

#### Block view of the study programme

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#### Block 1

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's degree in Mechanical Engineering, each student must take or validate the 70 credits of the common core (including internship and Master's thesis), 10 credits of optional courses, 10 credits from the Mechanical Engineering, Mechatronics 2, Computational Mechanics 2 and Vehicles and Transport lists or from the block 1 programme, and 30 credits of the research focus.

Ideally, students starting the Master's programme will have acquired the skills and knowledge corresponding to the 40 credits of technical courses specific to the "Mechanical" field, organised within the Bachelor's degree in Civil Engineering.

#### Core curriculum compulsory courses

|            |                                                                                                                                                                                           |    |    |    |     |   |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|-----|---|
| MECA0029-1 | <i>Theory of vibration</i> (english language) - Loïc SALLES - [30h Proj.]<br><b>Corequisite :</b><br>MECA0036-2 - Finite Element Method<br>MECA0155-2 - Dynamique des systèmes mécaniques | Q1 | 26 | 26 | [+] | 5 |
| MECA0462-2 | <i>Materials selection</i> (english language) - Anne MERTENS, Davide RUFFONI - [30h Proj., 1d FW]                                                                                         | Q1 | 26 | 26 | [+] | 5 |
| GEST3162-1 | <i>Principles of management</i> (english language) - Michaël PARMENTIER, Willem STANDAERT - [25h Proj.]                                                                                   | Q1 | 30 | -  | [+] | 5 |
| MECA0018-2 | <i>Manufacturing processes</i> (english language) - Yves MARCHAL - [15h Labo., 11h Proj., 0,5d FW]                                                                                        | Q2 | 30 | -  | [+] | 5 |
| SYST0022-1 | <i>Linear Systems Design</i> (english language) - Guillaume DRION, Pierre SACRÉ - [15h Proj.]                                                                                             | Q2 | 26 | 26 | [+] | 5 |

[...] Choose one course from PROJ0022-1 and PROJ0023-1.

|            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |    |    |    |   |    |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|---|----|
| PROJ0022-1 | <i>Integrated mechanical engineering project</i><br>- <i>Advanced mechanical design</i> - Pierre DUPONT<br>- <i>Integrated mechanical engineering project</i> - Maarten ARNST, Eric BÉCHET, Olivier BRULS, Christophe COLLETTE, Pierre DUYSINX, Tristan GILET, Loïc SALLES, Jean STUTO - [250h Proj., 5d FW]<br><b>Prerequisite :</b><br>MECA0444-1 - Conception mécanique<br><b>Corequisite :</b><br>MECA0018-2 - Manufacturing processes<br>MECA0462-2 - Materials selection | TA | 30 | 15 | - | 15 |
| PROJ0023-1 | <i>Integrated project in mechanical engineering (Service Learning)</i><br>- <i>Advanced mechanical design</i> - Pierre DUPONT<br>- <i>Integrated project in mechanical engineering</i> - Maarten ARNST, Eric BÉCHET, Olivier BRULS, Christophe COLLETTE, Pierre DUYSINX, Tristan GILET, Loïc SALLES, Jean STUTO - [250h Proj., 5d FW]                                                                                                                                          | TA | 30 | 15 | - | 15 |

#### Common core courses

Choose courses totalling 10 credits out of the following :

Students who have not followed the courses MECA0155-2 and MECA0036-2 from the "Mechanics" option of the bachelor in civil engineering programme or acquired the equivalent knowledge and skills have to choose in priority these two courses in their study programme ; these courses are corequisites of compulsory courses of the master.

|            |                                                                                                                                                      |    |    |    |     |   |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|-----|---|
| MECA0155-2 | <i>Dynamics of mechanical systems</i> - Loïc SALLES - [20h Proj.]                                                                                    | Q1 | 26 | 26 | [+] | 5 |
| MECA0036-2 | <i>Finite Element Method</i> (english language) - JeanPhilippe PONTHOT - [40h Proj.]                                                                 | Q2 | 26 | 26 | [+] | 5 |
| MECA0027-1 | <i>Structural and multidisciplinary optimization</i> (english language) - Pierre DUYSINX, Patricia TOSSINGS - Suppl : Michaël BRUYNEEL - [18h Proj.] | Q1 | 30 | 12 | [+] | 5 |

