



UCLouvain  
Study  
programme  
2019 - 2020

## Minor in Engineering Sciences: Mechanics (only available for reenrolment)

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## Introduction

### Introduction

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## Teaching profile

### Learning outcomes

The primary objective of the "polytechnic" minors organized by the Faculté des Sciences Appliquées is to allow students taking a baccalaureate in engineering science, if they so wish, to acquire, through a polytechnic major/minor, basic training in two specialist areas of engineering science, and thus to broaden their technical range of skills, or prepare for a master's in engineering science in a domain which spans the various basic courses offered at baccalaureate level.

The disciplinary objectives of the minor in mechanics are to allow the student to acquire the basic concepts of theoretical and applied mechanics. For precisely, s/he will need to:

- Master this discipline via project and laboratory-based learning.
- Develop a deeper grasp of continuum mechanics (solids and fluid mechanics), in order to master the techniques of scale model studies and mathematical modeling required by these disciplines.
- Develop a deeper understanding of thermodynamics, both from a theoretical point of view (a deep understanding of thermodynamics, both from a theoretical point of view (understanding macroscopic concepts starting with kinetic theory of gases) as well as an applied point of view (technical and energetic thermodynamics).
- Acquire specialized training in machine design.

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

- Acquérir une formation polyvalente permettant de s'orienter sans difficultés dans les multiples technologies associées à l'activité de l'ingénieur mécanicien.
- Développer une connaissance approfondie de la mécanique des milieux continus (mécanique des solides et des fluides), pour maîtriser les techniques de modélisation physique et mathématique requises par ces disciplines.
- Développer une connaissance approfondie de la thermodynamique, tant du point de vue théorique (appréhension des concepts macroscopiques à partir de la théorie cinétique des gaz) que du point de vue appliqué (thermodynamique technique et énergétique).
- Acquérir une expertise en modélisation mathématique et en simulation numérique.
- Accroître ses compétences en conception des machines et fabrication mécanique.

## Detailed programme

### PROGRAMME BY SUBJECT

- Mandatory  
 △ Courses not taught during 2019-2020  
 ⊕ Periodic courses taught during 2019-2020
- ✖ Optional  
 ⊖ Periodic courses not taught during 2019-2020  
 ■ Activity with requisites

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

Year

2 3

#### Contenu:

#### ✖ Variante pour les étudiants inscrits en majeure ingénieur civil biomédical (30 credits)

|             |                                         |                                                                                                 |         |           |      |   |   |
|-------------|-----------------------------------------|-------------------------------------------------------------------------------------------------|---------|-----------|------|---|---|
| ● LMECA1210 | Description et analyse des mécanismes   | Francesco Contino<br>Paul Fiset<br>Thomas Servais<br>(compensates<br>Benoît Raucent)            | 30h+30h | 5 Credits | 2q   | x |   |
| ● LMECA1120 | Introduction to finite element methods. | Vincent Legat                                                                                   | 30h+30h | 5 Credits | 2q △ | x |   |
| ● LMECA1855 | Thermodynamics and energetics.          | Yann Bartosiewicz<br>Miltiadis Papalexandris                                                    | 30h+30h | 5 Credits | 1q   |   | x |
| ● LMECA1451 | Mechanical manufacturing.               | Laurent Delannay<br>Aude Simar                                                                  | 30h+30h | 5 Credits | 1q   |   | x |
| ● LMECA1100 | Deformable solid mechanics.             | Brieux Delsaute<br>(compensates<br>Issam Doghri)<br>Issam Doghri                                | 30h+30h | 5 Credits | 2q   |   | x |
| ● LMECA1321 | Fluid mechanics and transfer phenomena. | Vincent Legat<br>Vincent Legat<br>(compensates<br>Grégoire Winckelmans)<br>Grégoire Winckelmans | 30h+30h | 5 Credits | 2q   |   | x |

#### ✖ Variante pour les étudiants inscrits en majeure ingénieur civil en chimie et physique appliquées. (30 credits)

|             |                                         |                                                                                      |         |           |      |   |   |
|-------------|-----------------------------------------|--------------------------------------------------------------------------------------|---------|-----------|------|---|---|
| ● LMECA1210 | Description et analyse des mécanismes   | Francesco Contino<br>Paul Fiset<br>Thomas Servais<br>(compensates<br>Benoît Raucent) | 30h+30h | 5 Credits | 2q   | x |   |
| ● LMECA1120 | Introduction to finite element methods. | Vincent Legat                                                                        | 30h+30h | 5 Credits | 2q △ | x |   |
| ● LMECA1855 | Thermodynamics and energetics.          | Yann Bartosiewicz<br>Miltiadis Papalexandris                                         | 30h+30h | 5 Credits | 1q   |   | x |
| ● LMECA1100 | Deformable solid mechanics.             | Brieux Delsaute<br>(compensates<br>Issam Doghri)<br>Issam Doghri                     | 30h+30h | 5 Credits | 2q   |   | x |
| ● LMECA1451 | Mechanical manufacturing.               | Laurent Delannay<br>Aude Simar                                                       | 30h+30h | 5 Credits | 1q   |   | x |
| ● LINMA1510 | Linear Control                          | Denis Dochain                                                                        | 30h+30h | 5 Credits | 2q   |   | x |

