Vue cycle du programme des cours

		Bl	Or	Th	Pr	Au	Cr

Depending on your track record or your professional/research focus, some prerequisites/corequisites of your first year program might appear in bloc 2. You are therefore invited to go through the list of courses suggested in bloc 2 even if you enroll for the first time in this master program.

To complete their curriculum, students must earn or validate the 65 credits of the compulsory courses (including the master thesis), choose one option for 25 credits and 30 credits from one of the two professional foci.
Ideally, students enrolling in the master program should have acquired the skills and knowledge corresponding to the 40 credits in "Electrical engineering" offered as part of the bachelor program in engineering.

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

SYST0003-1	*Linear control systems* (anglais) - Guillaume DRION - [6h Labo.]	B1	Q1	30	30	[+]	**5**
INFO0062-1	*Object-oriented programming* (anglais) - Bernard BOIGELOT - [20h Proj.]	B1	Q2	30	24	[+]	**5**
ELEC0055-2	*Electronic control systems* (anglais) - Fabrice FREBEL **Corequis :** ELEC0431-2 - Electromagnetic energy conversion	B1	Q1	30	6	-	**3**
INFO0064-2	*Embedded systems* (anglais) - Bernard BOIGELOT	B1	Q1	25	20	-	**3**
ELEN0017-1	*Analysis and Design of Telecommunications Systems* (anglais) - Marc VAN DROOGENBROECK	B1	Q1	30	30	-	**5**
ELEN0037-1	*Microelectronics and IC design* (anglais) - Michael KRAFT - [40h Proj.]	B1	Q2	30	20	[+]	**5**
APRI0007-1	*Major project in electronics (including fundamentals of project management)* (anglais) - Marc BIRON, Bernard BOIGELOT, Guillaume DRION, Fabrice FREBEL, Christophe GEUZAINE - [80h Proj.] **Corequis :** INFO0064-2 - Embedded systems SYST0003-1 - Linear control systems ELEC0055-2 - Electronic control systems ELEC0053-2 - Circuits électriques ELEC0052-2 - Analyse et conception des systèmes de mesures électriques ELEC0431-2 - Electromagnetic energy conversion	B1	TA	20	-	[+]	**9**
GEST3162-1	*Principles of management* (anglais) - Michael GHILISSEN, François PICHAULT, Thierry PIRONET, Didier VAN CAILLIE - Suppl : Fanny FOX	B2	Q1	25	25	-	**5**
ATFE0014-1	*Master thesis* (anglais) - COLLÉGIALITÉ, Marc VAN DROOGENBROECK - [750h Proj.]	B2	TA	-	-	[+]	**25**

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

Choose one of the following options : (B1 : 25Cr)

Signal processing and control 1 (B1 : 25Cr)

Choose 25 crédits from the following : (B1 : 25Cr)

[...] The subjects ELEC0431-2, ELEC0052-2 et ELEC0053-2 are corequisite to some compulsory courses of the master program. They must be taken as a priority, unless they were already taken as part of the bachelor in engineering, or unless the corresponding knowledge and skills have been acquired previously.

ELEN0002-2	*Introduction to audio and video techniques* (anglais) - JeanJacques EMBRECHTS - [8h Labo.] **Corequis :** ELEN0071-1 - Digital Signal Processing	B1	Q1	30	22	[+]	**5**
ELEN0060-2	*Information and coding theory* (anglais) - Louis WEHENKEL - [30h Proj.]	B1	Q2	30	15	[+]	**5**
ELEN0071-1	*Digital Signal Processing* (anglais) - Jacques VERLY - [40h Proj.]	B1	Q2	45	15	[+]	**5**

INFO0012-3	*Computation structures* (anglais) - Pierre WOLPER - [50h Proj.]	B1	Q1	30	25	[+]	**5**
MATH0461-2	*Introduction to numerical optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	B1	Q1	30	20	[+]	**5**

[...] Remark : students who would have taken some of these courses previously in their program must replace them by other courses from the faculty of engineering; this choice must be approved by the President of the cycle's Jury.

Electronic systems and devices 1 (B1 : 25Cr)

Choose 25 credits from the following : (B1 : 25Cr)

[...] The subjects ELEC0431-2, ELEC0052-2 et ELEC0053-2 are corequisite to some compulsory courses of the master program. They must be taken as a priority, unless they were already taken as part of the bachelor in engineering, or unless the corresponding knowledge and skills have been acquired previously.

