Block view of the study programme

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Block 1

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 50 credits of the compulsory courses (including the master thesis), choose one of the three professional foci (30 credits), choose three courses in the list of transversal methodology courses (for 15 credits), and choose optional courses for 25 credits.
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

ELEN0448-1	*Applied Electricity and Electronics* (english language) - JeanMichel REDOUTÉ, Philippe VANDERBEMDEN	Q1	26	26	-	**5**
INFO0064-2	*Embedded systems* (english language) - Bernard BOIGELOT **Corequisite :** APRI0007-1 - Major project in electrical engineering	Q1	25	20	-	**3**
ELEC0055-2	*Element of power Electronics, Part A* (english language) - Fabrice FREBEL **Corequisite :** ELEC0431-2 - Electromagnetic energy conversion	Q1	30	6	-	**3**
APRI0007-1	*Major project in electrical engineering* (english language) - Marc BIRON, Bernard BOIGELOT, Guillaume DRION, JeanMichel REDOUTÉ - [300h Proj.] **Corequisite :** ELEC0055-2 - Element of power Electronics ELEC0053-2 - Circuits électriques ELEC0052-2 - Mesures électriques : fondements et applications ELEC0431-2 - Electromagnetic energy conversion INFO0064-2 - Embedded systems	TA	20	-	[+]	**9**

Elective courses

Choose one of the three following foci:

Professional focus : Electronic systems and devices

[...] 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.

ELEN0004-1	*Semiconductor devices* (english language) - Benoît VANDERHEYDEN	Q1	26	26	-	**5**
ELEN0037-1	*Microelectronics and IC design* (english language) - JeanMichel REDOUTÉ - [40h Proj.]	Q2	30	20	[+]	**5**
ELEN0074-1	*Sensors, microsensors and instrumentation* (english language) - Philippe VANDERBEMDEN - [20h Labo.]	Q2	30	-	[+]	**5**
SYST0020-1	*Introduction to microsystems and microtechnology* (english language) - Tristan GILET, JeanMichel REDOUTÉ - [4h Labo., 20h Proj.]	Q2	24	18	[+]	**5**
ELEN0017-1	*Analysis and Design of Telecommunications Systems* (english language) - Marc VAN DROOGENBROECK	Q1	26	26	-	**5**

Professional focus: Smart Grids

Focus accessible only to students enrolled before the 2023-2024 academic year.

[...] 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.

ELEC0018-1	*Energy market and regulation* (english language) - Damien ERNST	Q1	39	13	-	**5**

ELEC0041-1	*Modelling and design of electromagnetic systems* (english language) - Christophe GEUZAINE	Q2	26	26	-	**5**
MECA0450-3	*Renewable Energy System Design* (english language) - Pierre DEWALLEF - [24h Proj., 1d FW]	Q1	24	12	[+]	**5**
ELEC0447-1	*Analysis of electric power and energy systems* (english language) - Bertrand CORNÉLUSSE, Louis WEHENKEL - [1d FW] **Corequisite :** ELEC0053-2 - Circuits électriques	Q1	26	26	[+]	**5**
ELEC0448-1	*Planning and operation of electric power and energy systems* (english language) - Bertrand CORNÉLUSSE, Damien ERNST, Louis WEHENKEL **Corequisite :** ELEC0447-1 - Analysis of electric power and energy systems MATH0461-2 - Introduction to numerical optimization	Q2	26	26	-	**5**

Professional focus : Signal processing and intelligent robotics

Notice : only accessible to students already registered for this focus.

[...] 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.

