

#### 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 all the 50 credits of the compulsory courses (including the master thesis), 30 credits from of the professional focus, 15 credits from the list of transversal methodology courses, and 25 credits of other optional courses.

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.

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

#### Compulsory courses from the core curriculum

ELEN0448-1	<i>Applied Electricity and Electronics</i> (english language) - JeanMichel REDOUTÉ, Philippe VANDERBEMDEN	Q1	26	26	-	5
INFO0064-2	<i>Embedded systems</i> (english language) - Bernard BOIGELOT <b>Corequisite :</b> APRI0007-1 - Major project in electrical engineering	Q1	25	20	-	3
ELEC0055-2	<i>Element of power Electronics, Part A</i> (english language) - Fabrice FREBEL <b>Corequisite :</b> ELEC0431-2 - Electromagnetic energy conversion	Q1	30	6	-	3
APRI0007-1	<i>Major project in electrical engineering</i> (english language) - Marc BIRON, Bernard BOIGELOT, Guillaume DRION, JeanMichel REDOUTÉ - [300h Proj.] <b>Corequisite :</b> ELEC0431-2 - Electromagnetic energy conversion ELEC0052-2 - Mesures électriques : fondements et applications ELEC0053-2 - Circuits électriques ELEC0055-2 - Element of power Electronics 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> (english language) - Louis WEHENKEL - [30h Proj.]	Q2	30	15	[+]	5
INFO8003-1	<i>Reinforcement learning</i> (english language) - Damien ERNST - [45h Proj.]	Q2	25	10	[+]	5
ELEN0062-1	<i>Introduction to machine learning</i> (english language) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	Q1	30	5	[+]	5
INFO0062-1	<i>Object-oriented programming</i> (english language) - Bernard BOIGELOT - [20h Proj.]	Q2	25	20	[+]	5

INFO0939-1	<i>High performance scientific computing</i> (english language) - Christophe GEUZAINÉ - [20h Proj.]	Q1	30	15	[+]	5
MATH0461-2	<i>Introduction to numerical optimization</i> (english language) - Quentin LOUVEAUX - [25h Proj.]	Q1	30	20	[+]	5
MATH0462-1	<i>Discrete optimization</i> (english language) - Quentin LOUVEAUX - [25h Proj.]	Q2	30	20	[+]	5

#### Block 2

##### Focus courses

ELEN0016-2	<i>Computer vision</i> (english language) - Anthony CIOPPA, Marc VAN DROOGENBROECK - [50h Proj.]	Q1	30	10	[+]	5
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##### Compulsory courses from the core curriculum

GEST3162-1	<i>Principles of management</i> (english language) - Thomas PIRSOU, Willem STANDAERT - [25h Proj.]	Q1	30	-	[+]	5
ATFE0014-1	<i>Master Thesis</i> (english language) - 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 courses ELEC0431-2, ELEC0052-2 et ELEC0053-2 (see the list "Fundamentals of Electrical Engineering" are corequisite to some compulsory courses of the master program. They must be taken prioritarily, unless they were already taken as part of the bachelor in engineering, or unless the corresponding knowledge and skills have been acquired previously.

##### Fundamentals of Electrical Engineering

ELEC0431-2	<i>Electromagnetic energy conversion</i> (english language) - Christophe GEUZAINÉ - [15h Labo.]	Q2	30	15	[+]	5
ELEC0052-2	<i>Electric measurements: foundations and applications</i> - Philippe VANDERBEMDEN - [24h Labo.]	Q1	30	6	[+]	5
ELEC0053-2	<i>Electric circuits</i> - Bertrand CORNÉLUSSE	Q2	26	26	-	5

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

ASTG0019-1	<i>Internship (distinct from master's thesis)</i> (english language) - JeanMichel REDOUTÉ - [40d FW]	TA	-	-	[+]	10
ASTG0026-1	<i>Internship (linked to master's thesis)</i> (english language) - COLLÉGIALITÉ, Marc VAN DROOGENBROECK - [80d FW]	TA	-	-	[+]	2

##### Smart grids

ELEC0449-1	<i>Practices and evolution of the electric power and energy industry</i> (english language) - Bertrand CORNÉLUSSE, Damien ERNST, Louis WEHENKEL - [12h Proj., 6d FW]	TA	-	-	[+]	5
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##### Prerequisite :

ELEC0447-1 - Analysis of electric power and energy systems  
ELEC0018-1 - Energy markets and regulation

CHIM0664-1	<i>Electrochemical energy conversion and storage</i> (english language) - part 1 - Nathalie JOB	Q1	15	-	-	3
	- part 2 - Nathalie JOB - [15h Labo.]		-	-	[+]	

##### Electronic systems and devices

GBIO0029-1	<i>Bioelectronics</i> (english language) - JeanMichel REDOUTÉ - [20h Labo., 20h Proj.]	Q1	30	15	[+]	5
ELEN0069-1	<i>Nanoelectronics / Optoelectronics</i> (english language) -	Q2	30	-	[+]	5

ANDERHEYDEN - [40h Proj.]