ELEN0004-1	*Semiconductor devices* (anglais) - Benoît VANDERHEYDEN	B1	Q1	30	30	-	**5**
ELEN0038-1	*Microsystems* (anglais) - Michael KRAFT - [20h Labo., 40h Proj.]	B1	Q2	30	5	[+]	**5**
ELEN0074-1	*Sensors, microsensors and instrumentation* (anglais) - Philippe VANDERBEMDEN - [20h Labo.]	B1	Q2	30	-	[+]	**5**
ELEN0078-2	*Acoustics and electroacoustics* (anglais) - JeanJacques EMBRECHTS - [8h Labo.]	B1	Q2	30	22	[+]	**5**
INFO0012-3	*Computation structures* (anglais) - Pierre WOLPER - [50h Proj.] **Corequis :** INFO0061-3 - Organisation des ordinateurs INFO2009-2 - Introduction à l'informatique	B1	Q1	30	25	[+]	**5**

[...] Remark : students who would have taken some of these courses previously in their program must replace them by other courses from the faculty of engineering; this choice must be approved by the President of the cycle's Jury.

Electric power and energy systems 1 (B1 : 25Cr)

Choose 25 crédits from the following :

[...] The subjects ELEC0431-2, ELEC0052-2 et ELEC0053-2 are corequisite to some compulsory courses of the master program. They must be taken as a priority, unless they were already taken as part of the bachelor in engineering, or unless the corresponding knowledge and skills have been acquired previously.

ELEC0014-3	*Introduction to electric power and energy systems* (anglais) - Thierry VAN CUTSEM - [1j T. t.]	B1	Q1	28	12	[+]	**4**
ELEC0018-1	*Energy market* (anglais) - Damien ERNST	B1	Q2	45	15	-	**5**
ELEC0029-2	*Electric power systems analysis* (anglais) - Thierry VAN CUTSEM - [25h Proj.]	B1	Q2	16	4	[+]	**3**
ELEC0041-1	*Modelling and design of electromagnetic systems* (anglais) - Patrick DULAR, Christophe GEUZAINE	B1	Q2	30	30	-	**5**
MATH0461-2	*Introduction to numerical optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	B1	Q1	30	20	[+]	**5**
ELEC0445-1	*High Voltage Direct Current (HVDC) grids* (anglais) - Patricia ROUSSEAUX **Corequis :** ELEC0014-3 - Introduction to electric power and energy systems	B1	Q2	16	12	-	**3**

[...] Remark : students who would have taken some of these courses previously in their program must replace them by other courses from the faculty of engineering; this choice must be approved by the President of the cycle's Jury.

Choose one of the following foci : (B2 : 30Cr)

Professional focus in Electrical Engineering (B2 : 30Cr)

Carry on the option begun (B2 : 15Cr)

Carry on the option chosen in Bloc 1 (Signal processing and control, Electronic systems and devices, or Electric power and energy systems) for at least 15 ECTS (if no internship is made) or 10 ECTS (if an internship is made), by complementing the compulsory Bloc 2 course from this option with additional courses from the same option.

Thematic optional courses

Signal processing and control 2 (B2 : 15Cr)

Compulsory course

ELEN0062-1	*Introduction to machine learning* (anglais) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B2	Q1	30	5	[+]	**5**

Optional courses

Choose 10 credits from the following list : (B2 : 10Cr)

ELEN0016-2	*Computer vision* (anglais) - Marc VAN DROOGENBROECK - [50h Proj.]	B2	Q1	30	10	[+]	**5**
ELEN0019-2	*Audio signal processing : principles and experiments* (anglais) - JeanJacques EMBRECHTS - [24h Labo., 30h Proj.] **Prérequis :** ELEN0002-2 - Introduction to audio and video techniques	B2	Q1	5	-	[+]	**5**
ELEN0072-1	*Statistical signal processing* (anglais) - Jacques VERLY - [40h Proj.] **Prérequis :** ELEN0071-1 - Digital Signal Processing	B2	Q1	45	15	[+]	**5**
ELEN0074-1	*Sensors, microsensors and instrumentation* (anglais) - Philippe VANDERBEMDEN - [20h Labo.]	B2	Q2	30	-	[+]	**5**
INFO0948-2	*Introduction to intelligent robotics* (anglais) - Renaud DETRY, Louis WEHENKEL - [80h Proj.]	B2	Q2	30	4	[+]	**5**
MATH0462-1	*Discrete optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	B2	Q1	30	20	[+]	**5**
INFO0939-1	*High performance scientific computing* (anglais) - Christophe GEUZAINE - [20h Proj.]	B2	Q1	30	15	[+]	**5**
GBIO0008-2	*Medical imaging* (anglais) - Christophe PHILLIPS - [8h Labo., 1j T. t.]	B2	Q2	33	12	[+]	**5**

[...] Remark : students who would have taken some of these courses previously in their program must replace them by other courses from the faculty of engineering; this choice must be approved by the President of the cycle's Jury.

