Cycle view of the study programme

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 (B1 : 20Cr, B2 : 30Cr)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Language</th>
<th>B1</th>
<th>Or</th>
<th>Th</th>
<th>Pr</th>
<th>Au</th>
<th>Cr</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYST003-2</td>
<td>Linear control systems (english language)</td>
<td>- Theory - Guillaume DRION</td>
<td>26</td>
<td>6</td>
<td>-</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>INFO0064-2</td>
<td>Embedded systems (english language) - Bernard BOIGELOT</td>
<td>Corequisite: APRI0007-1 - Major project in electronics (including fundamentals of project management)</td>
<td>25</td>
<td>20</td>
<td>-</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ELEC0055-2</td>
<td>Element of power Electronics , Part A (english language)</td>
<td>Corequisite: ELEC0431-2 - Electromagnetic energy conversion</td>
<td>30</td>
<td>6</td>
<td>-</td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>APRI0007-1</td>
<td>Major project in electronics (including fundamentals of project management)</td>
<td>Corequisite: SYST003-2 - Linear control systems</td>
<td>B1 TA</td>
<td>20</td>
<td>-</td>
<td></td>
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<td>11</td>
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</tbody>
</table>

Elective courses (B1 : 40Cr, B2 : 30Cr)

Choose one of the three following foci: (B1 : 25Cr, B2 : 5Cr)

Professional focus : Electric power and energy systems (B1 : 25Cr, B2 : 5Cr)

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.

ULiège : Students and Studies Administration - Academic Affairs
Contact : Monique Marcourt, General Director for Education and Training
Date of data : 01/10/2020 - Page 1 / 4
Professional focus : Electronic systems and devices (B1 : 25Cr, B2 : 5Cr)

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  
B1  Q1  26  26  -  5

ELEN0037-1  *Microelectronics and IC design* (english language) - JeanMichel REDOUTE - [40h Proj.]  
B1  Q2  30  20  [+ ]  5

ELEN0074-1  *Sensors, microsensors and instrumentation* (english language) - Philippe VANDERBEMDEN - [20h Labo.]  
B1  Q2  30  -  [+ ]  5

SYST0020-1  *Introduction to microsystems and microtechnology* (english language) - Tristan GILET, JeanMichel REDOUTE - [4h Labo., 20h Proj.]  
B1  Q2  24  18  [+ ]  5

ELEN0017-1  *Analysis and Design of Telecommunications Systems* (english language) - Marc VAN DROOGENBROECK  
B1  Q1  26  26  -  5

ELEN0078-2  *Acoustics and electroacoustics* (english language) - JeanJacques EMBRECHTS - [8h Labo.]  
B2  Q1  30  22  [+ ]  5

Professional focus : Signal processing and intelligent robotics (B1 : 25Cr, B2 : 5Cr)

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.

ELEN0002-2  *Introduction to audio and video techniques* (english language) - JeanJacques EMBRECHTS - [8h Labo.]  
Corequisite : ELEN0071-1 - Applied digital signal processing  
B1  Q1  30  22  [+ ]  5

ELEN0060-2  *Information and coding theory* (english language) - Louis WEHENKEL - [30h Proj.]  
B1  Q2  30  15  [+ ]  5

INFO0948-2  *Introduction to intelligent robotics* (english language) - Pierre SACRÉ - [80h Proj.]  
B1  Q2  30  4  [+ ]  5

INFO8010-1  *Deep learning* (english language) - Gilles LOUPPE - [55h Proj.]  
Corequisite : ELEN0062-1 - Introduction to machine learning  
MATH0461-2 - Introduction to numerical optimization  
B1  Q2  25  10  [+ ]  5

INFO8003-1  *Optimal decision making for complex problems* (english language) - Damien ERNST - [45h Proj.]  
B1  Q2  25  10  [+ ]  5

ELEN0016-2  *Computer vision* (english language) - Marc VAN DROOGENBROECK - [50h Proj.]  
B2  Q1  30  10  [+ ]  5

Choose three among the following transversal courses (B1 : 15Cr)

Transversal courses

ELEN0062-1  *Introduction to machine learning* (english language) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]  
B1  Q1  30  5  [+ ]  5

INFO0062-1  *Object-oriented programming* (english language) - Bernard BOIGELOT - [20h Proj.]  
B1  Q2  25  20  [+ ]  5

