**Cycle view of the study programme**

Depending on your educational background or depending on the focus, it is possible that the prerequisites / corequisites for the 1st year of the programme are presented in the block 2. You are therefore invited to read through the list of courses in block 2 even if you are registering for the first time in this master.

As part of the Master in electro-mechanical engineering, students must follow or approve 65 core training credits (including placement and final dissertation), 25 credits of optional courses and 30 credits from one of the two professional focuses. Ideally, students taking the Masters will have acquired the skills and knowledge corresponding to 50 credits for the specific technical classes in the field of "mechanics" and "electricity" organised as part of the Bachelor in civil engineering.

### Compulsory courses (B1 : 30Cr, B2 : 35Cr)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECA0522-1</td>
<td>Heat exchangers, constructive and fundamental aspects - Philippe NGENDAKUMANA - [16h Proj.]</td>
<td>B1 Q1</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Corequisite: MECA0002-1 - Thermodynamique appliquée et introduction aux machines thermiques</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHIM0071-4</td>
<td>Reduction of pollutants from combustion - Angélique LÉONARD - [1d FW]</td>
<td>B1 Q1</td>
<td>30</td>
</tr>
<tr>
<td>MECA0006-1</td>
<td>Thermal Machines and Systems - Vincent LEMORT - [4h Proj.]</td>
<td>B1 Q1</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Corequisite: MECA0046-1 - Echangeurs de chaleur : aspects réseaux d'échangeurs et U.R.E.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECA0462-2</td>
<td>Materials selection (english language) - Anne MERTENS, Davide RUFFONI - [30h Proj., 1d FW]</td>
<td>B1 Q1</td>
<td>30</td>
</tr>
<tr>
<td>ELEC0014-3</td>
<td>Introduction to electric power and energy systems (english language) - Thierry VAN CUTSEM - [1d FW]</td>
<td>B1 Q1</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Corequisite: ELEC0431-2 - Electromagnetic energy conversion ELEC0053-2 - Circuits électriques</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECA0467-1</td>
<td>Turbomachines - Olivier LÉONARD</td>
<td>B1 Q2</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Corequisite: MECA0002-1 - Thermodynamique appliquée et introduction aux machines thermiques</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYST0003-1</td>
<td>Linear control systems (english language) - Guillaume DRION - [6h Labo.]</td>
<td>B1 Q1</td>
<td>30</td>
</tr>
<tr>
<td>ATFE2003-1</td>
<td>Final work - COLLEGIALITÉ, Pierre DEWALLEF - [750h Proj.]</td>
<td>B2 TA</td>
<td></td>
</tr>
<tr>
<td>ASTG0117-1</td>
<td>Integration internship (english language) - Pierre DEWALLEF</td>
<td>B2 TA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Corequisite: GEST3162-1 - Principles of management ATFE2003-1 - Travail de fin d'études</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEST3162-1</td>
<td>Principles of management (english language) - Michael GHILISSEN, Didier VAN CAILLIE</td>
<td>B2 Q1</td>
<td>25</td>
</tr>
</tbody>
</table>

### Optional courses (B1 : 30Cr, B2 : 25Cr)

Choose one focus from the following: (B1 : 30Cr)

**Professional focus in energetics (B1 : 30Cr)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Corequisite: MECA0046-1 - Echangeurs de chaleur : aspects réseaux d'échangeurs et U.R.E.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MECA0450-3 - Renewable energies MECA0006-1 - Machines et systèmes thermiques</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MECA0037-1</td>
<td>Thermal power stations and cogeneration - Pierre DEWALLEF, Angélique LÉONARD - [12h Proj.]</td>
<td>B1 Q2</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Corequisite: MECA0002-1 - Thermodynamique appliquée et introduction aux machines thermiques</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Choose courses totalling 25 credits from the elective courses list. (B2 : 25Cr)

Students who have not followed the courses MECA0002-1, ELEC0053-2 and ELEC0431-2 from the bachelor in civil engineering programme or acquired the equivalent knowledge and skills have to choose in priority these three courses in their study programme ; these courses are corequisites of compulsory courses of the master.