**Corequisite :**

ELEN0004-1 - Semiconductor devices

ELEN0445-1	<i>Microgrids</i> (english language) - Bertrand CORNÉLUSSE - [24h Proj., 1d FW]	Q1	18	18	[+]	5
ELEN0047-1	<i>Superconductivity</i> (english language) - Philippe VANDERBEMDEN - [15h Labo.]	Q1	30	-	[+]	5

**Neuromorphic engineering**

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

*Notice :* 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.

**Optional courses**

[...] Choose 1 to 30 credits from :

ELEC0431-2	<i>Electromagnetic energy conversion</i> (english language) - Christophe GEUZAINÉ - [15h Labo.]	Q2	30	15	[+]	5
ELEC0052-2	<i>Electric measurements: foundations and applications</i> - Philippe VANDERBEMDEN - [24h Labo.]	Q1	30	6	[+]	5
ELEC0053-2	<i>Electric circuits</i> - Bertrand CORNÉLUSSE	Q2	26	26	-	5
ELEN0040-1	<i>Digital electronics</i> (english language) - JeanMichel REDOUTÉ	Q2	26	26	-	5
ELEN0076-1	<i>Electromagnetism</i> - Benoît VANDERHEYDEN	Q1	26	26	-	5
ELEN0008-1	<i>Principles of analog and digital telecommunications systems</i> - Marc VAN DROOGENBROECK	Q2	26	26	-	5
ELEN0075-3	<i>Analog Electronics</i> - Benoît VANDERHEYDEN - [16h Labo.]	Q2	29	23	[+]	5

[...] Choose a maximum of 25 off-list credits

## Additional ECTS Master in electrical engineering

### Master Msc. in Electrical Engineering, professional focus in Neuromorphic Engineering

*Notice* : 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.

#### Optional courses

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

ELEC0431-2	<i>Electromagnetic energy conversion (english language) -</i> Christophe GEUZAINÉ - [15h Labo.]	Q2	30	15	[+]	5
ELEC0052-2	<i>Electric measurements: foundations and applications -</i> Philippe VANDERBEMDEN - [24h Labo.]	Q1	30	6	[+]	5
ELEC0053-2	<i>Electric circuits -</i> Bertrand CORNÉLUSSE	Q2	26	26	-	5
ELEN0040-1	<i>Digital electronics (english language) -</i> JeanMichel REDOUTÉ	Q2	26	26	-	5
ELEN0076-1	<i>Electromagnetism -</i> Benoît VANDERHEYDEN	Q1	26	26	-	5
ELEN0008-1	<i>Principles of analog and digital telecommunications systems -</i> Marc VAN DROOGENBROECK	Q2	26	26	-	5
ELEN0075-3	<i>Analog Electronics -</i> Benoît VANDERHEYDEN - [16h Labo.]	Q2	29	23	[+]	5

[...] Choose a maximum of 25 off-list credits

#### Bridging courses M. electro-mech. engineer. (gen.)

ELEC0431-2	<i>Electromagnetic energy conversion (english language) -</i> Christophe GEUZAINÉ - [15h Labo.]	Q2	30	15	[+]	5
ELEC0052-2	<i>Electric measurements: foundations and applications -</i> Philippe VANDERBEMDEN - [24h Labo.]	Q1	30	6	[+]	5
ELEC0053-2	<i>Electric circuits -</i> Bertrand CORNÉLUSSE	Q2	26	26	-	5
ELEN0040-1	<i>Digital electronics (english language) -</i> JeanMichel REDOUTÉ	Q2	26	26	-	5
ELEN0076-1	<i>Electromagnetism -</i> Benoît VANDERHEYDEN	Q1	26	26	-	5
ELEN0008-1	<i>Principles of analog and digital telecommunications systems -</i> Marc VAN DROOGENBROECK	Q2	26	26	-	5
ELEN0075-3	<i>Analog Electronics -</i> Benoît VANDERHEYDEN - [16h Labo.]	Q2	29	23	[+]	5