

**Vue cycle du programme des cours**

B1 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.

**Compulsory courses (B1 : 35Cr, B2 : 25Cr)**

INFO0085-1	<i>Compilers</i> (anglais) - Pascal FONTAINE - [75h Proj.] <b>Corequis :</b> INFO0016-1 - Introduction to the theory of computation INFO0902-1 - Structures des données et algorithmes INFO0012-2 - Computation structures INFO0940-1 - Operating systems	B1	Q2	25	-	[+]	5
ELEN0062-1	<i>Introduction to machine learning</i> (anglais) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B1	Q1	30	5	[+]	5
INFO0016-1	<i>Introduction to the theory of computation</i> (anglais) - Quentin LOUVEAUX	B1	Q1	26	26	-	5
ELEN0060-2	<i>Information and coding theory</i> (anglais) - Louis WEHENKEL - [30h Proj.]	B1	Q2	30	15	[+]	5
PROJ0010-1	<i>Software project engineering and management</i> (anglais) - Benoît DONNET, Bernard HAUZEUR, Guy LEDUC, Laurent MATHY - [280h Proj.] <b>Prérequis :</b> INFO0062-1 - Object-oriented programming <b>Corequis :</b> INFO0010-4 - Introduction to computer networking	B1	TA	20	-	[+]	10
GEST3162-1	<i>Principles of management</i> (anglais) - François PICHault, Willem STANDAERT - [25h Proj.]	B1	Q1	30	-	[+]	5
ATFE0002-1	<i>Master thesis</i> (anglais) - COLLÉGIALITÉ, Laurent MATHY - [750h Proj.]	B2	TA	-	-	[+]	25

**Optional courses (B1 : 25Cr, B2 : 35Cr)**

**Choose one focus among the three below : (B1 : 15Cr, B2 : 15Cr)**

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

Students choosing this focus shall select, in addition to 10 credits of compulsory courses, 50 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.

**Compulsory courses**

INFO0031-1	<i>Network Engineering</i> (anglais) - Benoît DONNET, Guy LEDUC - [12h Labo., 30h Proj.] <b>Corequis :</b> INFO0010-4 - Introduction to computer networking	B1	Q2	30	-	[+]	5
INFO0045-3	<i>Introduction to computer security</i> (anglais) - Benoît DONNET - [10h Labo., 30h Proj.] <b>Corequis :</b> INFO0902-1 - Structures des données et algorithmes INFO0010-4 - Introduction to computer networking	B1	Q1	30	6	[+]	5

**Choose 20 credits in the following list : (B1 : 5Cr, B2 : 15Cr)**

INFO0064-2	<i>Embedded systems</i> (anglais) - Bernard BOIGELOT	-	Q1	25	20	-	3
INFO2055-1	<i>Embedded systems project</i> (anglais) - Bernard BOIGELOT - [60h Proj.]	-	Q2	-	-	[+]	2

	<b>Corequis :</b> INFO0064-2 - Embedded systems							
INFO2051-1	<i>Object-oriented programming on mobile devices</i> (anglais) - Laurent MATHY - [90h Proj.]	-	Q1	15	10	[+]	5	
INFO0056-1	<i>Securing Networks</i> (anglais) - Guy LEDUC - [12h Labo., 30h Proj.] (années paires)	-	Q2	30	-	[+]	5	
	<b>Corequis :</b> INFO0045-3 - Introduction to computer security INFO0010-4 - Introduction to computer networking							
INFO0939-1	<i>High performance scientific computing</i> (anglais) - Christophe GEUZAINÉ - [20h Proj.]	-	Q1	30	15	[+]	5	
INFO8002-1	<i>Topics in Distributed Systems</i> (anglais) - Bernard BOIGÉLOT, Christophe DEBRUYNE, Pascal FONTAINE, Guy LEDUC, Laurent MATHY - [35h Proj.] (années impaires)	-	Q2	30	-	[+]	5	
INFO8012-1	<i>Digital Forensics</i> (anglais) - Benoît DONNET, Laurent MATHY - [12h Labo., 30h Proj.] (années paires)	-	Q2	30	-	[+]	5	
	<b>Corequis :</b> INFO0940-1 - Operating systems INFO0085-1 - Compilers INFO0010-4 - Introduction to computer networking							
INFO8011-1	<i>Network infrastructures</i> (anglais) - Benoît DONNET, Guy LEDUC, Laurent MATHY - [8h Labo., 30h Proj.]	-	Q1	30	-	[+]	5	
	<b>Corequis :</b> INFO0010-4 - Introduction to computer networking							
INFO8013-1	<i>Advanced Computer Security</i> (anglais) - Benoît DONNET, Laurent MATHY - [20h Labo., 30h Proj.] (années impaires)	-	Q2	20	-	[+]	5	
	<b>Corequis :</b> INFO0045-3 - Introduction to computer security							
INFO9016-1	<i>Advanced Databases</i> (anglais) - Christophe DEBRUYNE - [20h Proj.]	-	Q2	24	20	[+]	5	