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**MECA0002-1**  
*Applied Thermodynamics and Introduction to Heat Engines* - Olivier LÉONARD

**ELEC0053-2**  
*Electric circuits* - Patricia ROUSSEAU X - Suppl :
### Electromagnetic energy conversion

**ELEC0431-2**  
*Electromagnetic energy conversion* (english language) - Christophe GEUZAIN

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Language</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC0431-2</td>
<td>Electromagnetic energy conversion</td>
<td>English</td>
<td>5</td>
</tr>
</tbody>
</table>

#### Language courses

Maximum five language course credits from among the list below or from among the ISLV courses in other faculties:

1. **LANG1957-1**  
   *Dutch for Engineers, part 1* (Dutch language) - Claudine COLIN

2. **LANG2978-1**  
   *Dutch for engineer, part 2* - Claudine COLIN

3. **LANG1958-1**  
   *German for engineer, Part 1* (German language) - Françoise CARL

4. **LANG2979-1**  
   *German for engineers, part 2* - Françoise CARL, ISLV

#### Power production, transport and distribution

1. **CHIM0664-1**  
   *Electrochemical energy conversion and storage* (English language) - Nathalie JOB

2. **ELEC0041-1**  
   *Modelling and design of electromagnetic systems* (English language) - Patrick DULAR, Christophe GEUZAIN

3. **GENU0018-3**  
   *Nuclear Engineering and Nuclear Power Plant Technology* - Pierre DEWALLEF

   **Corequisite:** MECA0037-1 - Centrales thermiques et cogénération

4. **ELEC0047-1**  
   *Electric power systems dynamics, control and stability* (English language) - Thierry VAN CUTSEM

   **Prerequisite:** ELEC0014-3 - Introduction to electric power and energy systems

   **Corequisite:** ELEC0029-2 - Electric power systems analysis

5. **ELEC0055-1**  
   *Element of power Electronics* (English language) - Fabrice FREBEL

6. **MECA0033-1**  
   *Heat and Material Transfer Modelling* - N...

7. **ELEC0029-2**  
   *Electric power systems analysis* (English language) - Thierry VAN CUTSEM

   **Prerequisite:** ELEC0014-3 - Introduction to electric power and energy systems

8. **ELEC0436-1**  
   *Electric Energy Management Systems* (English language) - Patricia ROUSSEAU

   **Prerequisite:** ELEC0014-3 - Introduction to electric power and energy systems

9. **ELEC0445-1**  
   *High Voltage Direct Current (HVDC) grids* (English language) - Patricia ROUSSEAU

#### Rational use of energy in buildings and industry

1. **ARCH0117-1**  
   *Introduction to building thermals* - JeanMarie HAUGLUSTAIN

2. **MECA0034-1**  
   *Rational use of energy in buildings* - Vincent LÉMORT

3. **ELEN0074-1**  
   *Sensors, microsensors and instrumentation* (English language) - Philippe VANDERBEMDEN

#### Advanced modeling and simulation

1. **MECA0032-1**  
   *Flow in turbomachineries* (English language) - Olivier LÉONARD

2. **MECA0124-1**  
   *Combustion Modelling* - Philippe NGENDAKUMANA

3. **MECA0514-1**  
   *Introduction to dynamic modeling of thermal systems* - Sylvain QUOILIN (Odd years)
Corequisite:
MECA0006-1 - Machines et systèmes thermiques

MECA0515-1 *Advanced thermal systems* (english language) - Vincent LEMORT

Prerequisite:
MECA0006-1 - Machines et systèmes thermiques

MATH0461-2 *Introduction to numerical optimization* (english language) - Quentin LOUVEAUX - [25h Proj.]

**Other optional courses**

MECA0018-2 *Manufacturing processes* (english language) - Yves MARCHAL - [15h Labo., 11h Proj., 0,5d FW]

MECA0027-1 *Structural and multidisciplinary optimization* (english language) - Pierre DUYSINX, Patricia TOSSINGS - [18h Proj.]

PROJ0011-2 *Personal student project* (english language) - [150h Proj.]

