

Cycle view of the study programme

B1 Or Th Pr Au Cr

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.

Within the framework of their Master in Electro-mechanical Engineering, all students must follow or validate the 65 credits of joint training (including placement and final year dissertation), the 25 credits of optional courses, and the 30 credits of the professional focus.

Ideally, students studying for the master's degree will have acquired the competences and knowledge corresponding to the 50 credits of technical courses specific to the field of 'Mechanics' and 'Electricity', taught within the framework of the Bachelor in Civil Engineering.

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

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|------------|---|----|----|----|----|-----|----|
| MECA0522-1 | <i>Heat exchangers, constructive and fundamental aspects</i> - Philippe NGENDAKUMANA - [16h Proj.] Corequisite : MECA0002-1 - Thermodynamique appliquée et introduction aux machines thermiques | B1 | Q1 | 15 | 15 | [+] | 3 |
| CHIM0071-4 | <i>Reduction of pollutants from combustion</i> - Angélique LÉONARD - [1d FW] | B1 | Q1 | 30 | - | [+] | 3 |
| MECA0006-1 | <i>Thermal Machines and Systems</i> - Vincent LEMORT - [4h Proj.] Corequisite : MECA0522-1 - Echangeurs de chaleur : aspects fondamentaux et constructifs | B1 | Q1 | 26 | 26 | [+] | 5 |
| MECA0462-2 | <i>Materials selection</i> (english language) - Anne MERTENS, Davide RUFFONI - [30h Proj., 1d FW] | B1 | Q1 | 26 | 26 | [+] | 5 |
| ELEC0014-3 | <i>Introduction to electric power and energy systems</i> (english language) - Thierry VAN CUTSEM - [1d FW] Corequisite : ELEC0053-2 - Circuits électriques ELEC0431-2 - Electromagnetic energy conversion | B1 | Q1 | 28 | 12 | [+] | 4 |
| MECA0467-1 | <i>Turbomachines</i> - Koen HILLEWAERT Corequisite : MECA0002-1 - Thermodynamique appliquée et introduction aux machines thermiques | B1 | Q2 | 26 | 26 | - | 5 |
| SYST0003-1 | <i>Linear control systems</i> (english language) - Part A - Guillaume DRION - Part C - Guillaume DRION - [6h Labo.] | B1 | Q1 | 26 | 6 | - | 5 |
| ATFE2003-1 | <i>Master Thesis</i> - COLLÉGIALITÉ, Pierre DEWALLEF - [750h Proj.] | B2 | TA | - | - | [+] | 25 |
| ASTG0117-1 | <i>Integration internship</i> (english language) - Pierre DEWALLEF Corequisite : ATFE2003-1 - Travail de fin d'études GEST3162-1 - Principles of management | B2 | TA | - | - | - | 5 |
| GEST3162-1 | <i>Principles of management</i> (english language) - Michael GHILISSEN, François PICHHAULT | B2 | Q1 | 25 | 25 | - | 5 |

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

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

Professional focus in energetics (B1 : 30Cr)

| | | | | | | | |
|------------|---|----|----|----|----|-----|---|
| APRI0003-2 | <i>Energetics Integrated Project</i> - Pierre DEWALLEF, Vincent LEMORT, Philippe NGENDAKUMANA - [5d FW] Corequisite : MECA0006-1 - Machines et systèmes thermiques MECA0450-3 - Renewable energies MECA0522-1 - Echangeurs de chaleur : aspects fondamentaux et constructifs | B1 | TA | 30 | 80 | [+] | 8 |
| MECA0037-1 | <i>Thermal power stations and cogeneration</i> - Pierre DEWALLEF, Angélique LÉONARD - [12h Proj.] | B1 | Q2 | 24 | 24 | [+] | 5 |

Corequisite :

MECA0522-1 - Echangeurs de chaleur : aspects fondamentaux et constructifs

MECA0467-1 - Turbomachines

MECA0002-1 - Thermodynamique appliquée et introduction aux machines thermiques

MECA0046-1 *Heat exchangers : networks and rational use of energy* - MarieNoëlle DUMONT - [20h Proj.] B1 Q2 15 5 [+] 2

MECA0450-3 *Renewable energies* (english language) - Pierre DEWALLEF - [24h Proj., 1d FW] B1 Q1 24 12 [+] 5

ELEC0018-1 *Energy market* (english language) - Damien ERNST B1 Q2 39 13 - 5

MECA0041-1 *Internal combustion engine* - Philippe NGENDAKUMANA - [1,5d FW, 20h Proj.] B1 Q2 26 26 [+] 5

Corequisite :

MECA0002-1 - Thermodynamique appliquée et introduction aux machines thermiques

Professional focus on sustainable automotive engineering (for students who chose this specialisation in 2017-2018) (B1 : 30Cr)