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

Students choosing this focus shall select, in addition to 5 credits of compulsory courses, 55 credits of elective courses inside or outside the focus. However, for his/her whole master program (block 1 and block 2), a total of 25 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.

#### Compulsory courses

INFO8010-1	<i>Deep learning</i> (anglais) - Gilles LOUPPE - [60h Proj.]	B1	Q2	30	-	[+]	5	
Choose 25 credits in the following list : (B1 : 10Cr, B2 : 15Cr)								
ELEN0016-2	<i>Computer vision</i> (anglais) - Marc VAN DROOGENBROECK - [50h Proj.]	-	Q1	30	10	[+]	5	
INFO0948-2	<i>Introduction to intelligent robotics</i> (anglais) - Pierre SACRÉ - [80h Proj.]	-	Q2	30	4	[+]	5	
INFO2049-1	<i>Web and Text Analytics</i> (anglais) - Ashwin ITTOO	-	Q1	30	-	-	5	
GBIO0002-1	<i>Genetics and bioinformatics</i> (anglais) - Franck DEQUIEDT, Kristel VAN STEEN - [15h Proj.]	-	Q1	30	15	[+]	5	
DROI1357-1	<i>European law, (big) data and artificial intelligence applications seminar</i> (anglais) - - Suppl : Ljupcho GROZDANOVSKI	-	Q1	24	-	-	5	
INFO8003-1	<i>Optimal decision making for complex problems</i> (anglais) - Damien ERNST - [45h Proj.]	-	Q2	25	10	[+]	5	
INFO8004-1	<i>Advanced Machine learning</i> (anglais) - Pierre GEURTS,	-	Q2	25	-	[+]	5	

Louppe, Louis WEHENKEL - [20h Proj.]

INFO9014-1 *Knowledge representation and reasoning* (anglais) - Christophe DEBRUYNE - [45h Proj.] - Q2 24 20 [+] 5

**Corequis :**

INFO9015-1 - Logic for Computer Science

INFO9023-1 *Machine Learning Systems Design* (anglais) - Thomas VRANCKEN - [17h Labo., 18h Proj.] - Q2 17 - [+] 5

**Corequis :**

ELEN0062-1 - Introduction to machine learning

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

Students choosing this focus shall select, in addition to 27 credits of compulsory courses, 33 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.

**Students who intend to take the "Financial Engineering" focus in the Business Engineering Master, must take "GEST0832-4 Marchés Financiers", as the 5-credit free option course in this programme, prior to joining the Business Engineering Master.**

**Compulsory courses**

FINA0001-1 *Analyse des états financiers et financement de l'entreprise* - Wouter TORSIN B1 Q2 45 - - 5

TECH0763-2 *Technologies industrielles* - Sabine DANTHINE, Brigitte EVRARD, Angélique LÉONARD, Dominique TOYE B1 Q1 45 - - 5

LOGI0010-1 *Supply Chain Management* (anglais) - Yasemin ARDA B1 Q2 45 - - 5

ERAS0011-1 *Business Simulation* (anglais) - Anne CHANTEUX - [50h TD] B2 Q1 - - [+] 2

GRHO0001-4 *Gestion stratégique des ressources humaines* - François PICHAULT B2 Q1 45 - - 5

DROI2003-2 *Gestion juridique générale de l'entreprise* - Droit des sociétés - Laurent STAS DE RICHELLE - Droit fiscal - Isabelle RICHELLE - [5h Conf.] B2 Q2 25 - - 5  
25 - [+]

Choose one of the three following courses : (B2 : 3Cr)

LANG1936-1 *Néerlandais élémentaire 1* - Fanny NSITA B2 Q2 30 - - 3

LANG1933-1 *Allemand élémentaire 1* - Marie MAWHIN B2 TA 30 - - 3

LANG1934-1 *Espagnol élémentaire 1* - Alexis ALVAREZ BARBOSA, Alba BALLESTA MARTÍNEZ B2 TA 30 - - 3