SYST0017-1	*Advanced topics in systems and control* (english language) - Pierre DAUBY, Guillaume DRION	Q1	26	26	-	**5**
ELEN0060-2	*Information and coding theory* (english language) - Louis WEHENKEL - [30h Proj.]	Q2	30	15	[+]	**5**
INFO0948-2	*Introduction to intelligent robotics* (english language) - Pierre SACRÉ - [80h Proj.]	Q2	30	4	[+]	**5**
INFO8003-1	*Optimal decision making for complex problems* (english language) - Damien ERNST - [45h Proj.]	Q2	25	10	[+]	**5**
INFO8010-1	*Deep learning* (english language) - Gilles LOUPPE - [60h Proj.] **Corequisite :** ELEN0062-1 - Introduction to machine learning	Q2	30	-	[+]	**5**

Professional focus: Neuromorphic engineering

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

SYST0017-1	*Advanced topics in systems and control* (english language) - Pierre DAUBY, Guillaume DRION	Q1	26	26	-	**5**
INFO0948-2	*Introduction to intelligent robotics* (english language) - Pierre SACRÉ - [80h Proj.]	Q2	30	4	[+]	**5**
GNEU0001-1	*Principles of Neuroengineering* (english language) - Guillaume DRION, Alessio FRANCI, Christophe PHILLIPS, Pierre SACRÉ - [26h Labo., 15h Proj.]	Q1	26	-	[+]	**5**
GNEU0002-1	*Brain Inspired Computing* (english language) - Alessio FRANCI - [20h Proj.]	Q2	25	20	[+]	**5**
GNEU0003-1	*Neuromorphic Signal Processing* (english language) - Alessio FRANCI - [20h Proj.]	Q2	25	20	[+]	**5**

Professional focus : Electric power and energy systems

Notice : only accessible to students already registered for this focus.

Choose three among the following transversal courses that can be spread over the 2 blocks

Transversal courses

ELEN0060-2	*Information and coding theory* (english language) - Louis WEHENKEL - [30h Proj.]	Q2	30	15	[+]	**5**
INFO8003-1	*Optimal decision making for complex problems* (english language) - Damien ERNST - [45h Proj.]	Q2	25	10	[+]	**5**
ELEN0062-1	*Introduction to machine learning* (english language) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	Q1	30	5	[+]	**5**
INFO0062-1	*Object-oriented programming* (english language) - Bernard BOIGELOT - [20h Proj.]	Q2	25	20	[+]	**5**
INFO0939-1	*High performance scientific computing* (english language) - Christophe GEUZAINE - [20h Proj.]	Q1	30	15	[+]	**5**
MATH0461-2	*Introduction to numerical optimization* (english language) - Quentin LOUVEAUX - [25h Proj.]	Q1	30	20	[+]	**5**
MATH0462-1	*Discrete optimization* (english language) - Quentin LOUVEAUX - [25h Proj.]	Q2	30	20	[+]	**5**

Block 2

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.

Compulsory Courses

GEST3162-1	*Principles of management* (english language) - François PICHAULT, Willem STANDAERT - [25h Proj.]	Q1	30	-	[+]	**5**
ATFE0014-1	*Master Thesis* (english language) - COLLÉGIALITÉ, Bertrand CORNÉLUSSE - [750h Proj.]	TA	-	-	[+]	**25**

Elective courses

Carry on the focus begun :

Professional focus : Electronic systems and devices

GBIO0029-1	*Bioelectronics* (english language) - JeanMichel REDOUTÉ - [20h Labo., 20h Proj.]	Q1	30	15	[+]	**5**

Professional focus: Smart Grids

ELEN0445-1	*Microgrids* (english language) - Bertrand CORNÉLUSSE - [24h Proj., 1d FW]	Q1	18	18	[+]	**5**

Professional focus : Signal processing and intelligent robotics

ELEN0016-2	*Computer vision* (english language) - Marc VAN DROOGENBROECK - [50h Proj.]	Q1	30	10	[+]	**5**

Professional focus: Neuromorphic engineering

ELEN0016-2	*Computer vision* (english language) - Marc VAN DROOGENBROECK - [50h Proj.]	Q1	30	10	[+]	**5**

Professional focus : Electric power and energy systems

Complete your programme with 25 credits chosen among any of the courses listed above (that are not already part of your programme) or in the list below (this choice must be approved by the President of the cycle's Jury).