MECA0492-3 *Vehicle dynamics* (english language) B1 Q2 15 10 - 2

MECA0497-3 *Vehicle performance* (english language) - Mustapha BELHABIB, Pierre DUYSINX - [1d FW] B1 Q2 25 15 [+] 3

Corequisite :

MECA0501-1 - Thermal and Electrical Management of vehicles

MECA0500-2 - Hybrid electric and fuel cell vehicles

MECA0499-2 - Electric traction motors

MECA0498-3 - Internal combustion engines

MECA0498-3 *Internal combustion engines* (english language) B1 Q2 25 15 - 3

Corequisite :

MECA0501-1 - Thermal and Electrical Management of vehicles

MECA0500-2 - Hybrid electric and fuel cell vehicles

MECA0499-2 - Electric traction motors

MECA0497-2 - Vehicle performance

MECA0499-2 *Electric traction motors* (english language) - Johan GYSELINCK B1 Q1 15 10 - 2

Corequisite :

MECA0501-1 - Thermal and Electrical Management of vehicles

MECA0500-2 - Hybrid electric and fuel cell vehicles

MECA0498-3 - Internal combustion engines

MECA0497-2 - Vehicle performance

MECA0500-4 *Hybrid electric and fuel cell vehicles* (english language) B1 Q1 25 15 - 2
 - Part A - Pierre DUYSINX, Nathalie JOB
 - Part B - 10 -

Corequisite :

MECA0501-1 - Thermal and Electrical Management of vehicles

MECA0499-2 - Electric traction motors

MECA0498-3 - Internal combustion engines

MECA0497-2 - Vehicle performance

MECA0501-1 *Thermal and Electrical Management of vehicles* (english language) - Vincent LEMORT B1 Q1 15 10 - 3

Corequisite :

MECA0500-2 - Hybrid electric and fuel cell vehicles

MECA0499-2 - Electric traction motors

MECA0498-3 - Internal combustion engines

MECA0497-2 - Vehicle performance

APRI0010-1 *Integrated project of automotive design* - Maarten ARNST, Eric BÉCHET, JeanLuc BOZET, Olivier BRULS, Christophe COLLETTE, Pierre DUYSINX, Tristan GILET, Davide RUFFONI, Jean STUTO - [250h Proj., 5d FW] B1 TA 50 - [+] 15

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.

| | | | | | | | |
|------------|---|----|----|----|----|-----|---|
| MECA0002-1 | <i>Applied Thermodynamics and Introduction to Heat Engines</i> - Vincent LEMORT | B2 | Q1 | 26 | 26 | - | 5 |
| ELEC0053-2 | <i>Electric circuits</i> - Bertrand CORNÉLUSSE | B2 | Q2 | 26 | 26 | - | 5 |
| ELEC0431-2 | <i>Electromagnetic energy conversion</i> (english language) - Christophe GEUZAINÉ - [15h Labo.] | B2 | Q2 | 30 | 15 | [+] | 5 |

Language courses

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

| | | | | | | | |
|------------|---|----|----|----|---|---|---|
| LANG1957-1 | <i>Dutch for Engineers, part 1</i> (dutch language) - Claudine COLIN | B2 | Q1 | 36 | - | - | 3 |
| LANG2978-1 | <i>Dutch for engineer, part 2</i> - Claudine COLIN | B2 | Q2 | 24 | - | - | 2 |
| LANG1958-1 | <i>German for engineer, Part 1</i> (german language) - Françoise CARL | B2 | Q1 | 36 | - | - | 3 |
| LANG2979-1 | <i>German for engineers, part 2</i> - Françoise CARL, ISLV | B2 | Q2 | 24 | - | - | 2 |