#### ✖ Variante pour les étudiants inscrits en majeure ingénieur civil des constructions (30 credits)

|             |                                       |                                                                                      |         |           |    |   |   |
|-------------|---------------------------------------|--------------------------------------------------------------------------------------|---------|-----------|----|---|---|
| ● LMECA1210 | Description et analyse des mécanismes | Francesco Contino<br>Paul Fiset<br>Thomas Servais<br>(compensates<br>Benoît Raucent) | 30h+30h | 5 Credits | 2q | x |   |
| ● LMECA1855 | Thermodynamics and energetics.        | Yann Bartosiewicz<br>Miltiadis Papalexandris                                         | 30h+30h | 5 Credits | 1q |   | x |

|             |                                         |                                                                                                 |         |           |    | Year |   |
|-------------|-----------------------------------------|-------------------------------------------------------------------------------------------------|---------|-----------|----|------|---|
|             |                                         |                                                                                                 |         |           |    | 2    | 3 |
| ○ LMECA1451 | Mechanical manufacturing.               | Laurent Delannay<br>Aude Simar                                                                  | 30h+30h | 5 Credits | 1q |      | x |
| ○ LINMA1510 | Linear Control                          | Denis Dochain                                                                                   | 30h+30h | 5 Credits | 2q |      | x |
| ○ LMECA1321 | Fluid mechanics and transfer phenomena. | Vincent Legat<br>Vincent Legat<br>(compensates<br>Grégoire Winckelmans)<br>Grégoire Winckelmans | 30h+30h | 5 Credits | 2q |      | x |
| ○ LMECA1100 | Deformable solid mechanics.             | Brieux Delsaute<br>(compensates<br>Issam Doghri)<br>Issam Doghri                                | 30h+30h | 5 Credits | 2q |      | x |

### ✂ Variante pour les étudiants inscrits en majeure ingénieur civil en mathématiques appliquées (30 credits)

|             |                                         |                                                                                                 |         |           |    |   |   |
|-------------|-----------------------------------------|-------------------------------------------------------------------------------------------------|---------|-----------|----|---|---|
| ○ LMECA1210 | Description et analyse des mécanismes   | Francesco Contino<br>Paul Fisette<br>Thomas Servais<br>(compensates<br>Benoît Raucourt)         | 30h+30h | 5 Credits | 2q | x |   |
| ○ LMAT1223  | Differential equations                  | Heiner Olbermann                                                                                | 30h+15h | 5 Credits | 2q | x |   |
| ○ LMECA1855 | Thermodynamics and energetics.          | Yann Bartosiewicz<br>Miltiadis Papalexandris                                                    | 30h+30h | 5 Credits | 1q |   | x |
| ○ LMECA1451 | Mechanical manufacturing.               | Laurent Delannay<br>Aude Simar                                                                  | 30h+30h | 5 Credits | 1q |   | x |
| ○ LMECA1100 | Deformable solid mechanics.             | Brieux Delsaute<br>(compensates<br>Issam Doghri)<br>Issam Doghri                                | 30h+30h | 5 Credits | 2q |   | x |
| ○ LMECA1321 | Fluid mechanics and transfer phenomena. | Vincent Legat<br>Vincent Legat<br>(compensates<br>Grégoire Winckelmans)<br>Grégoire Winckelmans | 30h+30h | 5 Credits | 2q |   | x |

