphasizing the dialogue between these three aspects.

The educational aim of the programme is to qualify students to a level of excellence in one of the **4 specialised fields of Mechanics**:

- Computational Mechanics
- Mechanics of Structures
- Mechanics of Materials
- Material Design & Properties

This **2-year study program of excellence, leading to 120 credit** Master's diplomas was designed to meet the renewed international demand for qualified graduates with dedicated training and experience in fundamental and advanced mechanics.

The programme offers **mobility across 5 European sites** with the objective for the student to do at least 2 or 3 mobilities within its course.

Possible trainings at the end of the programme

Further Master's degree programmes: Advanced Master in Nuclear Engineering

Further doctoral degree programmes: GRAMECH (GRAduate School in MECHanics)

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

For example:

- 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/MECA
Denomination	(MECA)
Faculty	Louvain School of Engineering (EPL)
Sector	Sciences and Technology (SST)
Acronym	MECA
Postal address	Place du Levant 2 - bte L5.04.03 1348 Louvain-la-Neuve Tel: +32 (0) 10 47 22 00

Academic supervisor: Philippe Chatelain

Jury

- Président du Jury: Claude Oestges
- Secrétaire du Jury: Vincent Legat

Useful Contact(s)

- Secrétariat: Isabelle Hennau