### Master MSc. in Mechanical Engineering, professional focus in sustainable automotive engineering

#### Corequisite :

MECA0155-2 - Dynamique des systèmes mécaniques

MECA0036-2 - Finite Element Method

|            |                                                                                               |    |    |    |     |   |
|------------|-----------------------------------------------------------------------------------------------|----|----|----|-----|---|
| MECA0031-2 | <i>Kinematics and dynamics of mechanisms</i> (english language) - Olivier BRULS - [40h Proj.] | Q2 | 30 | 20 | [+] | 5 |
|------------|-----------------------------------------------------------------------------------------------|----|----|----|-----|---|

#### Corequisite :

MECA0155-2 - Dynamique des systèmes mécaniques

MECA0036-2 - Finite Element Method

|            |                                                                                         |    |    |    |     |   |
|------------|-----------------------------------------------------------------------------------------|----|----|----|-----|---|
| MECA0023-1 | <i>Advanced solid mechanics</i> (english language) - JeanPhilippe PONTHOT - [30h Proj.] | Q1 | 26 | 26 | [+] | 5 |
|------------|-----------------------------------------------------------------------------------------|----|----|----|-----|---|

#### Corequisite :

MECA0155-2 - Dynamique des systèmes mécaniques

MECA0036-2 - Finite Element Method

|            |                                                                                                             |    |    |    |     |   |
|------------|-------------------------------------------------------------------------------------------------------------|----|----|----|-----|---|
| MECA0010-1 | <i>Uncertainty quantification and stochastic modelling</i> (english language) - Maarten ARNST - [28h Proj.] | Q1 | 16 | 16 | [+] | 5 |
|------------|-------------------------------------------------------------------------------------------------------------|----|----|----|-----|---|

#### Corequisite :

MECA0155-2 - Dynamique des systèmes mécaniques

MECA0036-2 - Finite Element Method

#### Focus courses

Choose 10 credits among:

|            |                                                                                                               |    |    |    |     |   |
|------------|---------------------------------------------------------------------------------------------------------------|----|----|----|-----|---|
| MECA0525-1 | <i>Performance and dynamics of vehicles</i> (english language) - Pierre DUYSINX - [4h Labo., 8h Proj., 1d FW] | Q2 | 30 | 15 | [+] | 5 |
|------------|---------------------------------------------------------------------------------------------------------------|----|----|----|-----|---|

|            |                                                                               |    |    |    |     |   |
|------------|-------------------------------------------------------------------------------|----|----|----|-----|---|
| MECA0041-1 | <i>Internal combustion engine</i> (english language)                          | Q2 |    |    |     | 5 |
|            | - <i>Part 1 Fundamental aspects</i> - Marc NÉLIS - [1d FW, 15h Proj.]         |    | 15 | 15 | [+] |   |
|            | - <i>Part 2 Application to propulsion</i> - Marc NÉLIS - [10h Proj., 0,5d FW] |    | 10 | 10 | [+] |   |

|            |                                                                                               |    |    |    |     |   |
|------------|-----------------------------------------------------------------------------------------------|----|----|----|-----|---|
| MECA0063-1 | <i>Vehicle architecture and components</i> (english language) - Emmanuel TROMME - [30h Proj.] | Q2 | 30 | 30 | [+] | 5 |
|------------|-----------------------------------------------------------------------------------------------|----|----|----|-----|---|

#### Block 2

#### Core curriculum compulsory courses

|            |                                                            |    |   |  |     |    |
|------------|------------------------------------------------------------|----|---|--|-----|----|
| ATFE0013-1 | <i>Master thesis and internship</i>                        | TA |   |  |     | 30 |
|            | - <i>Master thesis</i> - Tristan GILET - [750h Proj.]      | -  | - |  | [+] |    |
|            | - <i>Professional integration internship</i> - Eric BÉCHET | -  | - |  | -   |    |

**Prerequisite :**  
 MECA0036-2 - Finite Element Method  
 MECA0155-2 - Dynamique des systèmes mécaniques

#### Common core courses

Choose courses for a total of 10 credits from the Mechanical Engineering, Mechatronics 2, Computational Mechanics 2 and Vehicles and Transport lists, or from the block 1 programme.