Choose remaining credits in the lists below : (B1 : 10Cr, B2 : 20Cr)

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

**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 in computer science, or unless the corresponding knowledge and skills have been acquired previously (Are involved in these courses bachelors in "Informatique de gestion" and "Informatique et systèmes who must take these courses during the block 1").**

MATH0500-1 *Introduction à l'algorithmique numérique* - Quentin LOUVEAUX - [6h Labo., 45h Proj.] B1 Q1 24 14 [+] 5

INFO0902-1 *Structures des données et algorithmes* - Pierre GEURTS - [40h Proj.] B1 Q2 26 20 [+] 5

INFO0010-4 *Introduction to computer networking* (anglais) - Guy LEDUC - [12h Labo., 40h Proj.] B1 Q1 32 2 [+] 5

INFO0012-2	<i>Computation structures</i> (anglais) - Pascal FONTAINE, Laurent MATHY - [40h Proj.]	B1	Q1	26	26	[+]	5
INFO0940-1	<i>Operating systems</i> (anglais) - Laurent MATHY - [30h Proj.]	B1	Q2	30	6	[+]	5
INFO8006-1	<i>Introduction to artificial intelligence</i> (anglais) - Gilles LOUPPE - [45h Proj.]	B1	Q1	25	20	[+]	5
<b>Computer systems security</b>							
INFO0031-1	<i>Network Engineering</i> (anglais) - Benoît DONNET, Guy LEDUC - [12h Labo., 30h Proj.]	-	Q2	30	-	[+]	5
INFO0045-3	<i>Introduction to computer security</i> (anglais) - Benoît DONNET - [10h Labo., 30h Proj.] <b>Corequis :</b> INFO0902-1 - Structures des données et algorithmes INFO0012-2 - Computation structures INFO0010-4 - Introduction to computer networking	-	Q1	30	6	[+]	5
INFO0056-1	<i>Securing Networks</i> (anglais) - Guy LEDUC - [12h Labo., 30h Proj.] (années paires) <b>Corequis :</b> INFO0045-3 - Introduction to computer security INFO0010-4 - Introduction to computer networking	-	Q2	30	-	[+]	5
INFO0939-1	<i>High performance scientific computing</i> (anglais) - Christophe GEUZAIN - [20h Proj.]	-	Q1	30	15	[+]	5
INFO8002-1	<i>Topics in Distributed Systems</i> (anglais) - Bernard BOIGELOT, Christophe DEBRUYNE, Pascal FONTAINE, Guy LEDUC, Laurent MATHY - [35h Proj.] (années impaires)	-	Q2	30	-	[+]	5
INFO8012-1	<i>Digital Forensics</i> (anglais) - Benoît DONNET, Laurent MATHY - [12h Labo., 30h Proj.] (années paires) <b>Corequis :</b> INFO0085-1 - Compilers INFO0010-4 - Introduction to computer networking INFO0940-1 - Operating systems	-	Q2	30	-	[+]	5
INFO8011-1	<i>Network infrastructures</i> (anglais) - Benoît DONNET, Guy LEDUC, Laurent MATHY - [8h Labo., 30h Proj.] <b>Corequis :</b> INFO0010-4 - Introduction to computer networking	-	Q1	30	-	[+]	5
INFO8013-1	<i>Advanced Computer Security</i> (anglais) - Benoît DONNET, Laurent MATHY - [20h Labo., 30h Proj.] (années impaires) <b>Corequis :</b> INFO0045-3 - Introduction to computer security	-	Q2	20	-	[+]	5
<b>Intelligent Systems</b>							
INFO8010-1	<i>Deep learning</i> (anglais) - Gilles LOUPPE - [60h Proj.] <b>Corequis :</b> ELEN0062-1 - Introduction to machine learning	-	Q2	30	-	[+]	5
ELEN0016-2	<i>Computer vision</i> (anglais) - Marc VAN DROOGENBROECK - [50h Proj.]	-	Q1	30	10	[+]	5
INFO0948-2	<i>Introduction to intelligent robotics</i> (anglais) - Pierre SACRÉ - [80h Proj.]	-	Q2	30	4	[+]	5
INFO9015-1	<i>Logic for Computer Science</i> (anglais) - Pascal FONTAINE	-	Q1	24	20	-	5
INFO2049-1	<i>Web and Text Analytics</i> (anglais) - Ashwin ITTOO <b>Corequis :</b> ELEN0062-1 - Introduction to machine learning	-	Q1	30	-	-	5
GBIO0002-1	<i>Genetics and bioinformatics</i> (anglais) - Franck DEQUIEDT, Kristel VAN STEEN - [15h Proj.]	-	Q1	30	15	[+]	5