Electronic systems and devices 2 (B2 : 15Cr)

Compulsory course

ELEN0062-1	*Introduction to machine learning* (anglais) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B2	Q1	30	5	[+]	**5**

Optional courses

Choose 10 credits from the following list : (B2 : 10Cr)

ELEC0017-1	*Electromagnetic Compatibility* (anglais) - Véronique BEAUVOIS, Christophe GEUZAINE - [30h Proj.]	B2	TA	20	10	[+]	**5**
ELEC0041-1	*Modelling and design of electromagnetic systems* (anglais) - Patrick DULAR, Christophe GEUZAINE	B2	Q2	30	30	-	**5**

ELEC0054-1	*Application of electrical measurement systems* (anglais) - Philippe VANDERBEMDEN - [20h Labo.]	B2	Q1	30	10	[+]	**5**
ELEN0069-1	*Nanoelectronics / Optoelectronics* (anglais) - Benoît VANDERHEYDEN - [40h Proj.] **Prérequis :** ELEN0004-1 - Semiconductor devices	B2	Q2	30	-	[+]	**5**
GBIO0029-1	*Bioelectronics* (anglais) - Michael KRAFT - [20h Labo., 20h Proj.]	B2	Q1	30	15	[+]	**5**
MECA0009-2	*Introduction to microtechnology* (anglais) - Tristan GILET - [8h Labo., 22h Proj.]	B2	Q2	12	12	[+]	**5**

[...] Remark : students who would have taken some of these courses previously in their program must replace them by other courses from the faculty of engineering; this choice must be approved by the President of the cycle's Jury.

Electric power and energy systems 2

Compulsory course

MECA0450-3	*Renewable energies* (anglais) - Pierre DEWALLEF - [24h Proj., 1j T. t.]	B2	Q1	24	12	[+]	**5**

Optional courses

Choose 10 credits from the following list : (B2 : 10Cr)

ELEC0436-1	*Electric Energy Management Systems* (anglais) - Patricia ROUSSEAUX - [12h Labo., 20h Proj.] **Prérequis :** ELEC0029-2 - Electric power systems analysis	B2	Q1	20	16	[+]	**5**
ELEC0047-1	*Electric power systems dynamics, control and stability* (anglais) - Thierry VAN CUTSEM - [25h Proj.] **Prérequis :** ELEC0029-2 - Electric power systems analysis	B2	Q1	30	8	[+]	**5**
ELEN0062-1	*Introduction to machine learning* (anglais) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B2	Q1	30	5	[+]	**5**
MATH0462-1	*Discrete optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	B2	Q1	30	20	[+]	**5**
ELEN0445-1	*Microgrids* (anglais) - Bertrand CORNÉLUSSE **Prérequis :** ELEC0014-3 - Introduction to electric power and energy systems	B2	Q1	18	18	-	**3**
CHIM0664-1	*Electrochemical energy conversion and storage* (anglais) - Nathalie JOB - [15h Labo.]	B2	Q1	15	-	[+]	**3**

[...] Remark : students who would have taken some of these courses previously in their program must replace them by other courses from the faculty of engineering; this choice must be approved by the President of the cycle's Jury.

General optional courses (B2 : 15Cr)

Choose 15 credits from the list below : (B2 : 15Cr)

Remarque : the course units ASTG0019-1 and ASTG0026-1 are mutually exclusive.

ASTG0019-1	*Internship (distinct from master's thesis)* (anglais) - Christophe GEUZAINE - [40j T. t.]	B2	TA	-	-	[+]	**10**
ASTG0026-1	*Internship (linked to master's thesis)* (anglais) - COLLÉGIALITÉ, Christophe GEUZAINE - [80j T. t.]	B2	TA	-	-	[+]	**5**
INGE0012-1	*Scientific research in engineering and its impact on innovation* (anglais) - Rodolphe SEPULCHRE	B2	Q2	30	30	-	**5**

[...] One course to choose from the ULg courses programme ; this choice must have the approval of the cycle's jury President

Choose 15 credits from : (B2 : 15Cr)

[...] The remaining credits can then be chosen amongst all the courses listed in the other Thematic optional courses, the internship, (regardless of the option). This choice must be approved by the President of the cycle's Jury. Students who have already taken one or more optional courses found in the list cannot take them again.

[...] or amongst the courses that have not been taken in Bloc 1. This choice must be approved by the President of the cycle's Jury. Students who have already taken one or more optional courses found in the list cannot take them again.

