Block view of the study programme

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 70 credits of the compulsory courses (including the master thesis), choose one option for 20 credits and 30 credits from one of the three professional foci.

Ideally, students enrolling in the master program should have acquired the skills and knowledge corresponding to the 40 credits in "Computer science" offered as part of the bachelor program in engineering.

Compulsory Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Credits</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFO0085-1</td>
<td>Compilers (english language) - Pierre Geurts</td>
<td>- [75h Proj.]</td>
<td>Q2 25</td>
<td>+   5</td>
</tr>
<tr>
<td>INFO0063-1</td>
<td>Object-oriented software engineering (english language) - Bernard Boigelot</td>
<td>- [30h Proj.]</td>
<td>Q1 30</td>
<td>+   5</td>
</tr>
<tr>
<td>INFO0016-1</td>
<td>Introduction to the theory of computation (english language) - Pierre Wolfer</td>
<td></td>
<td>Q1 30</td>
<td>-   5</td>
</tr>
<tr>
<td>MATH0462-1</td>
<td>Discrete optimization (english language) - Quentin Louveaux</td>
<td>- [25h Proj.]</td>
<td>Q1 30</td>
<td>+   5</td>
</tr>
<tr>
<td>INFO0051-1</td>
<td>Logic (english language) - Pascal Gribomont</td>
<td>- [10h Proj.]</td>
<td>Q1 30</td>
<td>+   5</td>
</tr>
<tr>
<td>ELEN0060-2</td>
<td>Information and coding theory (english language) - Louis Wehenkel</td>
<td>- [30h Proj.]</td>
<td>Q2 30</td>
<td>+   5</td>
</tr>
<tr>
<td>GEST3162-1</td>
<td>Principles of management (english language) - Michael Ghilissen,</td>
<td>François Pichault, Thierry Pironet, Didier Van Cailie</td>
<td>Q1 25</td>
<td>-   5</td>
</tr>
<tr>
<td>PROJ0010-1</td>
<td>Integrated software project, including fundamentals in project management</td>
<td>- [290h Proj.]</td>
<td>TA 10</td>
<td>+   10</td>
</tr>
</tbody>
</table>

Optional courses

Choose one focus among the three below:

Professional focus on "Computer systems and networks"

Compulsory Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Instructor(s)</th>
<th>Credits</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFO0031-1</td>
<td>Computer network architectures and multimedia (english language) -</td>
<td>Guy Leduc</td>
<td>Q1 35</td>
<td>+   5</td>
</tr>
<tr>
<td></td>
<td>醴</td>
<td>- [10h Labo., 25h Proj.]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO0045-3</td>
<td>Introduction to computer security (english language) - Benoît Donnet</td>
<td>- [8h Labo., 30h Proj.]</td>
<td>Q2 30</td>
<td>+   5</td>
</tr>
<tr>
<td></td>
<td>醴</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INFO0064-2</td>
<td>Embedded systems (english language) - Bernard Boigelot</td>
<td></td>
<td>Q1 25</td>
<td>3</td>
</tr>
<tr>
<td>INFO2055-1</td>
<td>Embedded systems project (english language) - Bernard Boigelot</td>
<td></td>
<td>Q2</td>
<td>+   2</td>
</tr>
</tbody>
</table>

ULg : Students and Studies Administration - Academic Affairs
Contact : Monique Marcourt, General Director for Education and Training
Date of data : 01/10/2017 - Page 1 / 7
### Corequisite: INFO0064-2 - Embedded systems