INFO8004-1	<i>Advanced Machine learning</i> (anglais) - Pierre GEURTS, Gilles LOUPPE, Louis WEHENKEL - [20h Proj.] <b>Corequis :</b> ELEN0062-1 - Introduction to machine learning INFO8010-1 - Deep learning	-	Q2	25	-	[+]	5
INFO9014-1	<i>Knowledge representation and reasoning</i> (anglais) - Christophe DEBRUYNE - [45h Proj.] <b>Corequis :</b> INFO9015-1 - Logic for Computer Science	-	Q2	24	20	[+]	5
<b>Other optional courses</b>							
INFO2051-1	<i>Object-oriented programming on mobile devices</i> (anglais) - Laurent MATHY - [90h Proj.]	-	Q1	15	10	[+]	5
INFO0064-2	<i>Embedded systems</i> (anglais) - Bernard BOIGELOT	-	Q1	25	20	-	3
INFO2055-1	<i>Embedded systems project</i> (anglais) - Bernard BOIGELOT - [60h Proj.] <b>Corequis :</b> INFO0064-2 - Embedded systems	-	Q2	-	-	[+]	2
INFO0060-1	<i>Introduction to computer systems verification</i> (anglais) - Bernard BOIGELOT, Pascal FONTAINE - [20h Proj.] <b>Corequis :</b> INFO0016-1 - Introduction to the theory of computation INFO9015-1 - Logic for Computer Science	-	Q2	20	20	[+]	5
MECA0524-1	<i>CAD &amp; Geometric Algorithms</i> - Eric BÉCHET - [60h Proj.]	-	Q1	20	20	[+]	5
GBIO0009-1	<i>Topics in bioinformatics</i> (anglais) - Kristel VAN STEEN - [35h Proj.] <b>Prérequis :</b> GBIO0002-1 - Genetics and bioinformatics	-	Q1	25	15	[+]	5
MATH0461-2	<i>Introduction to numerical optimization</i> (anglais) - Quentin LOUVEAUX - [25h Proj.]	-	Q1	30	20	[+]	5
MATH0462-1	<i>Discrete optimization</i> (anglais) - Quentin LOUVEAUX - [25h Proj.] <b>Corequis :</b> MATH0500-1 - Introduction à l'algorithmique numérique	-	Q2	30	20	[+]	5
GBIO0030-1	<i>Computational approaches to statistical genetics</i> (anglais) - Kristel VAN STEEN - [35h Proj.] <b>Prérequis :</b> GBIO0002-1 - Genetics and bioinformatics	-	Q2	25	15	[+]	5
GBIO0031-1	<i>Learning from genomic data</i> (anglais) - Kristel VAN STEEN - [150h Proj.] <b>Prérequis :</b> GBIO0002-1 - Genetics and bioinformatics	-	Q2	-	-	[+]	5
INFO9012-1	<i>Parallel Programming</i> (anglais) - Pascal FONTAINE	-	Q2	25	25	-	5
INFO9015-1	<i>Logic for Computer Science</i> (anglais) - Pascal FONTAINE	-	Q1	24	20	-	5
INFO9016-1	<i>Advanced Databases</i> (anglais) - Christophe DEBRUYNE - [20h Proj.]	-	Q2	24	20	[+]	5
INFO9023-1	<i>Machine Learning Systems Design</i> (anglais) - Thomas VRANCKEN - [17h Labo., 18h Proj.] <b>Corequis :</b> ELEN0062-1 - Introduction to machine learning	-	Q2	17	-	[+]	5
<b>Internships and projects (maximum 15 credits)</b>							
ASTG9005-1	<i>Research Internship</i> (anglais) - Benoît DONNET - [300h Proj.] <b>Prérequis :</b> PROJ0010-1 - Software project engineering and management	B2	TA	-	-	[+]	10
ASTG0021-1	<i>Technical company internship</i> (anglais) - Laurent MATHY - [300h Proj.]	B2	TA	-	-	[+]	10

