Cycle view of the study programme

		Bl	Or	Th	Pr	Au	Cr

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 65 credits of the compulsory courses (including the master thesis), choose 30 credits from the professional focus and take 25 credits of optional courses.
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 from the core curriculum (B1 : 40Cr, B2 : 25Cr)

INFO0085-1	*Compilers* (english language) - Pascal FONTAINE - [75h Proj.] **Corequisite :** INFO0940-1 - Operating systems INFO0012-2 - Computation structures INFO0016-1 - Introduction to the theory of computation	B1	Q2	25	-	[+]	**5**
ELEN0062-1	*Introduction to machine learning* (english language) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B1	Q1	30	5	[+]	**5**
INFO0016-1	*Introduction to the theory of computation* (english language) - Quentin LOUVEAUX	B1	Q1	26	26	-	**5**
INFO0940-1	*Operating systems* (english language) - Laurent MATHY - [30h Proj.] **Corequisite :** INFO9012-1 - Parallel Programming INFO0012-2 - Computation structures	B1	Q2	30	6	[+]	**5**
ELEN0060-2	*Information and coding theory* (english language) - Louis WEHENKEL - [30h Proj.]	B1	Q2	30	15	[+]	**5**
GEST3162-1	*Principles of management* (english language) - Michaël PARMENTIER, Willem STANDAERT - [25h Proj.]	B1	Q1	30	-	[+]	**5**
PROJ0010-1	*Software project engineering and management* (english language) - Benoît DONNET, Bernard HAUZEUR, Laurent MATHY - [280h Proj.] **Prerequisite :** INFO0062-1 - Object-oriented programming **Corequisite :** INFO0010-4 - Introduction to computer networking INFO0902-1 - Structures des données et algorithmes	B1	TA	20	-	[+]	**10**
ATFE0015-1	*Master thesis* (english language) - COLLÉGIALITÉ, Laurent MATHY - [750h Proj.]	B2	TA	-	-	[+]	**25**

Optional courses from the core curriculum (B1 : 5Cr, B2 : 20Cr)

Choose remaining credits in the lists below : (B1 : 5Cr, B2 : 20Cr)

Optional courses outside the focus

Computer Science foundation courses

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 of science in engineering, or unless the corresponding knowledge and skills have been acquired previously.

INFO0902-1	*Data structures and algorithms* - Pierre GEURTS - [40h Proj.]	B1	Q2	26	20	[+]	**5**
INFO0010-4	*Introduction to computer networking* (english language) - Savvas KASTANAKIS - [12h Labo., 40h Proj.]	B1	Q1	32	2	[+]	**5**
INFO0012-2	*Computation structures* (english language) - Pascal FONTAINE, Laurent MATHY - [40h Proj.]	B1	Q1	26	26	[+]	**5**
INFO0062-1	*Object-oriented programming* (english language) - Bernard BOIGELOT - [20h Proj.]	B1	Q2	25	20	[+]	**5**

INFO9012-1	*Parallel Programming* (english language) - Pascal FONTAINE	B1	Q2	25	25	-	**5**

Computer systems security

INFO0031-1	*Network Engineering* (english language) - Benoît DONNET - [12h Labo., 30h Proj.]	-	Q2	30	-	[+]	**5**
INFO0045-3	*Introduction to computer security* (english language) - Benoît DONNET - [10h Labo., 30h Proj.] **Corequisite :** INFO0010-4 - Introduction to computer networking INFO0012-2 - Computation structures INFO0902-1 - Structures des données et algorithmes	-	Q1	30	6	[+]	**5**

Intelligent Systems

INFO8010-1	*Deep learning* (english language) - Gilles LOUPPE - [60h Proj.] **Corequisite :** ELEN0062-1 - Introduction to machine learning	-	Q2	30	-	[+]	**5**
INFO9015-1	*Logic for Computer Science* (english language) - Pascal FONTAINE	-	Q1	24	20	-	**5**

