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 one of the three professional foci 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 (B1 : 40Cr, B2 : 25Cr)

INFO0085-1	*Compilers* (english language) - Pascal FONTAINE - [75h Proj.] **Corequisite :** INFO0016-1 - Introduction to the theory of computation INFO0012-2 - Computation structures INFO0940-1 - Operating systems	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.] **Prerequisite :** INFO0012-2 - Computation structures **Corequisite :** INFO9012-1 - Parallel Programming	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) - François PICHAULT, Willem STANDAERT - [25h Proj.]	B1	Q1	30	-	[+]	**5**
PROJ0010-1	*Software project engineering and management* (english language) - Benoît DONNET, Bernard HAUZEUR, Guy LEDUC, 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 (B1 : 20Cr, B2 : 35Cr)

Students will choose one of the focus below and will carry it on during the second bloc (B1 : 15Cr, B2 : 15Cr)

Professional focus on "Computer systems security" (B1 : 15Cr, B2 : 15Cr)

Compulsory Courses

INFO0031-1	*Network Engineering* (english language) - Benoît DONNET, Guy LEDUC - [12h Labo., 30h Proj.] **Corequisite :** INFO0010-4 - Introduction to computer networking	B1	Q2	30	-	[+]	**5**
INFO0045-3	*Introduction to computer security* (english language) - Benoît DONNET - [10h Labo., 30h Proj.] **Corequisite :** INFO0902-1 - Structures des données et algorithmes INFO0010-4 - Introduction to computer networking INFO0012-2 - Computation structures	B1	Q1	30	6	[+]	**5**

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)

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**
INFO0056-1	*Securing Networks* (english language) - Guy LEDUC - [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	*Large-scale data systems* (english language) - Gilles LOUPPE - [45h Proj.]	-	Q1	25	10	[+]	**5**
INFO8012-1	*Digital Forensics* (english language) - [12h Labo., 30h Proj.] (Even years) **Corequisite :** INFO0940-1 - Operating systems INFO0085-1 - Compilers INFO0010-4 - Introduction to computer networking	-	Q2	30	-	[+]	**5**
INFO8011-1	*Network infrastructures* (english language) - Benoît DONNET, Guy LEDUC, Laurent MATHY - [12h Labo., 30h Proj.] (Odd years) **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**
INFO9016-1	(pas organisé en 2021-2022) *Advanced Databases* (english language)	-	Q2	24	20	-	**5**

Professional focus on "Intelligent Systems" (B1 : 15Cr, B2 : 15Cr)

Compulsory Courses

INFO8010-1	*Deep learning* (english language) - Gilles LOUPPE - [55h Proj.]	B1	Q2	25	10	[+]	**5**
SYST0003-1	*Linear control systems* (english language) - *Theory* - Guillaume DRION - *Control system design in time domain and frequency domain* - Guillaume DRION - [6h Labo.]	B1	Q1 26 -	6 20	- [+]		**5**

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) - 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	*Web and Text Analytics* (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) - - Suppl : Ljupcho GROZDANOVSKI	-	Q1	24	-	-	**5**
INFO8003-1	*Optimal decision making for complex problems* (english language) - Damien ERNST - [45h Proj.]	-	Q2	25	10	[+]	**5**
INFO8004-1	*Advanced Machine learning* (english language) - Pierre GEURTS, Gilles LOUPPE, Louis WEHENKEL - [45h 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 **Corequisite :** INFO9015-1 - Logic for Computer Science	-	Q2	24	20	-	**5**

Professional focus on "Management" (B1 : 15Cr, B2 : 15Cr)

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

Compulsory Courses

FINA0001-1	*Financial statement analysis and financing an enterprise* - Wouter TORSIN	B1	Q2	45	-	-	**5**
FINA0017-1	*General accounting (Evening classes)* - Anne BILS, Wilfried NIESSEN	B1	Q1	30	15	-	**5**
LOGI0010-1	*Supply Chain Management* (english language) - Yasemin ARDA	B1	Q2	45	-	-	**5**
ERAS0011-1	*Business Simulation* (english language) - Anne CHANTEUX - [50h Mon. WS]	B2	Q1	-	-	[+]	**2**
GRHO0001-4	*Strategic Human Resources Management* - François PICHAULT	B2	Q1	45	-	-	**5**
DROI2003-2	*Legal management of a company and its employees* - *Droit des sociétés* - Frédéric DAERDEN, Laurent STAS DE RICHELLE - *Droit fiscal* - Isabelle RICHELLE - [5h Conf.]	B2	Q2 25 25	- -	- [+]		**5**

Students choosing this focus shall select, in addition to 27 credits of compulsory courses, 28 credits of elective courses inside or outside 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, for 3 credits. 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. (B2 : 3Cr)

LANG1936-1	*Elementary Dutch 1* - Fanny NSITA	B2	TA	30	-	-	**3**
LANG1933-1	*Elementary German 1* - Marie MAWHIN	B2	Q2	30	-	-	**3**
LANG1934-1	*Elementary Spanish 1* - Alexis ALVAREZ BARBOSA	B2	TA	30	-	-	**3**