**Students who have not followed the MECA0444-1 course in the ¿Mechanics¿ option of the Civil Engineering programme or acquired the corresponding knowledge and skills must first incorporate this course into their programme; this course is a co-requisite for the compulsory courses for ¿Mechanical Engineering¿ and ¿Sustainable Automotive Engineering¿ focuses.**

|            |                                                                                                      |    |    |   |     |   |
|------------|------------------------------------------------------------------------------------------------------|----|----|---|-----|---|
| MECA0444-1 | <i>Mechanical design</i> - Eric BÉCHET, Pierre DUYSINX, Jean STUTO - [15h Labo., 11h Proj., 0,5d FW] | Q2 | 30 | - | [+] | 5 |
|------------|------------------------------------------------------------------------------------------------------|----|----|---|-----|---|

#### Language module

[...] Maximum 5 credits from the language courses programme organised by ISLV in other faculties or from the restricted list below

|            |                                                                        |    |    |   |   |   |
|------------|------------------------------------------------------------------------|----|----|---|---|---|
| LANG1957-1 | <i>Dutch for Engineers, part 1</i> (dutch language) - Claudine COLIN   | Q1 | 36 | - | - | 3 |
| LANG1958-1 | <i>German for Engineers, Part 1</i> (german language) - Françoise CARL | Q1 | 36 | - | - | 3 |
| LANG2978-1 | <i>Dutch for Engineers, part 2</i> (dutch language) - Claudine COLIN   | Q2 | 24 | - | - | 2 |

### Master MSc. in Mechanical Engineering, professional focus in sustainable automotive engineering

#### Corequisite :

LANG1957-1 - Néerlandais pour l'ingénieur, partim 1

LANG2979-1 *German for Engineers, part 2* (german language) - Françoise CARL Q2 24 - - 2

#### Corequisite :

LANG1958-1 - Allemand pour l'ingénieur, partim 1

#### Mechanical engineering

MECA0473-1 *Metallic materials engineering* - Anne MERTENS Q1 26 26 - 5

MECA0139-1 *Additive manufacturing and 3D printing* (english language) - Anne MERTENS Q1 26 26 - 5

MECA0035-1 (pas organisé en 2025-2026) *Lubrication and tribology* Q1 26 26 - 5

MECA0006-1 *Cooling and low-temperature heating systems* (english language) - Vincent LEMORT - [4h Proj., 1d FW] Q2 26 26 [+] 5

CHIM0699-2 *Life cycle assessment - Ecodesign* (english language) - Angélique LÉONARD Q1 10 30 - 3

MECA0502-1 *Mechanics of composites* (english language) - Michaël BRUYNEEL Q1 26 26 - 5

MECA0532-1 *Turbomachines* - Koen HILLEWAERT Q1 26 26 - 5

MECA0533-1 *Technology of offshore wind structures* (english language) - Timothée PIRE Q1 26 26 - 5

#### Prerequisite :

MECA0462-2 - Materials selection

MECA0155-2 - Dynamique des systèmes mécaniques

MECA0534-1 *Fluid structures interactions of offshore environment* (english language) - Thomas ANDRIANNE - [12h Labo.] Q1 20 16 [+] 5

#### Prerequisite :

MECA0025-3 - Mécanique des fluides

MECA0029-1 - Theory of vibration

MECA0535-1 *Structural health monitoring* (english language) - Wout WEIJTJENS Q1 26 26 - 5

#### Prerequisite :

MECA0029-1 - Theory of vibration

#### Mecatronic 2

ELEC0055-2 *Element of power Electronics, Part A* (english language) - Fabrice FREBEL Q1 30 6 - 3