Other optional courses

INFO9015-1	*Logic for Computer Science* (english language) - Pascal FONTAINE	-	Q1	24	20	-	**5**
INFO0060-1	*Introduction to computer systems verification* (english language) - Bernard BOIGELOT, Pascal FONTAINE - [20h Proj.] **Corequisite :** INFO0016-1 - Introduction to the theory of computation INFO9015-1 - Logic for Computer Science	-	Q2	20	20	[+]	**5**
INFO0027-2	*Programming techniques* (english language) - *Algorithmics* - Laurent MATHY - [40h Proj.] - *Software patterns* - Laurent MATHY - [30h Proj.]	-	Q2 14 10	 14 10	 [+] [+]		**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**
GBIO0030-1	*Computational approaches to statistical generics* (english language) - Kristel VAN STEEN - [35h Proj.] **Prerequisite :** GBIO0002-1 - Genetics and bioinformatics	-	Q2	25	15	[+]	**5**
MECA0524-1	*CAD & Geometric Algorithms* - Eric BÉCHET - [60h Proj.]	-	Q1	20	20	[+]	**5**
INFO0004-2	*Object-oriented programming projects* (english language) - Laurent MATHY - [90h Proj.]	-	Q2	20	-	[+]	**5**
GBIO0031-1	*Learning from genomic data* (english language) - Kristel VAN STEEN - [150h Proj.]	-	Q2	-	-	[+]	**5**
INFO0054-1	*Functional programming* - Christophe DEBRUYNE - [20h Proj.]	-	Q1	24	24	[+]	**5**
MQGE9007-1	*Advanced Modeling Techniques in Optimization* (english language) - Jérôme DE BOECK, Quentin LOUVEAUX **Corequisite :** MATH0461-2 - Introduction to numerical optimization	-	Q1	30	-	-	**5**

[...] Choose a maximum of 5 credits from the list of courses common to both the core curriculum and the focus within block 1, as shown in the online course catalogue.

INFO0056-1	*Securing Networks* (english language) - Savvas KASTANAKIS - [12h Labo., 30h Proj.] (Even years) **Corequisite :** INFO0010-4 - Introduction to computer networking INFO0045-3 - Introduction to computer security	-	Q2	30	-	[+]	**5**

INFO0939-1	*High performance scientific computing* (english language) - Christophe GEUZAINE - [20h Proj.]	-	Q1	30	15	[+]	**5**
INFO8002-1	*Topics in Distributed Systems* (english language) - Bernard BOIGELOT, Christophe DEBRUYNE, Pascal FONTAINE, Laurent MATHY - [35h Proj.] (Odd years)	-	Q2	30	-	[+]	**5**
INFO8012-1	*Digital Forensics* (english language) - Benoît DONNET, Laurent MATHY - [12h Labo., 30h Proj.] (Even years) **Corequisite :** INFO0010-4 - Introduction to computer networking INFO0085-1 - Compilers INFO0940-1 - Operating systems	-	Q2	30	-	[+]	**5**
INFO8011-1	*Network infrastructures* (english language) - Benoît DONNET, Savvas KASTANAKIS, Laurent MATHY - [8h Labo., 30h Proj.] **Corequisite :** INFO0010-4 - Introduction to computer networking	-	Q1	30	-	[+]	**5**
INFO8013-1	*Advanced Computer Security* (english language) - Benoît DONNET, Laurent MATHY - [20h Labo., 30h Proj.] (Odd years) **Corequisite :** INFO0045-3 - Introduction to computer security	-	Q2	20	-	[+]	**5**
ELEN0450-1	*Multimedia Systems* (english language) - Anthony CIOPPA	-	Q1	24	30	-	**5**
ELEN0016-2	*Computer vision* (english language) - Anthony CIOPPA, Adrien DELIÈGE, Marc VAN DROOGENBROECK - [50h Proj.]	-	Q1	30	10	[+]	**5**
INFO0948-2	*Introduction to intelligent robotics* (english language) - Pierre SACRÉ - [80h Proj.]	-	Q2	30	4	[+]	**5**
INFO2049-1	*Artificial intelligence methods for natural language processing* (english language) - Ashwin ITTOO	-	Q1	30	-	-	**5**
GBIO0002-1	*Genetics and bioinformatics* (english language) - Franck DEQUIEDT, Kristel VAN STEEN - [15h Proj.]	-	Q1	30	15	[+]	**5**
INFO8003-1	*Reinforcement learning* (english language) - Damien ERNST - [45h Proj.]	-	Q2	25	10	[+]	**5**
INFO8004-1	*Advanced Machine learning* (english language) - Pierre GEURTS, Gilles LOUPPE, Louis WEHENKEL - [20h Proj.] **Corequisite :** INFO8010-1 - Deep learning ELEN0062-1 - Introduction to machine learning	-	Q2	25	-	[+]	**5**
INFO8006-1	*Introduction to artificial intelligence* (english language) - Gilles LOUPPE - [45h Proj.]	-	Q1	25	20	[+]	**5**
INFO9014-1	*Knowledge representation and reasoning* (english language) - Christophe DEBRUYNE - [45h Proj.] **Corequisite :** INFO9015-1 - Logic for Computer Science	-	Q2	24	20	[+]	**5**
INFO9023-1	*Machine Learning Systems Design* (english language) - [17h Labo., 18h Proj.]	-	Q2	17	-	[+]	**5**
ELEN0449-1	*Computer Vision understanding* (english language) - Anthony CIOPPA - [50h Proj.]	-	Q2	24	10	[+]	**5**
INFO9030-1	*Explainable Artificial Intelligence* (english language) - Vân Anh HUYNHTHU - [50h Proj.]	-	Q2	24	-	[+]	**5**
INFO9016-1	*Advanced Databases* (english language) - Christophe DEBRUYNE - [20h Proj.]	-	Q1	24	20	[+]	**5**
INFO0064-2	*Embedded systems* (english language) - Bernard BOIGELOT	-	Q1	25	20	-	**3**
INFO2055-1	*Embedded systems project* (english language) -	-	Q2	-	-	[+]	**2**