Remark : the course units ASTG0019-1 et ASTG0026-1 are mutually exclusive.

ASTG0019-1	*Internship (distinct from master's thesis)* (english language) - Bertrand CORNÉLUSSE - [40d FW]	TA	-	-	[+]	**10**
ASTG0026-1	*Internship (linked to master's thesis)* (english language) - COLLÉGIALITÉ, Bertrand CORNÉLUSSE - [80d FW]	TA	-	-	[+]	**2**

Smart grids

ELEC0449-1	*Practices and evolution of the electric power and energy industry* (english language) - Bertrand CORNÉLUSSE, Damien ERNST, Louis WEHENKEL - [12h Proj., 6d FW] **Prerequisite :** ELEC0447-1 - Analysis of electric power and energy systems ELEC0018-1 - Energy market and regulation	TA	-	-	[+]	**5**
CHIM0664-1	*Electrochemical energy conversion and storage* (english language) - *theory* - Nathalie JOB - *lab* - Nathalie JOB - [15h Labo.]	Q1	15 -	- -	- [+]	**3**

Electronic systems and devices

ELEN0447-1	*High-frequency electronics* (english language) - JeanMichel REDOUTÉ, Benoît VANDERHEYDEN - [10h Labo.]	Q1	26	12	[+]	**5**
ELEC0054-1	*Advanced electrical measurement systems* (english language) - Philippe VANDERBEMDEN - [20h Labo.]	Q1	30	10	[+]	**5**
ELEN0069-1	*Nanoelectronics / Optoelectronics* (english language) - Benoît VANDERHEYDEN - [40h Proj.] **Corequisite :** ELEN0004-1 - Semiconductor devices	Q2	30	-	[+]	**5**

Neuromorphic engineering

GBIO0008-2	*Medical imaging* (english language) - Christophe PHILLIPS - [8h Labo., 1d FW]	Q2	33	12	[+]	**5**
INFO8004-1	*Advanced Machine learning* (english language) - Pierre GEURTS, Gilles LOUPPE, Louis WEHENKEL - [20h Proj.] **Corequisite :** ELEN0062-1 - Introduction to machine learning INFO8010-1 - Deep learning	Q2	25	-	[+]	**5**
INFO8006-1	*Introduction to artificial intelligence* (english language) - Gilles LOUPPE - [45h Proj.]	Q1	25	20	[+]	**5**
INFO8010-1	*Deep learning* (english language) - Gilles LOUPPE - [60h Proj.]	Q2	30	-	[+]	**5**
GNEU0004-1	*Computational cognitive modelling* (english language) - Alessio FRANCI	Q1	26	26	-	**5**

[...] Possibility to choose 10 credits of courses in the ULIège programmes or from the UNIC course catalog : this choice must have the approval of the cycle's juryPresident

Bloc d'aménagement du programme de l'année

Additional ECTS Master in electrical engineering

Optional courses

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.

ELEC0431-2	*Electromagnetic energy conversion* (english language) - Christophe GEUZAINE - [15h Labo.]	Q2	30	15	[+]	**5**
ELEC0052-2	*Electric measurements: foundations and applications* - Philippe VANDERBEMDEN - [24h Labo.]	Q1	30	6	[+]	**5**
ELEC0053-2	*Electric circuits* - Bertrand CORNÉLUSSE	Q2	26	26	-	**5**
ELEN0040-1	*Digital electronics* (english language) - JeanMichel REDOUTÉ	Q2	26	26	-	**5**
ELEN0076-1	*Electromagnetism* - Benoît VANDERHEYDEN	Q1	26	26	-	**5**

ELEN0008-1	*Principles of analog and digital telecommunications systems* - Marc VAN DROOGENBROECK	Q2	26	26	-	**5**
ELEN0075-3	*Analog Electronics* - Benoît VANDERHEYDEN - [16h Labo.]	Q2	29	23	[+]	**5**

[...] Choose maximum 25 credits to complete the study programme