Choose one course from the course’s programme of other master of the Faculty of Applied Sciences (with the approval of the cycle’s Jury president)

**Sustainable automotive engineering**

*Notice:* cette liste de cours est réservée aux étudiants inscrits au bloc 1 du master en 2016-2017 et ayant déjà suivi la Finalité spécialisée en génie mécanique.

MECA0494-3 *Vehicle components I* (english language) - Olivier BRULS, Pierre DUYSINX

Corequisite:
MECA0492-2 - Vehicle dynamics
MECA0493-2 - Vehicle aerodynamics
MECA0496-2 - Materials for automotive applications

MECA0492-2 *Vehicle dynamics* (english language) - Pierre DUYSINX

MECA0493-2 *Vehicle aerodynamics* (english language) - Grigorios DIMITRIADIS

Corequisite:
MECA0492-2 - Vehicle dynamics
MECA0494-3 - Vehicle components I
MECA0496-2 - Materials for automotive applications

MECA0496-2 *Materials for automotive applications* (english language)

Corequisite:
MECA0492-2 - Vehicle dynamics
MECA0493-2 - Vehicle aerodynamics
MECA0494-3 - Vehicle components I

MECA0497-2 *Vehicle performance* (english language) - Mustapha BELHABIB, Pierre DUYSINX - [1d FW]

Corequisite:
MECA0498-2 - Internal combustion engines
MECA0499-2 - Electric traction motors
MECA0500-2 - Hybrid electric and fuel cell vehicles
MECA0501-1 - Thermal and Electrical Management of vehicles

MECA0498-2 *Internal combustion engines* (english language) - Philippe NGENDAKUMANA

Corequisite:
MECA0497-2 - Vehicle performance
MECA0499-2 - Electric traction motors
MECA0500-2 - Hybrid electric and fuel cell vehicles
MECA0501-1 - Thermal and Electrical Management of vehicles

MECA0499-2 *Electric traction motors* (english language) - Johan GYSELINCK

Corequisite:
MECA0497-2 - Vehicle performance
MECA0498-2 - Internal combustion engines
Additional ECTS Master in electro-mechanical engineering

Optional courses (B0 : 60Cr)

Each student’s programme will be determined by the jury depending on their prior training. If an applicant does not meet certain prerequisites, his or her programme may include up to 60 additional course credits essentially taken from the list below : (B0 : 60Cr)

- **MECA0445-2**  *Heat transfer* (english language) - Pierre DEWALLEF, Vincent TERRAPON - [4h Labo., 9h Proj.]
  B0 Q2 30 26 [+] 5

- **MECA0012-6**  *Solid mechanics* - Laurent DUChENE - [15h Proj.]
  B0 Q2 30 30 [+] 5

- **ELEC0052-2**  *Analysis and Design of Electrical Measuring Systems* - Philippe VANDERBEMDEN - [24h Labo.]
  B0 Q1 30 6 [+] 5

- **MECA0025-3**  *Fluid Mechanics* - Eric DELHEZ - [30h Proj.]
  B0 Q2 30 30 [+] 5

- **MECA0036-2**  *Finite Element Method* (english language) - JeanPhilippe PONTHOT - [40h Proj.]
  B0 Q2 30 30 [+] 5

- **MECA0155-2**  *Dynamics of Mechanical Systems* - JeanClaude GOLINVAL - [5h Labo., 10h Proj.]
  B0 Q1 30 30 [+] 5

- **PHYS0904-4**  *Physics of materials* - Anne MERTENS - [1d FW]
  B0 Q2 30 30 [+] 5

- **MATH0006-3**  *Introduction to numerical analysis* (english language) - Quentin LOUEVAUX
  B0 Q1 20 20 - 4

- **MECA0001-2**  *Mechanics of materials* - JeanPierre JASPART - [2h Labo., 12h Proj.]
  B0 Q1 30 28 [+] 5

- **LANG0039-2**  *English 2* (english language) - Christine FILOT, ISLV - [20h Proj.]
  B0 TA - 30 [+] 3

Choose maximum 13 credits to complete the curriculum