	OIGELOT - [60h Proj.] **Corequisite :** INFO0064-2 - Embedded systems						
INFO2051-1	*Object-oriented programming on mobile devices* (english language) - Laurent MATHY - [90h Proj.]	-	Q1	15	10	[+]	**5**
[...]	Choose a maximum of 20 credits from the list of courses common to both the core curriculum and the focus within block 2, as shown in the online course catalogue.						
INFO0056-1	*Securing Networks* (english language) - Savvas KASTANAKIS - [12h Labo., 30h Proj.] (Even years) **Corequisite :** INFO0010-4 - Introduction to computer networking INFO0045-3 - Introduction to computer security	-	Q2	30	-	[+]	**5**
INFO0939-1	*High performance scientific computing* (english language) - Christophe GEUZAINE - [20h Proj.]	-	Q1	30	15	[+]	**5**
INFO8002-1	*Topics in Distributed Systems* (english language) - Bernard BOIGELOT, Christophe DEBRUYNE, Pascal FONTAINE, Laurent MATHY - [35h Proj.] (Odd years)	-	Q2	30	-	[+]	**5**
INFO8012-1	*Digital Forensics* (english language) - Benoît DONNET, Laurent MATHY - [12h Labo., 30h Proj.] (Even years) **Corequisite :** INFO0010-4 - Introduction to computer networking INFO0085-1 - Compilers INFO0940-1 - Operating systems	-	Q2	30	-	[+]	**5**
INFO8011-1	*Network infrastructures* (english language) - Benoît DONNET, Savvas KASTANAKIS, Laurent MATHY - [8h Labo., 30h Proj.] **Corequisite :** INFO0010-4 - Introduction to computer networking	-	Q1	30	-	[+]	**5**
INFO8013-1	*Advanced Computer Security* (english language) - Benoît DONNET, Laurent MATHY - [20h Labo., 30h Proj.] (Odd years) **Corequisite :** INFO0045-3 - Introduction to computer security	-	Q2	20	-	[+]	**5**
ELEN0450-1	*Multimedia Systems* (english language) - Anthony CIOPPA	-	Q1	24	30	-	**5**
ELEN0016-2	*Computer vision* (english language) - Anthony CIOPPA, Adrien DELIÈGE, Marc VAN DROOGENBROECK - [50h Proj.]	-	Q1	30	10	[+]	**5**
INFO0948-2	*Introduction to intelligent robotics* (english language) - Pierre SACRÉ - [80h Proj.]	-	Q2	30	4	[+]	**5**
INFO2049-1	*Artificial intelligence methods for natural language processing* (english language) - Ashwin ITTOO	-	Q1	30	-	-	**5**
GBIO0002-1	*Genetics and bioinformatics* (english language) - Franck DEQUIEDT, Kristel VAN STEEN - [15h Proj.]	-	Q1	30	15	[+]	**5**
INFO8003-1	*Reinforcement learning* (english language) - Damien ERNST - [45h Proj.]	-	Q2	25	10	[+]	**5**
INFO8004-1	*Advanced Machine learning* (english language) - Pierre GEURTS, Gilles LOUPPE, Louis WEHENKEL - [20h Proj.] **Corequisite :** INFO8010-1 - Deep learning ELEN0062-1 - Introduction to machine learning	-	Q2	25	-	[+]	**5**
INFO8006-1	*Introduction to artificial intelligence* (english language) - Gilles LOUPPE - [45h Proj.]	-	Q1	25	20	[+]	**5**
INFO9014-1	*Knowledge representation and reasoning* (english language) - Christophe DEBRUYNE - [45h Proj.] **Corequisite :**	-	Q2	24	20	[+]	**5**