**INFO0941-1**  
*Network measurement and monitoring* (english language)  
Benoît DONNET - [60h Proj.]

**INFO0031-1**  
*Computer network architectures and multimedia*

**INFO0941-1**  
*Object-oriented programming on mobile devices* (english language)  
Laurent MATHY - [90h Proj.]

**INFO0056-1**  
*Managing and securing computer networks* (english language)  
Guy LEDUC - [12h Labo., 55h Proj.]

**INFO0045-3**  
*Introduction to computer security*

**INFO0056-1**  
*Introduction to audio and video techniques* (english language)  
JeanJacques EMBRECHTS - [8h Labo.]

**INFO0939-1**  
*High performance scientific computing* (english language)  
Christophe GEUZAIN - [20h Proj.]

**INFO8002-1**  
*Large-scale database systems* (english language)  
Gilles LOUPPE - [45h Proj.]

#### Professional focus on "Intelligent Systems"

**Compulsory Courses**

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

**INFO0051-1**  
*Logic*

**ELEN0062-1**  
*Computer vision* (english language)  
Marc VAN DROGENBROECK - [50h Proj.]

**INFO0948-2**  
*Introduction to intelligent robotics* (english language)  
Renaud DETRY - [80h Proj.]

**INFO0049-1**  
*Knowledge representation* (english language)  
Pascal GRIBOMONT - [50h Proj.]

**ELEN0062-1**  
*Introduction to audio and video techniques* (english language)  
JeanJacques EMBRECHTS - [8h Labo.]

**INFO0941-1**  
*Network measurement and monitoring* (english language)  
Benoît DONNET - [60h Proj.]

**Corequisite:**

**INFO0064-2**  
*Embedded systems* 

**INFO0031-1**  
*Computer network architectures and multimedia*

**INFO0941-1**  
*Object-oriented programming on mobile devices* (english language)  
Laurent MATHY - [90h Proj.]

**INFO0056-1**  
*Managing and securing computer networks* (english language)  
Guy LEDUC - [12h Labo., 55h Proj.]

**INFO0045-3**  
*Introduction to computer security*

**INFO0056-1**  
*Introduction to audio and video techniques* (english language)  
JeanJacques EMBRECHTS - [8h Labo.]

**INFO0939-1**  
*High performance scientific computing* (english language)  
Christophe GEUZAIN - [20h Proj.]

**INFO8002-1**  
*Large-scale database systems* (english language)  
Gilles LOUPPE - [45h Proj.]

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

**INFO0051-1**  
*Logic*

**ELEN0062-1**  
*Computer vision* (english language)  
Marc VAN DROGENBROECK - [50h Proj.]

**INFO0948-2**  
*Introduction to intelligent robotics* (english language)  
Renaud DETRY - [80h Proj.]

**INFO0049-1**  
*Knowledge representation* (english language)  
Pascal GRIBOMONT - [50h Proj.]

**ELEN0062-1**  
*Introduction to audio and video techniques* (english language)  
JeanJacques EMBRECHTS - [8h Labo.]

**INFO0941-1**  
*Network measurement and monitoring* (english language)  
Benoît DONNET - [60h Proj.]

**Corequisite:**

**INFO0064-2**  
*Embedded systems* 

**INFO0031-1**  
*Computer network architectures and multimedia*

**INFO0941-1**  
*Object-oriented programming on mobile devices* (english language)  
Laurent MATHY - [90h Proj.]

**INFO0056-1**  
*Managing and securing computer networks* (english language)  
Guy LEDUC - [12h Labo., 55h Proj.]

**INFO0045-3**  
*Introduction to computer security*

**INFO0056-1**  
*Introduction to audio and video techniques* (english language)  
JeanJacques EMBRECHTS - [8h Labo.]

**INFO0939-1**  
*High performance scientific computing* (english language)  
Christophe GEUZAIN - [20h Proj.]

**INFO8002-1**  
*Large-scale database systems* (english language)  
Gilles LOUPPE - [45h Proj.]

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

**INFO0051-1**  
*Logic*

**ELEN0062-1**  
*Computer vision* (english language)  
Marc VAN DROGENBROECK - [50h Proj.]

**INFO0948-2**  
*Introduction to intelligent robotics* (english language)  
Renaud DETRY - [80h Proj.]

**INFO0049-1**  
*Knowledge representation* (english language)  
Pascal GRIBOMONT - [50h Proj.]

**ELEN0062-1**  
*Introduction to audio and video techniques* (english language)  
JeanJacques EMBRECHTS - [8h Labo.]

**INFO0941-1**  
*Network measurement and monitoring* (english language)  
Benoît DONNET - [60h Proj.]

**Corequisite:**

**INFO0064-2**  
*Embedded systems* 

**INFO0031-1**  
*Computer network architectures and multimedia*

**INFO0941-1**  
*Object-oriented programming on mobile devices* (english language)  
Laurent MATHY - [90h Proj.]

**INFO0056-1**  
*Managing and securing computer networks* (english language)  
Guy LEDUC - [12h Labo., 55h Proj.]

**INFO0045-3**  
*Introduction to computer security*
INFO8003-1  Optimal decision making for complex problems (english language) - Damien ERNST - [45h Proj.]
INFO8004-1  Advanced Machine learning (english language) - [45h Proj.]

Professional focus on "Management"

Registration to this focus only with a file (contact: C. Puit)

Compulsory Courses

FINA0001-1  Financial statement analysis and financing an enterprise
ECON2259-1  Microeconomics and industrial economy - Axel GAUTIER, Bernard THIRY
LOGI0010-1  Supply Chain Management (english language) - Yasemin ARDA

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

ATFE0015-1  Master thesis (english language) - COLLÉGIALITÉ, Laurent MATHY - [750h Proj.]

Optional courses

Carry on the focus during the second bloc:

Professional focus on "Computer systems and networks"

Students choosing this focus shall select 15 credits of elective courses inside the focus. The remaining credits can be taken inside or outside the focus.

