Cycle view of the study programme

		Bl	Or	Th	Pr	Au	Cr

If one or several of the mandatory courses have already been credited when entering the Master of Data science program, they can be replaced by a corresponding amount of credits chosen among the elective courses.

Compulsory Courses (B1 : 20Cr, B2 : 35Cr)

Computer Science, Applied Mathematics and Data Science fundamentals :

INFO0016-1	*Introduction to the theory of computation* (english language) - Quentin LOUVEAUX	B1	Q1	26	26	-	**5**
MATH0461-2	*Introduction to numerical optimization* (english language) - Quentin LOUVEAUX - [25h Proj.]	B1	Q1	30	20	[+]	**5**
ELEN0060-2	*Information and coding theory* (english language) - Louis WEHENKEL - [30h Proj.]	B1	Q2	30	15	[+]	**5**
ELEN0062-1	*Introduction to machine learning* (english language) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B1	Q1	30	5	[+]	**5**

Master thesis

ATFE9009-1	*Master thesis* (english language) - Pierre GEURTS - [750h Proj.]	B2	TA	-	-	[+]	**25**

Management and legal issues

DROI1357-1	*European law, (big) data and artificial intelligence applications seminar* (english language) - - Suppl : Ljupcho GROZDANOVSKI	B2	Q1	24	-	-	**5**
GEST3162-1	*Principles of management* (english language) - François PICHAULT, Willem STANDAERT - [25h Proj.]	B2	Q1	30	-	[+]	**5**

[...] Students who have already acquired the skills and knowledge of GEST3162 (or equivalent) will replace it by a course of their choice of 5 ECTS

Elective courses (B1 : 40Cr, B2 : 25Cr)

Single focus (B1 : 30Cr)

Professional focus in data science (B1 : 30Cr)

MATH2021-1	*High-dimensional data analysis* (english language) - Gentiane HAESBROECK - [30h Proj.]	B1	Q1	30	15	[+]	**5**
INFO8002-1	*Large-scale data systems* (english language) - Gilles LOUPPE - [45h Proj.]	B1	Q1	25	10	[+]	**5**
PROJ0016-1	*Big data project* (english language) - Bertrand CORNÉLUSSE, Pierre GEURTS, Gilles LOUPPE, Gilles LOUPPE - [180h Proj.] **Corequisite :** INFO8006-1 - Introduction to artificial intelligence	B1	TA	25	-	[+]	**10**
INFO9014-1	*Knowledge representation and reasoning* (english language) - Christophe DEBRUYNE	B1	Q2	24	20	-	**5**
INFO8010-1	*Deep learning* (english language) - Gilles LOUPPE - [55h Proj.]	B1	Q2	25	10	[+]	**5**

Choose 10 credits in the following list among those that have not already been credited before entering the Master programme: (B1 : 10Cr)

INFO8006-1	*Introduction to artificial intelligence* (english language) - Gilles LOUPPE - [45h Proj.]	B1	Q1	25	20	[+]	**5**
INFO8003-1	*Optimal decision making for complex problems* (english language) - Damien ERNST - [45h Proj.]	B1	Q2	25	10	[+]	**5**
INFO8004-1	*Advanced Machine learning* (english language) - Pierre GEURTS, Gilles LOUPPE, Louis WEHENKEL - [45h Proj.]	B1	Q2	25	-	[+]	**5**
INFO2049-1	*Web and Text Analytics* (english language) - Ashwin ITTOO	B1	Q1	30	-	-	**5**
ELEN0016-2	*Computer vision* (english language) - Marc VAN DROOGENBROECK -	B1	Q1	30	10	[+]	**5**