MECA0517-1 *Advanced industrial robotics* (english language) - Olivier BRULS - [10h Proj.] Q1 30 20 [+] 5

INFO0948-2 *Introduction to intelligent robotics* (english language) - Pierre SACRÉ - [80h Proj.] Q2 30 4 [+] 5

INFO0064-2 *Embedded systems* (english language) - Bernard BOIGELOT Q1 25 20 - 3

#### Corequisite :

INFO2055-1 - Embedded systems project

INFO2055-1 *Embedded systems project* (english language) - Bernard BOIGELOT - [60h Proj.] Q2 - - [+] 2

#### Corequisite :

INFO0064-2 - Embedded systems

GBIO0012-2 *Biomechanics* (english language) - Davide RUFFONI - [1d FW] Q1 26 26 [+] 5

MECA0516-1 *Mechanical properties of biological and bioinspired materials* (english language) - Davide RUFFONI - [4h Labo.] Q1 26 22 [+] 5

GBIO0022-1 *Biomimicry* (english language) - Philippe COMPÈRE, Tristan GILET, Davide RUFFONI - [45h Proj.] TA 15 - [+] 5

MECA0008-1 *Microfluidics* (english language) - Tristan GILET - [16h Labo., 14h Proj.] Q2 22 8 [+] 5

PROT0430-3 *Biomedical robotics and active prostheses* (english language) - Olivier BRULS Q1 15 10 - 3

### Master MSc. in Mechanical Engineering, professional focus in sustainable automotive engineering

|                                    |                                                                   |    |    |    |   |   |
|------------------------------------|-------------------------------------------------------------------|----|----|----|---|---|
| MECA0127-1                         | <i>Active structures</i> (english language) - Christophe COLLETTE | Q1 | 26 | 26 | - | 5 |
| <b>Prerequisite :</b>              |                                                                   |    |    |    |   |   |
| SYST0022-1 - Linear Systems Design |                                                                   |    |    |    |   |   |

#### Computational mechanics 2

|                                  |                                                                                                          |    |    |    |     |   |
|----------------------------------|----------------------------------------------------------------------------------------------------------|----|----|----|-----|---|
| MECA0464-1                       | <i>Large deformation of solids</i> (english language) - Romain BOMAN, JeanPhilippe PONTHOT - [60h Proj.] | Q1 | 26 | 26 | [+] | 5 |
| MECA0058-1                       | <i>Fracture mechanics, damage and fatigue</i> (english language) - Ludovic NOELS - [75h Proj.]           | Q1 | 30 | 10 | [+] | 5 |
| MECA0062-1                       | <i>Vibration testing and experimental modal analysis</i> (english language) - Loïc SALLES - [30h Proj.]  | Q1 | 26 | 26 | [+] | 5 |
| <b>Prerequisite :</b>            |                                                                                                          |    |    |    |     |   |
| MECA0029-1 - Theory of vibration |                                                                                                          |    |    |    |     |   |
| MECA0524-1                       | <i>CAD &amp; Geometric Algorithms</i> - Eric BÉCHET - [60h Proj.]                                        | Q1 | 20 | 20 | [+] | 5 |
| AERO0015-1                       | <i>Mechanical design of turbomachinery</i> (english language) - Loïc SALLES - [30h Proj.]                | Q1 | 26 | 26 | [+] | 5 |

#### Vehicles and transport

|            |                                                                                                            |    |    |    |     |   |
|------------|------------------------------------------------------------------------------------------------------------|----|----|----|-----|---|
| MECA0501-1 | <i>Thermal Energy Management in vehicles</i> (english language) - Vincent LEMORT - [1d FW]                 | Q1 | 26 | 26 | [+] | 5 |
| MECA0063-1 | <i>Vehicle architecture and components</i> (english language) - Emmanuel TROMME - [30h Proj.]              | Q2 | 30 | 30 | [+] | 5 |
| GCIV2066-1 | <i>Fundamentals of transportation : transport planning</i> (english language) - Mario COOLS                | Q1 | 15 | 15 | -   | 2 |
| MECA0527-1 | <i>Electric, hybrid and fuel cell vehicles</i> (english language) - Pierre DUYSINX - [5h Labo., 15h Proj.] | Q1 | 30 | 10 | [+] | 5 |

[...] Courses from B1

[...] Maximum 5 credits in the list of courses from other master's degrees in the faculty of Applied Sciences or du catalogue UNIC.