INFO0064-2  Embedded systems (english language) - Bernard BOIGELOT
INFO2055-1  Embedded systems project (english language) - Bernard BOIGELOT - [60h Proj.]
            Corequisite : INFO0064-2 - Embedded systems
INFO0941-1  Network measurement and monitoring (english language) - Benoît DONNET - [60h Proj.]
            Corequisite : INFO0031-1 - Computer network architectures and multimedia
INFO2051-1  Object-oriented programming on mobile devices (english language) - Laurent MATHY - [90h Proj.]
INFO0056-1  Managing and securing computer networks (english language) - Guy LEDUC - [12h Labo., 55h Proj.]
            Corequisite : INFO0045-3 - Introduction to computer security
ELEN0002-2  Introduction to audio and video techniques (english language) - JeanJacques EMBRECHTS - [8h Labo.]
INFO0939-1  High performance scientific computing (english language) - Christophe GEUZAIN - [20h Proj.]
INFO8002-1  Large-scale database systems (english language) - Gilles LOUPPE - [45h Proj.]

Professional focus on "Intelligent Systems"

Compulsory Courses
### Master of science in computer science and engineering (120 ECTS)

**Compulsory Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Language</th>
<th>Credits</th>
<th>Block</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>ERAS0011-1</td>
<td>Business Simulation (english language) - Anne CHANTEUX</td>
<td>[50h Mon. WS]</td>
<td>Q1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>GRHO0001-4</td>
<td>Strategic Human Resources Management - François PICHault</td>
<td></td>
<td>Q1</td>
<td>45</td>
<td>-</td>
</tr>
<tr>
<td>DROI0174-2</td>
<td>Commercial law - Frédéric DAERDEN, Laurent STAS DE RICHELLE</td>
<td></td>
<td>Q2</td>
<td>45</td>
<td>-</td>
</tr>
</tbody>
</table>

Students choosing this focus shall select, in addition to 12 credits of compulsory courses, 3 credits of elective courses inside the focus. One of the 3 language courses belonging to the focus must necessarily be chosen as an option in either block 1 or block 2. The remaining credits can be taken outside the focus.

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Language</th>
<th>Credits</th>
<th>Block</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>LANG1936-1</td>
<td>Elementary Dutch 1 - Doris DE LAET</td>
<td></td>
<td>TA</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td>LANG1933-1</td>
<td>Elementary German 1 - Marie MAWHIN</td>
<td></td>
<td>Q2</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td>LANG1934-1</td>
<td>Elementary Spanish 1 - Alexis ALVAREZ BARBOSA</td>
<td></td>
<td>Q2</td>
<td>30</td>
<td>-</td>
</tr>
</tbody>
</table>

Choose remaining credits in the lists below:

**Optional courses outside the focus**
The following courses 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 computer science, or unless the corresponding knowledge and skills have been acquired previously.

MATH0500-1 *Introduction to numerical algorithmic* - Quentin LOUVEAUX - [6h Labo., 45h Proj.] Q1 24 14 [+ 5

INFO2050-1 *Advanced computer programming* - Pierre GEURTS - [40h Proj.] Q1 25 20 [+ 5

INFO0010-4 *Introduction to computer networking* (english language) - Guy LEDUC - [12h Labo., 40h Proj.] Q2 35 2 [+ 5

INFO0012-2 *Computations structures* (english language) - Pierre WOLPER - [40h Proj.] Q1 30 25 [+ 5

INFO0940-1 *Operating systems* (english language) - Laurent MATHY - [30h Proj.] Q2 30 6 [+ 5

**Computer systems and networks**

INFO0031-1 *Computer network architectures and multimedia* (english language) - Guy LEDUC - [10h Labo., 25h Proj.] Q1 35 - [+ 5

INFO0045-3 *Introduction to computer security* (english language) - Benoît DONNET - [8h Labo., 30h Proj.] Q2 30 10 [+ 5

INFO0941-1 *Network measurement and monitoring* (english language) - Benoît DONNET - [60h Proj.] Q2 20 - [+ 5

Corequisite:
INFO0031-1 - Computer network architectures and multimedia

INFO2051-1 *Object-oriented programming on mobile devices* (english language) - Laurent MATHY - [90h Proj.] Q2 15 10 [+ 5

INFO0056-1 *Managing and securing computer networks* (english language) - Guy LEDUC - [12h Labo., 55h Proj.] Q2 30 - [+ 5

Corequisite:
INFO0045-3 - Introduction to computer security

ELEN0002-2 *Introduction to audio and video techniques* (english language) - JeanJacques EMBRECHTS - [8h Labo.] Q1 30 22 [+ 5

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

INFO2060-1 *Advanced operating systems* (english language) - Laurent MATHY Q1 30 30 - 5

**Intelligent Systems**

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

Corequisite:
MATH0462-1 - Discrete optimization

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

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

Corequisite:
ELEN0016-2 - Computer vision
ELEN0062-1 - Introduction to machine learning