	[50h Proj.]						
INFO0948-2	*Introduction to intelligent robotics* (english language) - Pierre SACRÉ - [80h Proj.]	B1	Q2	30	4	[+]	**5**
PROJ0017-1	*Personal student project in Data Science* (english language) - Pierre GEURTS, Gilles LOUPPE - [150h Proj.]	B1	TA	-	-	[+]	**5**
INFO9015-1	*Logic for Computer Science* (english language) - Pascal FONTAINE	B1	Q1	24	20	-	**5**
INFO0027-2	*Programming techniques* (english language) - *Algorithmics* - Laurent MATHY - [40h Proj.] - *Software patterns* - Laurent MATHY - [30h Proj.]	B1	Q2 14 10	 14 10	 [+] [+]		**5**
INFO0010-4	*Introduction to computer networking* (english language) - Guy LEDUC - [12h Labo., 40h Proj.]	B1	Q1	35	2	[+]	**5**
INFO0940-1	*Operating systems* (english language) - Laurent MATHY - [30h Proj.]	B1	Q2	30	6	[+]	**5**
INFO0045-3	*Introduction to computer security* (english language) - Benoît DONNET - [10h Labo., 30h Proj.]	B1	Q1	30	6	[+]	**5**
INFO8011-1	*Network infrastructures* (english language) - Benoît DONNET, Guy LEDUC, Laurent MATHY - [12h Labo., 30h Proj.] (Odd years)	B1	Q1	30	-	[+]	**5**

Choose 25 credits in the following topics, among those that have not already been credited in Block 1 or before entering this Master programme: (B2 : 25Cr)

Elective courses in Data Science and Artificial Intelligence

INFO8004-1	*Advanced Machine learning* (english language) - Pierre GEURTS, Gilles LOUPPE, Louis WEHENKEL - [45h Proj.]	B2	Q2	25	-	[+]	**5**
INFO2049-1	*Web and Text Analytics* (english language) - Ashwin ITTOO	B2	Q1	30	-	-	**5**
GEST5006-1	*SAS Certification applied analytics* (english language) - Michael SCHYNS	B2	Q2	15	25	-	**5**
MATH2022-1	*Large sample analysis : theory and practice* (english language) - *General course* - Arnout VAN MESSEM - [10h Proj.] - *Project complement* - Arnout VAN MESSEM - [30h Proj.]	B2	Q2 24 -	 12 -	 [+] [+]		**5**
INFO8003-1	*Optimal decision making for complex problems* (english language) - Damien ERNST - [45h Proj.]	B2	Q2	25	10	[+]	**5**
ELEN0016-2	*Computer vision* (english language) - Marc VAN DROOGENBROECK - [50h Proj.]	B2	Q1	30	10	[+]	**5**
INFO0948-2	*Introduction to intelligent robotics* (english language) - Pierre SACRÉ - [80h Proj.]	B2	Q2	30	4	[+]	**5**

Elective courses in Computer Science and Applied Mathematics

INFO0027-2	*Programming techniques* (english language) - *Algorithmics* - Laurent MATHY - [40h Proj.] - *Software patterns* - Laurent MATHY - [30h Proj.]	B2	Q2 14 10	 14 10	 [+] [+]		**5**
INFO0939-1	*High performance scientific computing* (english language) - Christophe GEUZAINE - [20h Proj.]	B2	Q1	30	15	[+]	**5**
INFO0010-4	*Introduction to computer networking* (english language) - Guy LEDUC - [12h Labo., 40h Proj.]	B2	Q1	35	2	[+]	**5**
INFO0940-1	*Operating systems* (english language) - Laurent MATHY - [30h Proj.]	B2	Q2	30	6	[+]	**5**
INFO0045-3	*Introduction to computer security* (english language) - Benoît DONNET - [10h Labo., 30h Proj.]	B2	Q1	30	6	[+]	**5**
INFO8011-1	*Network infrastructures* (english language) - Benoît DONNET, Guy LEDUC, Laurent MATHY - [12h Labo., 30h Proj.] (Odd years)	B2	Q1	30	-	[+]	**5**
MATH0462-1	*Discrete optimization* (english language) - Quentin LOUVEAUX - [25h Proj.]	B2	Q2	30	20	[+]	**5**

