

**Bloc 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.

**Focus courses**

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

**Compulsory courses from the core curriculum**

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

**Optional courses from the core curriculum**

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

**Transversal courses**

|            |   |    |    |    |     |   |
|------------|---|----|----|----|-----|---|
| ELEN0060-2 | <i>Information and coding theory</i> (anglais) - Louis WEHENKEL - [30h Proj.]                   | Q2 | 30 | 15 | [+] | 5 |
| INFO8003-1 | <i>Reinforcement learning</i> (anglais) - Damien ERNST - [45h Proj.]                            | Q2 | 25 | 10 | [+] | 5 |
| ELEN0062-1 | <i>Introduction to machine learning</i> (anglais) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.] | Q1 | 30 | 5  | [+] | 5 |
| INFO0062-1 | <i>Object-oriented programming</i> (anglais) - Bernard BOIGELOT - [20h Proj.]                   | Q2 | 25 | 20 | [+] | 5 |
| INFO0939-1 | <i>High performance scientific computing</i> (anglais) - Christophe GEUZAINÉ - [20h Proj.]      | Q1 | 30 | 15 | [+] | 5 |

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

MATH0462-1 *Discrete optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.] Q2 30 20 [+] 5

**Bloc 2**

**Focus courses**

ELEN0447-1 *High-frequency electronics* (anglais) - JeanMichel REDOUTÉ, Benoît VANDERHEYDEN - [10h Labo.] Q1 26 12 [+] 5

**Compulsory courses from the core curriculum**

GEST3162-1 *Principles of management* (anglais) - Michaël PARMENTIER - [25h Proj.] Q1 30 - [+] 5

ATFE0014-1 *Master thesis* (anglais) - COLLÉGIALITÉ, Marc VAN DROOGENBROECK - [750h Proj.] TA - - [+] 25

**Optional courses from the core curriculum**

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)* (anglais) - JeanMichel REDOUTÉ - [40j T. t.] TA - - [+] 10

ASTG0026-1 *Internship (linked to master's thesis)* (anglais) - COLLÉGIALITÉ, Marc VAN DROOGENBROECK - [80j T. t.] TA - - [+] 2

**Smart grids**

ELEC0449-1 *Practices and evolution of the electric power and energy industry* (anglais) - Bertrand CORNÉLUSSE, Damien ERNST, Louis WEHENKEL - [12h Proj., 6j T. t.] TA - - [+] 5

**Prérequis :**

ELEC0447-1 - Analysis of electric power and energy systems

ELEC0018-1 - Energy markets and regulation

CHIM0664-1 *Electrochemical energy conversion and storage* (anglais) - *partim 1* - Nathalie JOB - [15h Labo.] Q1 15 - - 3  
- *partim 2* - Nathalie JOB - [15h Labo.] - - [+]

**Electronic systems and devices**

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

ELEN0069-1 *Nanoelectronics / Optoelectronics* (anglais) - Benoît VANDERHEYDEN - [40h Proj.] Q2 30 - [+] 5

**Corequis :**

ELEN0004-1 - Semiconductor devices

ELEN0445-1 *Microgrids* (anglais) - Bertrand CORNÉLUSSE - [24h Proj., 1j T. t.] Q1 18 18 [+] 5

ELEN0047-1 *Superconductivity* (anglais) - Philippe VANDERBEMDEN - [15h Labo.] Q1 30 - [+] 5

**Neuromorphic engineering**

GBIO0008-2 *Medical imaging* (anglais) - Christophe PHILLIPS - [8h Labo., 1j T. t.] Q2 33 12 [+] 5

INFO8004-1 *Advanced Machine learning* (anglais) - Pierre GEURTS, Gilles LOUPPE, Louis WEHENKEL - [20h Proj.] Q2 25 - [+] 5

**Corequis :**

INFO8010-1 - Deep learning

ELEN0062-1 - Introduction to machine learning

INFO8006-1 *Introduction to artificial intelligence* (anglais) - Gilles LOUPPE - [45h Proj.] Q1 25 20 [+] 5

INFO8010-1 *Deep learning* (anglais) - Gilles LOUPPE - [60h Proj.] Q2 30 - [+] 5

GNEU0004-1 *Computational cognitive modelling* (anglais) - 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**

**Crédits supplémentaires Master en Ingénieur Civil Electricien**

**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 | <i>Electromagnetic energy conversion</i> (anglais) - Christophe GEUZAINÉ - [15h Labo.]        | Q2 | 30 | 15 | [+] | 5 |
| ELEC0052-2 | <i>Mesures électriques : fondements et applications</i> - Philippe VANDERBEMDEN - [24h Labo.] | Q1 | 30 | 6  | [+] | 5 |
| ELEC0053-2 | <i>Circuits électriques</i> - Bertrand CORNÉLUSSE   | Q2 | 26 | 26 | -   | 5 |
| ELEN0040-1 | <i>Digital electronics</i> (anglais) - JeanMichel REDOUTÉ                                     | Q2 | 26 | 26 | -   | 5 |
| ELEN0076-1 | <i>Electromagnétisme</i> - Benoît VANDERHEYDEN  | Q1 | 26 | 26 | -   | 5 |
| ELEN0008-1 | <i>Principes des télécommunications analogiques et numériques</i> - Marc VAN DROOGENBROECK    | Q2 | 26 | 26 | -   | 5 |
| ELEN0075-3 | <i>Electronique analogique</i> - Benoît VANDERHEYDEN - [16h Labo.]                            | Q2 | 29 | 23 | [+] | 5 |

[...] Choisir maximum 25 crédits pour compléter le cursus