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 : 40Cr)

Computer Science, Applied Mathematics and Data Science fundamentals :

INFO0016-1	*Introduction to the theory of computation* (english language) - Pierre WOLPER	B1	Q1	26	26	-	**5**
MATH0461-2	*Introduction to numerical optimization* (english language) - Quentin LOUVEAUX - [25h Proj.]	B1	Q1	30	20	[+]	**5**
INFO8006-1	*Introduction to artificial intelligence* (english language) - Gilles LOUPPE - [45h Proj.]	B1	Q1	25	10	[+]	**5**
ELEN0062-1	*Introduction to machine learning* (english language) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.]	B1	Q1	30	5	[+]	**5**

Management and legal issues

GEST3162-1	*Principles of management* (english language) - Michael GHILISSEN, François PICHAULT	B2	Q1	25	25	-	**5**
DROI8031-2	*Introduction to the law of robots, Law of artificial intelligence, robots and data-driven Algorithmic Applications* (english language) - Nicolas PETIT	B2	Q1	20	-	-	**5**

Notice : students who have already acquired the skills and knowledge of GEST3162 (or equivalent) will replace it by GEST3032 (see options below).

Master thesis

ATFE9009-1	*Master thesis and internship* (english language) - Pierre GEURTS	B2	TA	-	-	-	**30**

Elective courses (B1 : 40Cr, B2 : 20Cr)

Single focus (B1 : 30Cr)

Professional focus in data science (B1 : 30Cr)

MATH2021-1	*High-dimensional data analysis* (english language) - Gentiane HAESBROECK - [10h Labo., 15h Proj.]	B1	Q1	15	-	[+]	**3**
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 - [180h Proj.]	B1	TA	10	-	[+]	**7**
ELEN0060-2	*Information and coding theory* (english language) - Louis WEHENKEL - [30h Proj.]	B1	Q2	30	15	[+]	**5**
INFO8005-1	*Semantic Data* (english language) - JeanLouis BINOT - [45h Proj.]	B1	Q2	25	10	[+]	**5**
INFO8010-1	*Deep learning* (english language) - Gilles LOUPPE - [45h Proj.]	B1	Q2	30	5	[+]	**5**

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

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	30	5	[+]	**5**
INFO2049-1	*Web and Text Analytics* (english language) - Ashwin ITTOO	B1	Q1	30	-	-	**5**
ELEN0016-2	*Computer vision* (english language) - Marc VAN DROOGENBROECK - [50h Proj.]	B1	Q1	30	10	[+]	**5**

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**
INFO0051-1	*Logic* (english language) - Pascal GRIBOMONT - [10h Proj.]	B1	Q1	25	25	[+]	**5**
INFO0049-1	*Knowledge representation* (english language) - Pascal GRIBOMONT - [50h Proj.]	B1	Q2	28	24	[+]	**5**
INFO0027-2	*Programming techniques* (english language) - Laurent MATHY - [70h Proj.]	B1	Q2	24	24	[+]	**5**
INFO0010-4	*Introduction to computer networking* (english language) - *Part A* - Guy LEDUC - [8h Labo., 40h Proj.] - *Part B* - Guy LEDUC - [4h Labo.]	B1	Q2 30 5	 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 - [8h Labo., 30h Proj.]	B1	Q1	30	10	[+]	**5**
INFO8011-1	(pas organisé en 2018-2019) *Network infrastructures* - Benoît DONNET, Guy LEDUC, Laurent MATHY - [12h Labo., 30h Proj.] (Odd years)	B1	Q2	30	-	[+]	**5**

Choose 20 credits in the following topics, among those that have not already been credited in Block 1 or before entering this Master programme: (B2 : 20Cr)

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	30	5	[+]	**5**
INFO2049-1	*Web and Text Analytics* (english language) - Ashwin ITTOO	B2	Q1	30	-	-	**5**
MATH2022-1	*Large sample analysis : theory and practice* (english language) - *General course* - N..., Yvik SWAN - [10h Proj.] - *Project complement* - N..., Yvik SWAN - [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**
INFO0049-1	*Knowledge representation* (english language) - Pascal GRIBOMONT - [50h Proj.]	B2	Q2	28	24	[+]	**5**
GEST5006-1	*SAS Certification applied analytics* (english language) - Michael SCHYNS - [25h Mon. WS]	B2	Q2	15	-	[+]	**5**

Elective courses in Computer Science and Applied Mathematics

INFO0027-2	*Programming techniques* (english language) - Laurent MATHY - [70h Proj.]	B2	Q2	24	24	[+]	**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) - *Part A* - Guy LEDUC - [8h Labo., 40h Proj.] - *Part B* - Guy LEDUC - [4h Labo.]	B2	Q2 30 5	 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 - [8h Labo., 30h Proj.]	B2	Q1	30	10	[+]	**5**

INFO8011-1	(pas organisé en 2018-2019) *Network infrastructures* - Benoît DONNET, Guy LEDUC, Laurent MATHY - [12h Labo., 30h Proj.] (Odd years)	B2	Q2	30	-	[+]	**5**
MATH0462-1	*Discrete optimization* (english language) - Quentin LOUVEAUX - [25h Proj.]	B2	Q1	30	20	[+]	**5**
MQGE0002-3	*Computational Optimization* (english language) - Yves CRAMA	B2	Q2	30	-	-	**5**
INFO0051-1	*Logic* (english language) - Pascal GRIBOMONT - [10h Proj.]	B2	Q1	25	25	[+]	**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**

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 : 57Cr)

Students who are admitted to this master without having acquired equivalent courses must add them to the programme of their first year. (B0 : 57Cr)

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**
MATH0003-1	*Geometry*	B0	Q2	25	15	-	**3**
MATH0013-1	*Algebra* - Eric DELHEZ	B0	Q1	26	26	-	**5**
MATH0062-1	*Elements of probability calculus* - Louis WEHENKEL - Suppl : Adrien DELIÈGE - [25h Proj.]	B0	Q2	15	10	[+]	**3**
MATH0487-2	*Elements of statistics* - Louis WEHENKEL - [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 - [8h Labo.]	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)* - Pierre WOLPER - Suppl : Samuel HIARD - [25h Proj.]	B0	Q2	26	26	[+]	**5**
INFO0054-1	*Functional programming* - Pascal GRIBOMONT - [15h Proj.]	B0	Q2	28	24	[+]	**5**
INFO0062-1	*Object-oriented programming* (english language) - Bernard BOIGELOT - [20h Proj.]	B0	Q2	25	20	[+]	**5**

3. Students must have a level B2 in English.