INFO0939-1  *High performance scientific computing* (english language) - Christophe GEUZAIN - [20h Proj.]  
B1  Q1  30  15  [+ ]  5
### Study programmes 2020-2021

**Faculty of Applied Sciences**

**Master of Science (MSc) in Electrical Engineering**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH0461-2</td>
<td>Introduction to numerical optimization</td>
<td>B1 Q1 30 20 [+ 5]</td>
<td></td>
</tr>
<tr>
<td>MATH0462-1</td>
<td>Discrete optimization</td>
<td>B1 Q2 30 20 [+ 5]</td>
<td></td>
</tr>
</tbody>
</table>

**Fundamentals of Electrical Engineering**

- The subjects ELEC0431-2, ELEC0052-2 and 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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC0431-2</td>
<td>Electromagnetic energy conversion</td>
<td>B1 Q2 30 15 [+ 5]</td>
<td></td>
</tr>
<tr>
<td>ELEC0053-2</td>
<td>Electric circuits</td>
<td>B1 Q2 26 26 - 5</td>
<td></td>
</tr>
</tbody>
</table>

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). (B2 : 25Cr)

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTG0019-1</td>
<td>Internship (distinct from master's thesis)</td>
<td>B2 TA - - [+ 10]</td>
<td></td>
</tr>
<tr>
<td>ASTG0026-1</td>
<td>Internship (linked to master's thesis)</td>
<td>B2 TA - - [+ 2]</td>
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</tbody>
</table>

**Electric power and energy systems**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC0449-1</td>
<td>Practices and evolution of the electric power and energy industry</td>
<td>B2 TA - - [+ 5]</td>
<td></td>
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<tr>
<td>CHIM0664-1</td>
<td>Electrochemical energy conversion and storage</td>
<td>B2 Q1 15 - [+ 3]</td>
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</tbody>
</table>

**Electronic systems and devices**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC0054-1</td>
<td>Application of electrical measurement systems</td>
<td>B2 Q1 30 10 [+ 5]</td>
<td></td>
</tr>
<tr>
<td>ELEN0069-1</td>
<td>Nanoelectronics / Optoelectronics</td>
<td>B2 Q2 30 - [+ 5]</td>
<td></td>
</tr>
<tr>
<td>GBIO0029-1</td>
<td>Bioelectronics</td>
<td>B2 Q1 30 15 [+ 5]</td>
<td></td>
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</tbody>
</table>

**Signal processing and intelligent robotics**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>GBIO0008-2</td>
<td>Medical imaging</td>
<td>B2 Q2 33 12 [+ 5]</td>
<td></td>
</tr>
<tr>
<td>INFO8004-1</td>
<td>Advanced Machine learning</td>
<td>B2 Q2 25 - [+ 5]</td>
<td></td>
</tr>
<tr>
<td>INFO8006-1</td>
<td>Introduction to artificial intelligence</td>
<td>B2 Q1 25 20 [+ 5]</td>
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</tbody>
</table>

**Computer systems and networks**
INFO0012-2 Computation structures (english language) - Pascal FONTAINE, Laurent MATHY - [40h Proj.]

INFO0010-4 Introduction to computer networking (english language) - Guy LEDUC - [12h Labo., 40h Proj.]

Prerequisite:
INFO0062-1 - Object-oriented programming

Other elective courses

INGLE0012-1 Scientific research in engineering and its impact on innovation (english language) - Rodolphe SEPULCHRE

Prerequisite:
INFO0062-1 - Object-oriented programming

Additional ECTS Master in electrical engineering

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 (english language) - Christophe GEUZAIN - [15h Labo.]

ELEC0052-2 Analysis and Design of Electrical Measuring Systems - Philippe VANDERBEMDEN - [24h Labo.]

ELEC0053-2 Electric circuits - Bertrand CORNELUSSE

ELEN0040-1 Digital electronics (english language) - JeanMichel REDOUTÉ

ELEN0076-1 Electromagnetism - Benoît VANDERHEYDEN

ELEN0008-1 Principles of analog and digital telecommunications systems - Marc VAN DROOGENBROECK

ELEN0075-3 Analog Electronics - Benoît VANDERHEYDEN - [16h Labo.]

Choose maximum 25 credits to complete the study programme