Power production, transport and distribution

| | | | | | | | |
|------------|--|----|----|----|----|-----|---|
| CHIM0664-1 | <i>Electrochemical energy conversion and storage</i> (english language) - Nathalie JOB - [15h Labo.] | B2 | Q1 | 15 | - | [+] | 3 |
| ELEC0041-1 | <i>Modelling and design of electromagnetic systems</i> (english language) - Christophe GEUZAINÉ | B2 | Q2 | 26 | 26 | - | 5 |
| GENU0018-3 | <i>Nuclear Engineering and Nuclear Power Plant Technology</i> - Pierre DEWALLEF Corequisite : MECA0037-1 - Centrales thermiques et cogénération | B2 | Q1 | 26 | 26 | - | 5 |
| ELEC0047-1 | <i>Electric power systems dynamics, control and stability</i> (english language) - Thierry VAN CUTSEM - [25h Proj.] Prerequisite : ELEC0014-3 - Introduction to electric power and energy systems Corequisite : ELEC0029-2 - Electric power systems analysis | B2 | Q1 | 30 | 8 | [+] | 5 |
| ELEC0055-1 | <i>Element of power Electronics</i> (english language) - Part A - Fabrice FREBEL - Part B - Fabrice FREBEL - [24h Proj.] | B2 | Q1 | 30 | 6 | - | 5 |
| MECA0033-1 | <i>Heat and Material Transfer Modelling</i> | B2 | Q2 | 26 | 26 | - | 5 |
| ELEC0029-2 | <i>Electric power systems analysis</i> (english language) - Thierry VAN CUTSEM - [25h Proj.] Prerequisite : ELEC0014-3 - Introduction to electric power and energy systems | B2 | Q2 | 23 | 4 | [+] | 3 |
| ELEC0436-1 | <i>Electric Energy Management Systems</i> (english language) - Patricia ROUSSEAU - Suppl : Louis WEHENKEL - [12h Labo., 20h Proj.] Prerequisite : ELEC0014-3 - Introduction to electric power and energy systems | B2 | Q1 | 20 | 16 | [+] | 5 |
| ELEC0445-1 | <i>High Voltage Direct Current (HVDC) grids</i> (english language) - Patricia ROUSSEAU | B2 | Q2 | 16 | 12 | - | 3 |
| ELEN0445-1 | <i>Microgrids</i> (english language) - Bertrand CORNÉLUSSE | B2 | Q1 | 18 | 18 | - | 5 |
| ARCH0117-1 | <i>Introduction to building thermals</i> - JeanMarie HAUGLUSTAINE | B2 | Q1 | 15 | 15 | - | 3 |
| MECA0034-1 | <i>Rational use of energy in buildings</i> - Vincent LEMORT | B2 | Q1 | 26 | 26 | - | 5 |

ELEN0074-1 *Sensors, microsensors and instrumentation* (english language) - Philippe VANDERBEMDEN - [20h Labo.] B2 Q2 30 - [+] 5

Advanced modeling and simulation

MECA0032-1 (pas organisé en 2018-2019) *Flow in turbomachineries* (english language) - [60h Proj.] B2 TA 26 26 [+] 5

MECA0124-1 *Combustion modelling* - Philippe NGENDAKUMANA B2 Q1 26 26 - 5

MECA0514-1 *Introduction to dynamic modeling of thermal systems* - Sylvain QUOILIN (Odd years) B2 Q1 15 15 - 3

Corequisite :

MECA0006-1 - Machines et systèmes thermiques

MECA0515-1 *Advanced thermal systems* (english language) - Vincent LEMORT (Odd years) B2 Q2 15 15 - 3

Prerequisite :

MECA0006-1 - Machines et systèmes thermiques

MATH0461-2 *Introduction to numerical optimization* (english language) - Quentin LOUVEAUX - [25h Proj.] B2 Q1 30 20 [+] 5

Other optional courses

MECA0018-2 *Manufacturing processes* (english language) - Yves MARCHAL - [15h Labo., 11h Proj., 0,5d FW] B2 Q2 30 - [+] 5

MECA0027-1 *Structural and multidisciplinary optimization* (english language) - Pierre DUYSINX, Patricia TOSSINGS - [18h Proj.] B2 Q1 30 12 [+] 5

PROJ0011-2 *Personal student project* (english language) - Georges DE PELSEMAEKER, Pierre DUYSINX, Liesbet GERIS, Grégoire LÉONARD, Quentin LOUVEAUX - [150h Proj.] B2 TA - - [+] 5

MECA0501-1 *Thermal and Electrical Management of vehicles* (english language) - Vincent LEMORT B2 Q1 15 10 - 3

[...] Choose one course from the course's programme of other master of the Faculty of Applied Sciences (with the approval of the cycle's Jusry president)

Sustainable automotive engineering

Notice : this course list is for students enrolled in Block 1 of the master's degree in 2016-2017, who have already taken the specialised focus in mechanical engineering.

MECA0494-3 *Vehicle components I* (english language) - Olivier BRULS, Pierre DUYSINX B2 Q1 25 15 - 3

Corequisite :

MECA0496-2 - Materials for automotive applications

MECA0493-2 - Vehicle aerodynamics

MECA0492-2 - Vehicle dynamics

MECA0492-2 *Vehicle dynamics* (english language) - Pierre DUYSINX B2 Q1 15 10 - 2

MECA0493-2 *Vehicle aerodynamics* (english language) - Grigorios DIMITRIADIS B2 Q1 15 10 - 2

Corequisite :

MECA0496-2 - Materials for automotive applications

MECA0494-3 - Vehicle components I

MECA0492-2 - Vehicle dynamics

MECA0496-2 *Materials for automotive applications* (english language) - Stoyan GAYDARDZHIEV, Anne MERTENS B2 Q1 15 10 - 2

Corequisite :