#### Focus courses

Choose 20 credits from:

|            |                                                                                                            |    |    |    |     |   |
|------------|------------------------------------------------------------------------------------------------------------|----|----|----|-----|---|
| MECA0501-1 | <i>Thermal Energy Management in vehicles</i> (english language) - Vincent LEMORT - [1d FW]                 | Q1 | 26 | 26 | [+] | 5 |
| AERO0001-1 | <i>Aerodynamics</i> (english language) - Thomas ANDRIANNE, Vincent TERRAPON - [2h Labo., 25h Proj.]        | Q1 | 27 | 25 | [+] | 5 |
| MECA0527-1 | <i>Electric, hybrid and fuel cell vehicles</i> (english language) - Pierre DUYSINX - [5h Labo., 15h Proj.] | Q1 | 30 | 10 | [+] | 5 |
| ELEC0431-2 | <i>Electromagnetic energy conversion</i> (english language) - Christophe GEUZAIN - [15h Labo.]             | Q2 | 30 | 15 | [+] | 5 |
| MECA0062-1 | <i>Vibration testing and experimental modal analysis</i> (english language) - Loïc SALLES - [30h Proj.]    | Q1 | 26 | 26 | [+] | 5 |

#### Bloc d'aménagement du programme de l'année

### Bridging courses Master in mechanical engineering

#### Optional courses

[...] Choose up to 30 credits from the following list:

|            |                                                                          |    |    |    |     |   |
|------------|--------------------------------------------------------------------------|----|----|----|-----|---|
| MECA0036-2 | <i>Finite Element Method</i> (english language) - JeanPhilippe PONTHOT - | Q2 | 26 | 26 | [+] | 5 |
|------------|--------------------------------------------------------------------------|----|----|----|-----|---|

[40h Proj.]

|            |                                                                                                                                                                                                          |    |    |    |     |   |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|-----|---|
| MECA0155-2 | <i>Dynamics of mechanical systems</i> - Loïc SALLES - [20h Proj.]                                                                                                                                        | Q1 | 26 | 26 | [+] | 5 |
| MECA0012-6 | <i>Solid mechanics</i> - Laurent DUCHENE - [15h Proj.]                                                                                                                                                   | Q2 | 26 | 26 | [+] | 5 |
| MECA0444-1 | <i>Mechanical design</i> - Eric BÉCHET, Pierre DUYSINX, Jean STUTO - [15h Labo., 11h Proj., 0,5d FW]                                                                                                     | Q2 | 30 | -  | [+] | 5 |
| MECA0002-1 | <i>Applied Thermodynamics and Introduction to Heat Engines</i> - Vincent LEMORT                                                                                                                          | Q1 | 26 | 26 | -   | 5 |
| MECA0445-2 | <i>Heat transfer</i> (english language) - Pierre DEWALLEF, Vincent TERRAPON - [9h Proj.]                                                                                                                 | Q2 | 28 | 24 | [+] | 5 |
| MATH0006-3 | <i>Introduction to numerical analysis</i> (english language) - Quentin LOUVEAUX                                                                                                                          | Q1 | 20 | 20 | -   | 4 |
| MECA0001-2 | <i>Mechanics of materials</i> - JeanFrançois DEMONCEAU, Laurent DUCHENE - [2h Labo., 12h Proj.]                                                                                                          | Q1 | 27 | 25 | [+] | 5 |
| LANG0039-2 | <i>English 2, English for Engineering</i> (english language) - Clara BRERETON, Véronique DOPPAGNE, Pascale DRIANNE, Stéphane GHIJSEN, Philippe JEUKENNE, Martin POLSON, David VANMANSHOVEN - [20h Proj.] | TA | -  | 30 | [+] | 3 |
| LANG0840-1 | <i>French, S1 - 1er quadrimestre</i> - ISLV, Marielle MARÉCHAL                                                                                                                                           | Q1 | -  | -  | -   | 5 |
| SYST0002-2 | <i>Introduction to signals and systems</i> - Guillaume DRION, Alessio FRANCI - [15h Proj.]                                                                                                               | Q2 | 26 | 26 | [+] | 5 |
| PHYS0904-4 | <i>Physics of materials</i> - Luc COURARD, Anne MERTENS - [1d FW]                                                                                                                                        | Q2 | 26 | 26 | [+] | 5 |
| MECA0025-3 | <i>Fluid Mechanics</i> - Eric DELHEZ - [30h Proj.]                                                                                                                                                       | Q2 | 26 | 26 | [+] | 5 |