MQGE0002-3	*Computational Optimization* (english language) - Yves CRAMA	B2	Q2	30	-	-	**5**
INFO9015-1	*Logic for Computer Science* (english language) - Pascal FONTAINE	B2	Q1	24	20	-	**5**

Elective courses in bioinformatics

GBIO0002-1	*Genetics and bioinformatics* (english language) - Franck DEQUIEDT, Kristel VAN STEEN - [15h Proj.]	B2	Q1	30	15	[+]	**5**
GBIO0009-1	*Topics in bioinformatics* (english language) - Kristel VAN STEEN - [35h Proj.]	B2	Q1	25	15	[+]	**5**
GBIO0030-1	*Computational approaches to statistical generics* (english language) - Kristel VAN STEEN - [35h Proj.]	B2	Q2	25	15	[+]	**5**

Elective courses in management

GEST3032-1	*eBusiness and eCommerce* (english language) - Ashwin ITTOO	B2	Q1	30	-	-	**5**

Optional company internships

Notice : the course units ASTG9008-1 and ASTG9009-1 are mutually exclusive

ASTG9008-1	*Internship (coupled with Master thesis)* (english language) - Pierre GEURTS - [80d FW]	B2	TA	-	-	[+]	**5**
ASTG9009-1	*Internship (independent of Master thesis)* - Pierre GEURTS - [40d FW]	B2	TA	-	-	[+]	**10**

Miscellaneous

INGE0012-1	*Scientific research in engineering and its impact on innovation* (english language) - Rodolphe SEPULCHRE	B2	Q2	26	26	-	**5**

[...] With the agreement of the President of the Jury, students may also choose up to 15 credits in the application area of their Master thesis in other programmes of the university

[...] With the agreement of the President of the Jury, students may also choose 5 credits in any other programme of the university.

Extra credits Master in Data Science and Engineering (120 ECTS)

Optional courses (B0 : 47Cr)

Students who are admitted to this master without having acquired equivalent courses must add them to the programme of their first year. (B0 : 47Cr)

1. Basic courses of a bachelor degree of science in engineering, including courses equivalent to :

MATH0002-4	*Mathematical analysis 1* - Eric DELHEZ	B0	Q1	22	22	-	**4**
MATH0013-1	*Algebra* - Eric DELHEZ	B0	Q1	26	26	-	**5**
MATH0062-1	*Elements of probability calculus* - Pierre SACRÉ - [25h Proj.]	B0	Q2	15	10	[+]	**3**
MATH0487-2	*Elements of statistics* - Pierre SACRÉ - [25h Proj.]	B0	Q1	15	10	[+]	**3**
MATH0488-1	*Elements of stochastic processes* - Maarten ARNST, Vincent DENOËL, Pierre GEURTS - [30h Proj.]	B0	Q2	10	10	[+]	**2**
INFO2009-2	*Introduction to computer science* - Bernard BOIGELOT	B0	Q1	24	14	-	**4**
MATH0006-3	*Introduction to numerical analysis* (english language) - Quentin LOUVEAUX	B0	Q1	20	20	-	**4**
MECA0003-2	*Rational Mechanics* - Eric DELHEZ	B0	Q1	20	30	-	**4**
SYST0002-2	*Introduction to signals and systems* - Guillaume DRION - [15h Proj.]	B0	Q1	26	26	[+]	**5**

2. Additional courses in computer science :

INFO0902-1	*Data structures and algorithms* - Pierre GEURTS - [40h Proj.]	B0	Q2	26	20	[+]	**5**
INFO0009-2	*Database (general organisation)* - Christophe DEBRUYNE - [25h Proj.]	B0	Q2	26	26	[+]	**5**
INFO8006-1	*Introduction to artificial intelligence* (english language) - Gilles LOUPPE - [45h Proj.]	B0	Q1	25	20	[+]	**5**

3. A level B2 in English.