**Prérequis :**

PROJ0010-1 - Software project engineering and management

*Remarque :* the two company internships are mutually exclusive

PROJ0011-1	<i>Personal student project</i> (anglais) - Bernard BOIGELOT, COLLÉGIALITÉ - [150h Proj.]	B2	TA	-	-	[+]	5
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## Crédits supplémentaires Master en sciences informatiques (pour les étudiants qui n'ont pas obtenu un Bachelier en sciences informatiques)

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

### Compulsory courses (B0 : 27Cr)

INFO9012-1	<i>Parallel Programming</i> (anglais) - Pascal FONTAINE	B0	Q2	25	25	-	5
INFO0062-1	<i>Object-oriented programming</i> (anglais) - Bernard BOIGELOT - [20h Proj.]	B0	Q2	25	20	[+]	5
INFO0054-1	<i>Programmation fonctionnelle</i> - Christophe DEBRUYNE - [20h Proj.]	B0	Q1	24	24	[+]	5
MATH2019-1	<i>Mathématiques pour l'informatique 1</i> - Emilie CHARLIER	B0	Q1	26	26	-	5
INFO0027-3	<i>Programming techniques, Software patterns</i> (anglais) - Laurent MATHY - [30h Proj.]	B0	Q2	10	10	[+]	2
MATH0495-1	<i>Eléments du calcul des probabilités</i> - Laurent LOOSVELDT - [5h Proj.]	B0	Q1	26	26	[+]	5

### Optional courses (B0 : 3Cr)

Students who pass the entrance test may replace LANG6011-1 with the advanced course LANG0988-1 "Advanced for ICT studies". (B0 : 3Cr)

LANG6011-1	<i>Remedial English for Computer Science</i> (anglais) - Adnan VESSEUR	B0	Q2	3	27	-	3
LANG0988-1	<i>Advanced English for ICT studies</i> (anglais) - Adnan VESSEUR	B0	Q1	5	25	-	3

## Crédits supplémentaires Master en sciences informatiques (destinés aux bacheliers Hautes Ecoles en sciences informatiques)

### Compulsory courses (B0 : 57Cr)

MATH0500-1	<i>Introduction à l'algorithmique numérique</i> - Quentin LOUVEAUX - [6h Labo., 45h Proj.]	B0	Q1	24	14	[+]	5
INFO0902-1	<i>Structures des données et algorithmes</i> - Pierre GEURTS - [40h Proj.]	B0	Q2	26	20	[+]	5
INFO9012-1	<i>Parallel Programming</i> (anglais) - Pascal FONTAINE	B0	Q2	25	25	-	5
INFO0010-4	<i>Introduction to computer networking</i> (anglais) - Guy LEDUC - [12h Labo., 40h Proj.]	B0	Q1	32	2	[+]	5
INFO0012-2	<i>Computation structures</i> (anglais) - Pascal FONTAINE, Laurent MATHY - [40h Proj.]	B0	Q1	26	26	[+]	5
INFO0940-1	<i>Operating systems</i> (anglais) - Laurent MATHY - [30h Proj.]	B0	Q2	30	6	[+]	5
INFO0062-1	<i>Object-oriented programming</i> (anglais) - Bernard BOIGELOT - [20h Proj.]	B0	Q2	25	20	[+]	5



INFO0054-1	<i>Programmation fonctionnelle</i> - Christophe DEBRUYNE - [20h Proj.]	B0	Q1	24	24	[+]	<b>5</b>
MATH2019-1	<i>Mathématiques pour l'informatique 1</i> - Emilie CHARLIER	B0	Q1	26	26	-	<b>5</b>
INFO0027-3	<i>Programming techniques, Software patterns</i> (anglais) - Laurent MATHY - [30h Proj.]	B0	Q2	10	10	[+]	<b>2</b>
MATH0495-1	<i>Eléments du calcul des probabilités</i> - Laurent LOOSVELDT - [5h Proj.]	B0	Q1	26	26	[+]	<b>5</b>
INFO8006-1	<i>Introduction to artificial intelligence</i> (anglais) - Gilles LOUPPE - [45h Proj.]	B0	Q1	25	20	[+]	<b>5</b>

**Optional courses (B0 : 3Cr)**

Students who pass the entrance test may replace LANG6011-1 with the advanced course LANG0988-1 "Advanced for ICT studies". (B0 : 3Cr)

LANG6011-1	<i>Remedial English for Computer Science</i> (anglais) - Adnan VESSEUR	B0	Q2	3	27	-	<b>3</b>
LANG0988-1	<i>Advanced English for ICT studies</i> (anglais) - Adnan VESSEUR	B0	Q1	5	25	-	<b>3</b>