MECA0494-3 - Vehicle components I

MECA0493-2 - Vehicle aerodynamics

MECA0492-2 - Vehicle dynamics

MECA0497-2 *Vehicle performance* (english language) - Mustapha BELHABIB, Pierre DUYSINX - [1d FW] B2 Q1 25 15 [+] 3

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|------------|--|----|----|----|----|---|-----|----------|
| | Corequisite : MECA0501-1 - Thermal and Electrical Management of vehicles MECA0500-2 - Hybrid electric and fuel cell vehicles MECA0499-2 - Electric traction motors MECA0498-2 - Internal combustion engines | | | | | | | |
| MECA0498-2 | <i>Internal combustion engines</i> (english language) - Philippe NGENDAKUMANA | B2 | Q1 | 25 | 15 | - | | 3 |
| | Corequisite : MECA0501-1 - Thermal and Electrical Management of vehicles MECA0500-2 - Hybrid electric and fuel cell vehicles MECA0499-2 - Electric traction motors MECA0497-2 - Vehicle performance | | | | | | | |
| MECA0499-2 | <i>Electric traction motors</i> (english language) - Johan GYSELINCK | B2 | Q1 | 15 | 10 | - | | 2 |
| | Corequisite : MECA0501-1 - Thermal and Electrical Management of vehicles MECA0500-2 - Hybrid electric and fuel cell vehicles MECA0498-2 - Internal combustion engines MECA0497-2 - Vehicle performance | | | | | | | |
| MECA0500-4 | <i>Hybrid electric and fuel cell vehicles</i> (english language) - Part A - Pierre DUYSINX, Nathalie JOB - Part B | B2 | Q1 | 25 | 15 | - | | 2 |
| | Corequisite : MECA0501-1 - Thermal and Electrical Management of vehicles MECA0499-2 - Electric traction motors MECA0498-2 - Internal combustion engines MECA0497-2 - Vehicle performance | | | | | | | |
| MECA0501-1 | <i>Thermal and Electrical Management of vehicles</i> (english language) - Vincent LEMORT | B2 | Q1 | 15 | 10 | - | | 3 |
| | Corequisite : MECA0500-2 - Hybrid electric and fuel cell vehicles MECA0499-2 - Electric traction motors MECA0498-2 - Internal combustion engines MECA0497-2 - Vehicle performance | | | | | | | |
| PROJ0013-1 | <i>Innovation project in automotive engineering</i> (english language) - Olivier BRULS, Georges DE PELSEMAEKER, Grigorios DIMITRIADIS, Pierre DUYSINX, Vincent LEMORT - [80h Proj., 1d FW] | B2 | Q1 | 20 | - | | [+] | 8 |

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 | <i>Heat transfer</i> (english language) - Pierre DEWALLEF, Vincent TERRAPON - [4h Labo., 9h Proj.] | B0 | Q2 | 28 | 24 | | [+] | 5 |
| MECA0012-6 | <i>Solid mechanics</i> - Laurent DUCHENE - [15h Proj.] | B0 | Q2 | 26 | 26 | | [+] | 5 |
| ELEC0052-2 | <i>Analysis and Design of Electrical Measuring Systems</i> - Philippe VANDERBEMDEN - [24h Labo.] | B0 | Q1 | 30 | 6 | | [+] | 5 |
| MECA0025-3 | <i>Fluid Mechanics</i> - Eric DELHEZ - [30h Proj.] | B0 | Q2 | 26 | 26 | | [+] | 5 |
| MECA0036-2 | <i>Finite Element Method</i> (english language) - JeanPhilippe PONTHOT - [40h Proj.] | B0 | Q2 | 26 | 26 | | [+] | 5 |
| MECA0155-2 | <i>Dynamics of mechanical systems</i> - JeanClaude GOLINVAL - [5h Labo., 10h Proj.] | B0 | Q1 | 26 | 26 | | [+] | 5 |

| | | | | | | | |
|------------|---|----|----|----|----|-----|----------|
| PHYS0904-4 | <i>Physics of materials</i> - Anne MERTENS - [1d FW] | B0 | Q2 | 26 | 26 | [+] | 5 |
| MATH0006-3 | <i>Introduction to numerical analysis</i> (english language) - Quentin LOUVEAUX | B0 | Q1 | 20 | 20 | - | 4 |
| MECA0001-2 | <i>Mechanics of materials</i> - JeanPierre JASPART - [2h Labo., 12h Proj.] | B0 | Q1 | 27 | 25 | [+] | 5 |
| LANG0039-2 | <i>English 2, English for Engineering</i> (english language) - Christine FILOT, ISLV - [20h Proj.] | B0 | TA | - | 30 | [+] | 3 |
| [...] | Choose maximum 13 credits to complete the curriculum | | | | | | |