INFO0049-1 *Knowledge representation* (english language) - Pascal GRIBOMONT - [50h Proj.] Q2 30 25 [+ 5

Corequisite:
INFO0051-1 - Logic

INFO2046-2 *Computational geometry* (english language) - Eric BÉCHET - [95h Proj.] Q1 25 - [+ 5

INFO2049-1 *Web and Text Analytics* (english language) - Ashwin ITTOO Q1 30 - - 5

Corequisite:
ELEN0062-1 - Introduction to machine learning
GBIO0002-1  Genetics and bioinformatics (english language) - Franck DEQUIEDT, Kristel VAN STEEN - [15h Proj.]  

Other optional courses

INFO0064-2  Embedded systems (english language) - Bernard BOIGELOT  
INFO2055-1  Embedded systems project (english language) - Bernard BOIGELOT - [60h Proj.]  
Corequisite : INFO0064-2 - Embedded systems

INFO0050-1  Constraint programming projects (english language) - Pascal GRIBOMONT - [80h Proj.]  
Corequisite : INFO0049-1 - Knowledge representation

INFO0060-1  Concurrent system verification and temporal logic (english language) - Bernard BOIGELOT, Pascal GRIBOMONT, Pierre WOLPER - [20h Proj.]  
Prerequisite : INFO0051-1 - Logic
INFO00016-1 - Introduction to the theory of computation

INFO0026-3  Computer graphics (english language) - Eric BÉCHET - [45h Proj.]  

GBIO0009-1  Topics in bioinformatics (english language) - Kristel VAN STEEN - [35h Proj.]  
Prerequisite : GBIO0002-1 - Genetics and bioinformatics

ELEN0019-2  Audio signal processing : principles and experiments (english language) - JeanJacques EMBRECHTS - [24h Labo., 30h Proj.]  

MATH0461-2  Introduction to numerical optimization (english language) - Quentin LOUEAUX - [25h Proj.]  

GBIO0030-1  Computational approaches to statistical generics (english language) - Kristel VAN STEEN - [35h Proj.]  
Prerequisite : GBIO0002-1 - Genetics and bioinformatics

INGE0012-1  Scientific research in engineering and its impact on innovation (english language) - Rodolphe SEPULCHRE  

INFO8005-1  Semantic Data (english language) - N... - [45h Proj.]  
INFO8006-1  Introduction to artificial intelligence (english language) - Gilles LOUPPE - [45h Proj.]  

Internships and projects (maximum 15 credits)

ASTG9005-1  Research Internship (english language) - Benoît DONNET - [300h Proj.]  

ASTG0021-1  Technical company internship (english language) - Laurent MATHY - [300h Proj.]  
Notice : the two company internships are mutually exclusive

PROJ0011-1  Personal student project (english language) - Bernard BOIGELOT, COLLEGIALITÉ - [150h Proj.]  

With the agreement of the jury, choose 5 credits in any course programme of the University

Bloc d’aménagement du programme de l’année

Additional ECTS Master of science in computer science and engineering

Students that are admitted to the master of science in Computer Science and Engineering without having obtained a degree
of bachelor in engineering must add to their programme the following list of courses, to be taken in the first year of the master.

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Instructor</th>
<th>Credits</th>
<th>Contact Hours</th>
<th>备考</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFO2050-1</td>
<td>Advanced computer programming</td>
<td>Pierre Geurts</td>
<td>25</td>
<td>20</td>
<td>[+ ]</td>
<td>5</td>
</tr>
<tr>
<td>MATH0495-1</td>
<td>Elements of probability calculus</td>
<td>Pascal GRIBOMONT</td>
<td>15</td>
<td>15</td>
<td>[+ ]</td>
<td>3</td>
</tr>
<tr>
<td>MATH0500-1</td>
<td>Introduction to numerical algorithmic</td>
<td>Quentin LOUVEAUX</td>
<td>24</td>
<td>14</td>
<td>[+ ]</td>
<td>5</td>
</tr>
<tr>
<td>INFO0027-2</td>
<td>Programming techniques (english language)</td>
<td>Laurent MATHY</td>
<td>30</td>
<td>24</td>
<td>[+ ]</td>
<td>5</td>
</tr>
<tr>
<td>INFO0030-3</td>
<td>Programming Projects</td>
<td>Benoît DONNET</td>
<td>20</td>
<td>-</td>
<td>[+ ]</td>
<td>5</td>
</tr>
<tr>
<td>MATH1222-3</td>
<td>Introduction to stochastic processes, Markov chains</td>
<td>Pierre Geurts</td>
<td>20</td>
<td>10</td>
<td>[+ ]</td>
<td>5</td>
</tr>
</tbody>
</table>