### ✂ Variante pour les étudiants inscrits en majeure ingénieur civil électricien (30 credits)

|             |                                         |                                                                                                 |         |           |      |   |   |
|-------------|-----------------------------------------|-------------------------------------------------------------------------------------------------|---------|-----------|------|---|---|
| ○ LMECA1210 | Description et analyse des mécanismes   | Francesco Contino<br>Paul Fisette<br>Thomas Servais<br>(compensates<br>Benoît Raucourt)         | 30h+30h | 5 Credits | 2q   | x |   |
| ○ LMECA1120 | Introduction to finite element methods. | Vincent Legat                                                                                   | 30h+30h | 5 Credits | 2q Δ | x |   |
| ○ LMECA1855 | Thermodynamics and energetics.          | Yann Bartosiewicz<br>Miltiadis Papalexandris                                                    | 30h+30h | 5 Credits | 1q   |   | x |
| ○ LMECA1100 | Deformable solid mechanics.             | Brieux Delsaute<br>(compensates<br>Issam Doghri)<br>Issam Doghri                                | 30h+30h | 5 Credits | 2q   |   | x |
| ○ LMECA1321 | Fluid mechanics and transfer phenomena. | Vincent Legat<br>Vincent Legat<br>(compensates<br>Grégoire Winckelmans)<br>Grégoire Winckelmans | 30h+30h | 5 Credits | 2q   |   | x |
| ○ LMECA1901 | Continuum mechanics.                    | Philippe Chatelain<br>Issam Doghri<br>Olivier Lamberts<br>(compensates<br>Issam Doghri)         | 30h+30h | 5 Credits |      |   | x |

### ✂ Variante pour les étudiants inscrits en majeure ingénieur civil en informatique (30 credits)

|             |                                       |                                                                                         |         |           |    |   |  |
|-------------|---------------------------------------|-----------------------------------------------------------------------------------------|---------|-----------|----|---|--|
| ○ LMECA1210 | Description et analyse des mécanismes | Francesco Contino<br>Paul Fisette<br>Thomas Servais<br>(compensates<br>Benoît Raucourt) | 30h+30h | 5 Credits | 2q | x |  |
|-------------|---------------------------------------|-----------------------------------------------------------------------------------------|---------|-----------|----|---|--|

|             |                                         |                                                                                                 |         |           |      |   | Year |   |
|-------------|-----------------------------------------|-------------------------------------------------------------------------------------------------|---------|-----------|------|---|------|---|
|             |                                         |                                                                                                 |         |           |      |   | 2    | 3 |
| ● LMECA1120 | Introduction to finite element methods. | Vincent Legat                                                                                   | 30h+30h | 5 Credits | 2q Δ | x |      |   |
| ● LMECA1855 | Thermodynamics and energetics.          | Yann Bartosiewicz<br>Miltiadis Papalexandris                                                    | 30h+30h | 5 Credits | 1q   |   |      | x |
| ● LMECA1100 | Deformable solid mechanics.             | Brieux Delsaute<br>(compensates<br>Issam Doghri)<br>Issam Doghri                                | 30h+30h | 5 Credits | 2q   |   |      | x |
| ● LMECA1321 | Fluid mechanics and transfer phenomena. | Vincent Legat<br>Vincent Legat<br>(compensates<br>Grégoire Winckelmans)<br>Grégoire Winckelmans | 30h+30h | 5 Credits | 2q   |   |      | x |
| ● LMECA1901 | Continuum mechanics.                    | Philippe Chatelain<br>Issam Doghri<br>Olivier Lamberts<br>(compensates<br>Issam Doghri)         | 30h+30h | 5 Credits |      |   |      | x |

### ⌘ Variante pour les étudiants inscrits dans un autre programme que FSA1BA (30 credits)

|             |                                         |                                                                                                 |         |           |      |   |  |   |
|-------------|-----------------------------------------|-------------------------------------------------------------------------------------------------|---------|-----------|------|---|--|---|
| ● LMECA1210 | Description et analyse des mécanismes   | Francesco Contino<br>Paul Fiset<br>Thomas Servais<br>(compensates<br>Benoît Raucourt)           | 30h+30h | 5 Credits | 2q   | x |  |   |
| ● LMECA1120 | Introduction to finite element methods. | Vincent Legat                                                                                   | 30h+30h | 5 Credits | 2q Δ | x |  |   |
| ● LMECA1855 | Thermodynamics and energetics.          | Yann Bartosiewicz<br>Miltiadis Papalexandris                                                    | 30h+30h | 5 Credits | 1q   |   |  | x |
| ● LMECA1100 | Deformable solid mechanics.             | Brieux Delsaute<br>(compensates<br>Issam Doghri)<br>Issam Doghri                                | 30h+30h | 5 Credits | 2q   |   |  | x |
| ● LMECA1321 | Fluid mechanics and transfer phenomena. | Vincent Legat<br>Vincent Legat<br>(compensates<br>Grégoire Winckelmans)<br>Grégoire Winckelmans | 30h+30h | 5 Credits | 2q   |   |  | x |
| ● LMECA1901 | Continuum mechanics.                    | Philippe Chatelain<br>Issam Doghri<br>Olivier Lamberts<br>(compensates<br>Issam Doghri)         | 30h+30h | 5 Credits |      |   |  | x |

## COURSE PREREQUISITES

A document entitled (nb: not available for this programme lmea100i) specifies the activities (course units - CU) with one or more pre-requisite(s) within the study programme, that is the CU whose learning outcomes must have been certified and for which the credits must have been granted by the jury before the student is authorised to sign up for that activity.