	INFO9015-1 - Logic for Computer Science						
INFO9023-1	*Machine Learning Systems Design* (english language) - [17h Labo., 18h Proj.]	-	Q2	17	-	[+]	**5**
ELEN0449-1	*Computer Vision understanding* (english language) - Anthony CIOPPA - [50h Proj.]	-	Q2	24	10	[+]	**5**
INFO9030-1	*Explainable Artificial Intelligence* (english language) - Vân Anh HUYNHTHU - [50h Proj.]	-	Q2	24	-	[+]	**5**
INFO9016-1	*Advanced Databases* (english language) - Christophe DEBRUYNE - [20h Proj.]	-	Q1	24	20	[+]	**5**
INFO0064-2	*Embedded systems* (english language) - Bernard BOIGELOT	-	Q1	25	20	-	**3**
INFO2055-1	*Embedded systems project* (english language) - Bernard BOIGELOT - [60h Proj.] **Corequisite :** INFO0064-2 - Embedded systems	-	Q2	-	-	[+]	**2**
INFO2051-1	*Object-oriented programming on mobile devices* (english language) - Laurent MATHY - [90h Proj.]	-	Q1	15	10	[+]	**5**

[...] With the agreement of the jury, choose 5 credits in any course programme of the University or from the UNIC course catalog.

Internships and projects (maximum 15 credits)

ASTG9005-1	*Research Internship* (english language) - Benoît DONNET - [300h Proj.] **Prerequisite :** PROJ0010-1 - Software project engineering and management	B2	TA	-	-	[+]	**10**
ASTG0021-1	*Technical company internship* (english language) - Laurent MATHY - [300h Proj.] **Prerequisite :** PROJ0010-1 - Software project engineering and management *Notice* : the two company internships are mutually exclusive	B2	TA	-	-	[+]	**10**
PROJ0011-1	*Personal student project* (english language) - Bernard BOIGELOT, COLLÉGIALITÉ - [150h Proj.]	-	TA	-	-	[+]	**5**

Compulsory courses within the focus (B1 : 10Cr)

INFO8010-1	*Deep learning* (english language) - Gilles LOUPPE - [60h Proj.]	B1	Q2	30	-	[+]	**5**
SYST0022-1	*Linear Systems Design* (english language) - Guillaume DRION, Pierre SACRÉ - [15h Proj.]	B1	Q2	26	26	[+]	**5**

Optional courses within the focus (B1 : 5Cr, B2 : 15Cr)

Students choosing this focus shall select, in addition to 10 credits of compulsory courses, 45 credits of elective courses inside or outside the focus. However, for his/her whole master program (block 1 and block 2), a total of 20 credits of options must be taken inside the focus. The regulation allows students to choose elective courses during the block of their choice, in accordance with the prerequisites and co-requisites. Students must also be attentive to schedule constraints. (B1 : 5Cr, B2 : 15Cr)