Professional focus in sustainable automotive engineering (B2 : 30Cr)

PROJ0013-1	*Innovation project in automotive engineering* (anglais) - Olivier BRULS, Georges DE PELSEMAEKER, Grigorios DIMITRIADIS, Pierre DUYSINX, Vincent LEMORT - [80h Proj., 1j T. t.] **Corequis :** MECA0492-2 - Vehicle dynamics MECA0497-2 - Vehicle performance	B2	Q1	20	-	[+]	**8**
MECA0492-2	*Vehicle dynamics* (anglais) - Pierre DUYSINX **Corequis :** MECA0496-2 - Materials for automotive applications MECA0494-3 - Vehicle components I MECA0493-2 - Vehicle aerodynamics	B2	Q1	15	10	-	**2**
MECA0493-2	*Vehicle aerodynamics* (anglais) - Grigorios DIMITRIADIS **Corequis :** MECA0496-2 - Materials for automotive applications MECA0494-3 - Vehicle components I MECA0492-2 - Vehicle dynamics	B2	Q1	15	10	-	**2**
MECA0494-3	*Vehicle components I* (anglais) - Olivier BRULS, Pierre DUYSINX **Corequis :** MECA0496-2 - Materials for automotive applications MECA0493-2 - Vehicle aerodynamics MECA0492-2 - Vehicle dynamics	B2	Q1	25	15	-	**3**
MECA0496-2	*Materials for automotive applications* (anglais) **Corequis :** MECA0494-3 - Vehicle components I MECA0493-2 - Vehicle aerodynamics MECA0492-2 - Vehicle dynamics	B2	Q1	15	10	-	**2**
MECA0497-2	*Vehicle performance* (anglais) - Mustapha BELHABIB, Pierre DUYSINX - [1j T. t.] **Corequis :** 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	B2	Q1	25	15	[+]	**3**
MECA0498-2	*Internal combustion engines* (anglais) - Philippe NGENDAKUMANA **Corequis :** 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	B2	Q1	25	15	-	**3**
MECA0499-2	*Electric traction motors* (anglais) - Johan GYSELINCK **Corequis :** MECA0501-1 - Thermal and Electrical Management of vehicles	B2	Q1	15	10	-	**2**

MECA0500-2 - Hybrid electric and fuel cell vehicles
MECA0498-2 - Internal combustion engines
MECA0497-2 - Vehicle performance

MECA0500-2	*Hybrid electric and fuel cell vehicles* (anglais) - Pierre DUYSINX, Nathalie JOB **Corequis :** MECA0501-1 - Thermal and Electrical Management of vehicles MECA0499-2 - Electric traction motors MECA0498-2 - Internal combustion engines MECA0497-2 - Vehicle performance	B2	Q1	25	15	-	**2**
MECA0501-1	*Thermal and Electrical Management of vehicles* (anglais) - Vincent LEMORT **Corequis :** MECA0500-2 - Hybrid electric and fuel cell vehicles MECA0499-2 - Electric traction motors MECA0498-2 - Internal combustion engines MECA0497-2 - Vehicle performance	B2	Q1	15	10	-	**3**

Research focus (B2 : 30Cr)

À destination des étudiants qui ont suivi cette finalité en 2015-2016.

Priority courses

ELEC0431-2	*Electromagnetic energy conversion* (anglais) - Christophe GEUZAINE - [15h Labo.]	B1	Q2	30	15	[+]	**5**
ELEC0052-2	*Analyse et conception des systèmes de mesures électriques* - Philippe VANDERBEMDEN - [24h Labo.]	B1	Q1	30	6	[+]	**5**
ELEC0053-2	*Circuits électriques* - Patricia ROUSSEAUX	B1	Q2	30	30	-	**5**

Crédits supplémentaires Master en Ingénieur Civil Electricien

Optional courses (B0 : 60Cr)

The individual program of each transfer student will be established by the jury on the basis of his/her background.
If some of the prerequisite are not met, this program will contain up to 60 additional credits mainly taken from the list below. Students who do not speak French will never be committed to take subjects/courses that are only taught in French. (B0 : 60Cr)

ELEC0431-2	*Electromagnetic energy conversion* (anglais) - Christophe GEUZAINE - [15h Labo.]	B0	Q2	30	15	[+]	**5**
ELEC0052-2	*Analyse et conception des systèmes de mesures électriques* - Philippe VANDERBEMDEN - [24h Labo.]	B0	Q1	30	6	[+]	**5**
ELEC0053-2	*Circuits électriques* - Patricia ROUSSEAUX	B0	Q2	30	30	-	**5**
ELEN0040-1	*Digital electronics* (anglais) - Michael KRAFT	B0	Q2	30	30	-	**5**
ELEN0076-1	*Electromagnétisme* - Patricia ROUSSEAUX, Benoît VANDERHEYDEN	B0	Q1	30	30	-	**5**
ELEN0008-1	*Principes des télécommunications analogiques et numériques* - Marc VAN DROOGENBROECK	B0	Q2	30	30	-	**5**
ELEN0075-3	*Electronique analogique* - Benoît VANDERHEYDEN - [16h Labo.]	B0	Q2	30	24	[+]	**5**
ELEN0070-2	*Signal processing* (anglais) - Jacques VERLY - [40h Proj.]	B0	Q2	45	15	[+]	**5**

[...] Choisir maximum 20 crédits pour compléter le cursus