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

As the prerequisites are a requirement of enrolment, there are none within a year of a course.

The prerequisites are defined for the CUs for different years and therefore influence the order in which the student can enrol in the programme's CUs.

In addition, when the panel validates a student's individual programme at the beginning of the year, it ensures the consistency of the individual programme:

- It can change a prerequisite into a corequisite within a single year (to allow studies to be continued with an adequate annual load);
- It can require the student to combine enrolment in two separate CUs it considers necessary for educational purposes.

For more information, please consult regulation of studies and exams (<https://uclouvain.be/fr/decouvrir/rgee.html>).

## **THE PROGRAMME'S COURSES AND LEARNING OUTCOMES**

For each UCLouvain training programme, a [reference framework of learning outcomes](#) specifies the competences expected of every graduate on completion of the programme. You can see the contribution of each teaching unit to the programme's reference framework of learning outcomes in the document *"In which teaching units are the competences and learning outcomes in the programme's reference framework developed and mastered by the student?"*

## Information

### Liste des bacheliers proposant cette mineure

> [Bachelor in Engineering](#) [en-prog-2019-fsa1ba]

## Admission

### Specific Admission Requirements

This polytechnic minor is mainly intended for students enrolled on baccalaureates in engineering science (civil engineer and civil engineer architect).

The minor is also accessible to students enrolled on baccalaureates in mathematical or physical science.

Minor activities must be followed in an order which respects the following requirements:

- MECA1901 must come before MECA1321 and MECA1100
- When students must enroll on the course MECA1510 as a replacement for a course that they are following in their major, as is required by some programs, they must also take it after MECA1901. This rule also applies to non-FSA students who find themselves in the same situation.

## Evaluation

*The evaluation methods comply with the **regulations concerning studies and exams** (<https://uclouvain.be/fr/decouvrir/rgee.html>). More detailed explanation of the modalities specific to each learning unit are available on their description sheets under the heading "Learning outcomes evaluation method".*

### Possible trainings at the end of the programme

Majors-minors leading directly to a master's course(s) :

For students who have performed well and obtained a bachelor's qualification in engineering science - civil engineering, the polytechnic minors guarantee them, as part of a program which includes one of these minors, unconditional access, without additional training, to the civil engineering master's which corresponds to this minor.

- For the minor in applied chemistry and physics: the civil engineering master's in chemistry and material science and the civil engineering master's physicist
- For the minor in construction : the civil engineering master's in construction
- For the minor in electricity: the civil engineering master's electrician
- For the minor in IT: the civil engineering master's in IT
- For the minor in mechanics: the civil engineering master's mechanic
- For the minor in applied mathematics: the civil engineering master's in applied mathematics
- For a program which combines the major in electricity/minor in mechanics, or major in mechanics/minor in electricity: the civil engineering master's electromechanic.

## Contacts

**Attention, you are currently reading an archived page: below contact informations were for program study 2019-2020 only. To get current contact informations please go to [current program study](#) site.**

### Curriculum Management

|                                    |                                                                                                                                                 |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Entity                             |                                                                                                                                                 |
| Structure entity                   | SST/EPL/MECA                                                                                                                                    |
| Denomination                       | (MECA) ( <a href="https://uclouvain.be/repertoires/entites/meca">https://uclouvain.be/repertoires/entites/meca</a> )                            |
| Faculty                            | Louvain School of Engineering (EPL) ( <a href="https://uclouvain.be/repertoires/entites/epl">https://uclouvain.be/repertoires/entites/epl</a> ) |
| Sector                             | Sciences and Technology (SST) ( <a href="https://uclouvain.be/repertoires/entites/sst">https://uclouvain.be/repertoires/entites/sst</a> )       |
| Acronym                            | MECA                                                                                                                                            |
| Postal address                     | Place du Levant 2 - bte L5.04.03<br>1348 Louvain-la-Neuve<br>Tel: <a href="tel:+322472200">+32 (0) 10 47 22 00</a>                              |
| Academic supervisor: Vincent Legat |                                                                                                                                                 |
| Useful Contact(s)                  | • Isabelle Hennau                                                                                                                               |

**Attention, you are currently reading an archived page: below contact informations were for program study 2019-2020 only. To get current contact informations please got to [current program study](#) site.**