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) - Guy LEDUC - [12h Labo., 40h Proj.]	B1	Q1	35	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, Guy LEDUC - [12h Labo., 30h Proj.]	-	Q2	30	-	[+]	**5**
INFO0045-3	*Introduction to computer security* (english language) - Benoît DONNET - [10h Labo., 30h Proj.] **Corequisite :** INFO0902-1 - Structures des données et algorithmes INFO0012-2 - Computation structures INFO0010-4 - Introduction to computer networking	-	Q1	30	6	[+]	**5**
INFO0056-1	*Securing Networks* (english language) - Guy LEDUC - [12h Labo., 30h Proj.] (Even years) **Corequisite :** INFO0045-3 - Introduction to computer security INFO0010-4 - Introduction to computer networking	-	Q2	30	-	[+]	**5**
INFO0939-1	*High performance scientific computing* (english language) - Christophe GEUZAINE - [20h Proj.]	-	Q1	30	15	[+]	**5**
INFO8002-1	*Large-scale data systems* (english language) - Gilles LOUPPE - [45h Proj.]	-	Q1	25	10	[+]	**5**
INFO8012-1	*Digital Forensics* (english language) - [12h Labo., 30h Proj.] (Even years) **Prerequisite :** INFO0940-1 - Operating systems **Corequisite :** INFO0085-1 - Compilers INFO0010-4 - Introduction to computer networking	-	Q2	30	-	[+]	**5**
INFO8011-1	*Network infrastructures* (english language) - Benoît DONNET, Guy LEDUC, Laurent MATHY - [12h Labo., 30h Proj.] (Odd years) **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**
Intelligent Systems							
INFO8010-1	*Deep learning* (english language) - Gilles LOUPPE - [55h Proj.] **Corequisite :** ELEN0062-1 - Introduction to machine learning	-	Q2	25	10	[+]	**5**
ELEN0016-2	*Computer vision* (english language) - Marc VAN DROOGENBROECK - [50h Proj.]	-	Q1	30	10	[+]	**5**
INFO9015-1	*Logic for Computer Science* (english language) - Pascal FONTAINE	-	Q1	24	20	-	**5**
INFO0948-2	*Introduction to intelligent robotics* (english language) - Pierre SACRÉ - [80h Proj.]	-	Q2	30	4	[+]	**5**

	Corequisite : ELEN0062-1 - Introduction to machine learning ELEN0016-2 - Computer vision						
INFO2049-1	*Web and Text Analytics* (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	*Optimal decision making for complex problems* (english language) - Damien ERNST - [45h Proj.]	-	Q2	25	10	[+]	**5**
INFO8004-1	*Advanced Machine learning* (english language) - Pierre GEURTS, Gilles LOUPPE, Louis WEHENKEL - [45h 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 **Corequisite :** INFO9015-1 - Logic for Computer Science	-	Q2	24	20	-	**5**
Other optional courses							
INFO9015-1	*Logic for Computer Science* (english language) - Pascal FONTAINE	-	Q1	24	20	-	**5**
INFO9016-1	(pas organisé en 2021-2022) *Advanced Databases* (english language)	-	Q2	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**
INFO0060-1	*Concurrent system verification and temporal logic* (english language) - Bernard BOIGELOT - [20h Proj.] **Prerequisite :** INFO0016-1 - Introduction to the theory of computation **Corequisite :** INFO9015-1 - Logic for Computer Science	-	Q2	30	10	[+]	**5**
INFO0027-2	*Programming techniques* (english language) - *Algorithmics* - Laurent MATHY - [40h Proj.] - *Software patterns* - Laurent MATHY - [30h Proj.]	-	Q2 14 10	 14 10	 [+] [+]		**5**
GBIO0009-1	*Topics in bioinformatics* (english language) - Kristel VAN STEEN - [35h Proj.] **Prerequisite :** GBIO0002-1 - Genetics and bioinformatics	-	Q1	25	15	[+]	**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**
INGE0012-1	*Scientific research in engineering and its impact on innovation* (english language) - Rodolphe SEPULCHRE	-	Q2	26	26	-	**5**
MECA0524-1	*CAD & Geometric Algorithms* - Eric BÉCHET - [60h Proj.]	-	Q1	20	20	[+]	**5**
INFO0004-2	*Object-oriented programming projects* (english language) -	-	Q2	20	-	[+]	**5**

	MATHY - [90h Proj.]						
GBIO0031-1	*Learning from genomic data* (english language) - Kristel VAN STEEN - [150h Proj.]	-	Q2	-	-	[+]	**5**
[...]	With the agreement of the jury, choose 5 credits in any course programme of the University						

Internships and projects (maximum 15 credits)

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

Additional ECTS Master of science in computer science and engineering

Compulsory Courses (B0 : 46Cr)

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* - Céline ESSER - [5h Proj.]	B0	Q1	15	15	[+]	**3**
MATH0006-3	*Introduction to numerical analysis* (english language) - Quentin LOUVEAUX	B0	Q1	20	20	-	**4**
INFO0054-1	*Functional programming* - Christophe DEBRUYNE - [15h Proj.]	B0	Q1	28	24	[+]	**5**
MATH0488-1	*Elements of stochastic processes* - Maarten ARNST, Vincent DENOËL, Pierre GEURTS - [30h Proj.]	B0	Q2	10	10	[+]	**2**
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**
MATH0013-1	*Algebra* - Eric DELHEZ	B0	Q1	26	26	-	**5**
MECA0003-2	*Rational Mechanics* - Eric DELHEZ	B0	Q1	20	30	-	**4**
LANG6011-1	*Remedial English for Computer Science* (english language) - Adnan VESSEUR	B0	Q2	3	27	-	**3**
DROI0724-1	*Law and engineering* - Roman AYDOGDU, Christine BIQUET, Vanessa FRANSSEN, Fabienne KÉFER, Pascale LECOCQ, Bernard VANBRABANT, Cécile VERCHEVAL	B0	Q1	26	-	-	**2**
GENV0002-1	*Energy and sustainable development* - Pierre DEWALLEF, Damien ERNST, Nathalie JOB, Sigrid REITER - [20h Proj.]	B0	Q2	26	8	[+]	**3**
MATH0504-1	*Applied mathematics* - Benjamin DEWALS, Christophe GEUZAINE	B0	Q1	26	26	-	**5**