ELEN0016-2	*Computer vision* (english language) - Anthony CIOPPA, Adrien DELIÈGE, Marc VAN DROOGENBROECK - [50h Proj.]	-	Q1	30	10	[+]	**5**
INFO0948-2	*Introduction to intelligent robotics* (english language) - Pierre SACRÉ - [80h Proj.]	-	Q2	30	4	[+]	**5**
INFO2049-1	*Artificial intelligence methods for natural language processing* (english language) - Ashwin ITTOO **Corequisite :** ELEN0062-1 - Introduction to machine learning	-	Q1	30	-	-	**5**
GBIO0002-1	*Genetics and bioinformatics* (english language) - Franck DEQUIEDT, Kristel VAN STEEN - [15h Proj.]	-	Q1	30	15	[+]	**5**

DROI1357-1	*European law, (big) data and artificial intelligence applications seminar* (english language) - Jérôme DE COOMAN, Ljupcho GROZDANOVSKI	-	Q1	24	-	-	**5**
INFO8003-1	*Reinforcement learning* (english language) - Damien ERNST - [45h Proj.]	-	Q2	25	10	[+]	**5**
INFO8004-1	*Advanced Machine learning* (english language) - Pierre GEURTS, Gilles LOUPPE, Louis WEHENKEL - [20h Proj.]	-	Q2	25	-	[+]	**5**
INFO8006-1	*Introduction to artificial intelligence* (english language) - Gilles LOUPPE - [45h Proj.]	-	Q1	25	20	[+]	**5**
INFO9014-1	*Knowledge representation and reasoning* (english language) - Christophe DEBRUYNE - [45h Proj.] **Corequisite :** INFO9015-1 - Logic for Computer Science	-	Q2	24	20	[+]	**5**
INFO9023-1	*Machine Learning Systems Design* (english language) - [17h Labo., 18h Proj.] **Corequisite :** ELEN0062-1 - Introduction to machine learning	-	Q2	17	-	[+]	**5**
INFO9030-1	*Explainable Artificial Intelligence* (english language) - Vân Anh HUYNHTHU - [50h Proj.]	-	Q2	24	-	[+]	**5**
ELEN0449-1	*Computer Vision understanding* (english language) - Anthony CIOPPA - [50h Proj.]	-	Q2	24	10	[+]	**5**

Bridging courses Master MSc. in Computer Science and Engineering (120 credits)

Compulsory Courses (B0 : 47Cr)

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.

MATH0495-1	*Elements for calculating probabilities* - *Part 1: Analysis tools for probabilities* - Laurent LOOSVELDT - *Part 2: Probability theory* - Laurent LOOSVELDT	B0	Q1 6 20	 6 20	 - -		**5**
MATH0006-3	*Introduction to numerical analysis* (english language) - Quentin LOUVEAUX	B0	Q1	20	20	-	**5**
INFO0054-1	*Functional programming* - Christophe DEBRUYNE - [20h Proj.]	B0	Q1	24	24	[+]	**5**
INFO0030-3	*Programming Projects* - Benoît DONNET - [100h Proj.]	B0	Q2	20	-	[+]	**5**
ELEN0040-1	*Digital electronics* (english language) - JeanMichel REDOUTÉ	B0	Q2	26	26	-	**5**
MECA0003-2	*Rational Mechanics* - Eric DELHEZ	B0	Q1	20	30	-	**5**
LANG6011-1	*Remedial English for Computer Science* (english language) - Adnan VESSEUR	B0	Q2	3	27	-	**3**
DROI0101-1	*Computer Law Contracts* - Benoît KOHL	B0	Q2	30	-	-	**4**
GENV0002-1	*Energy and sustainable development* - Pierre DEWALLEF, Damien ERNST, Sigrid REITER, Motiar Rahaman X - [12h Proj.]	B0	Q2	26	8	[+]	**3**
MATH0504-1	*Applied mathematics* - Benjamin DEWALS, Christophe GEUZAINE	B0	Q1	26	26	-	**5**