## Bridging courses Master in mechanical engineering

*Notice* : 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 credits of bridging courses, essentially taken from the list below :

### Optional courses

[...] Choose 31 to 60 credits from:

|            |                                                                                                                                                                         |    |    |    |     |   |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|-----|---|
| MECA0036-2 | <i>Finite Element Method</i> (english language) - JeanPhilippe PONTROT - [40h Proj.]                                                                                    | Q2 | 26 | 26 | [+] | 5 |
| MECA0155-2 | <i>Dynamics of mechanical systems</i> - Loïc SALLES - [20h Proj.]                                                                                                       | Q1 | 26 | 26 | [+] | 5 |
| MECA0012-6 | <i>Solid mechanics</i> - Laurent DUCHENE - [15h Proj.]                                                                                                                  | Q2 | 26 | 26 | [+] | 5 |
| MECA0444-1 | <i>Mechanical design</i> - Eric BÉCHET, Pierre DUYSINX, Jean STUTO - [15h Labo., 11h Proj., 0,5d FW]                                                                    | Q2 | 30 | -  | [+] | 5 |
| MECA0002-1 | <i>Applied Thermodynamics and Introduction to Heat Engines</i> - Vincent LEMORT                                                                                         | Q1 | 26 | 26 | -   | 5 |
| MECA0445-2 | <i>Heat transfer</i> (english language) - Pierre DEWALLEF, Vincent TERRAPON - [9h Proj.]                                                                                | Q2 | 28 | 24 | [+] | 5 |
| MATH0006-3 | <i>Introduction to numerical analysis</i> (english language) - Quentin LOUVEAUX                                                                                         | Q1 | 20 | 20 | -   | 4 |
| MECA0001-2 | <i>Mechanics of materials</i> - JeanFrançois DEMONCEAU, Laurent DUCHENE - [2h Labo., 12h Proj.]                                                                         | Q1 | 27 | 25 | [+] | 5 |
| LANG0039-2 | <i>English 2, English for Engineering</i> (english language) - Clara BRERETON, Véronique DOPPAGNE, Pascale DRIANNE, Stéphane GHIJSEN, Philippe JEUKENNE, Martin POLSON, | TA | -  | 30 | [+] | 3 |

**Master MSc. in Mechanical Engineering, professional focus in sustainable automotive engineering**

ANMANSHOVEN - [20h Proj.]

|            |                                                                                            |    |    |    |     |   |
|------------|--------------------------------------------------------------------------------------------|----|----|----|-----|---|
| LANG0840-1 | <i>French, S1 - 1er quadrimestre</i> - ISLV, Marielle MARÉCHAL                             | Q1 | -  | -  | -   | 5 |
| SYST0002-2 | <i>Introduction to signals and systems</i> - Guillaume DRION, Alessio FRANCI - [15h Proj.] | Q2 | 26 | 26 | [+] | 5 |
| PHYS0904-4 | <i>Physics of materials</i> - Luc COURARD, Anne MERTENS - [1d FW]                          | Q2 | 26 | 26 | [+] | 5 |
| MECA0025-3 | <i>Fluid Mechanics</i> - Eric DELHEZ - [30h Proj.]                                         | Q2 | 26 | 26 | [+] | 5 |