Vue bloc du programme des cours

		Or	Th	Pr	Au	Cr

Bloc 1

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

Computer Science, Applied Mathematics and Data Science fundamentals :

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

Elective courses

Single focus

Professional focus in data science

MATH2021-1	*High-dimensional data analysis* (anglais) - Gentiane HAESBROECK - [30h Proj.]	Q1	30	15	[+]	**5**
INFO8002-1	*Large-scale data systems* (anglais) - Gilles LOUPPE - [45h Proj.]	Q1	25	10	[+]	**5**
PROJ0016-1	*Big data project* (anglais) - Bertrand CORNÉLUSSE, Pierre GEURTS, Gilles LOUPPE - [180h Proj.] **Corequis :** INFO8006-1 - Introduction to artificial intelligence	TA	25	-	[+]	**10**
INFO8005-1	*Semantic Data* (anglais) - - Suppl : JeanLouis BINOT - [45h Proj.]	Q2	25	10	[+]	**5**
INFO8010-1	*Deep learning* (anglais) - Gilles LOUPPE - [55h Proj.]	Q2	25	10	[+]	**5**

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

Remarque : INFO8006-1 is corequisite to compulsory course of the master program and must be taken as a priority, unless it was already taken as part of the bachelor or unless the corresponding knowledge and skills have been acquired previously.

INFO8006-1	*Introduction to artificial intelligence* (anglais) - Gilles LOUPPE - [45h Proj.]	Q1	25	20	[+]	**5**
INFO8003-1	*Optimal decision making for complex problems* (anglais) - Damien ERNST - [45h Proj.]	Q2	25	10	[+]	**5**
INFO8004-1	*Advanced Machine learning* (anglais) - Pierre GEURTS, Gilles LOUPPE, Louis WEHENKEL - [45h Proj.]	Q2	25	-	[+]	**5**
INFO2049-1	*Web and Text Analytics* (anglais) - Ashwin ITTOO	Q1	30	-	-	**5**
ELEN0016-2	*Computer vision* (anglais) - Marc VAN DROOGENBROECK - [50h Proj.]	Q1	30	10	[+]	**5**
INFO0948-2	*Introduction to intelligent robotics* (anglais) - Pierre SACRÉ - [80h Proj.]	Q2	30	4	[+]	**5**
PROJ0017-1	*Personal student project in Data Science* (anglais) - Pierre GEURTS, Gilles LOUPPE - [150h Proj.]	TA	-	-	[+]	**5**
INFO0051-1	*Logic* (anglais) - Pascal GRIBOMONT - [10h Proj.]	Q1	25	25	[+]	**5**
INFO0049-1	*Knowledge representation* (anglais) - Pascal GRIBOMONT - [50h Proj.]	Q2	28	4	[+]	**5**
INFO0027-2	*Programming techniques* (anglais) - Laurent MATHY - [70h Proj.]	Q2	24	24	[+]	**5**
INFO0010-4	*Introduction to computer networking* (anglais) - Guy LEDUC - [12h Labo., 40h Proj.]	Q1	35	2	[+]	**5**

INFO0940-1	*Operating systems* (anglais) - Laurent MATHY - [30h Proj.]	Q2	30	6	[+]	**5**
INFO0045-3	*Introduction to computer security* (anglais) - Benoît DONNET - [10h Labo., 30h Proj.]	Q1	30	6	[+]	**5**
INFO8011-1	*Network infrastructures* (anglais) - Benoît DONNET, Guy LEDUC, Laurent MATHY - [12h Labo., 30h Proj.] (années impaires)	Q1	30	-	[+]	**5**

Bloc 2

Compulsory courses

Master thesis

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

Management and legal issues

DROI1357-1	*European law, (big) data and artificial intelligence applications seminar* (anglais) - Pieter VAN CLEYNENBREUGEL	Q1	24	-	-	**5**
GEST3162-1	*Principles of management* (anglais) - Michael GHILISSEN, François PICHAULT	Q1	25	25	-	**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

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

Elective courses in Data Science and Artificial Intelligence

INFO8004-1	*Advanced Machine learning* (anglais) - Pierre GEURTS, Gilles LOUPPE, Louis WEHENKEL - [45h Proj.]	Q2	25	-	[+]	**5**
INFO2049-1	*Web and Text Analytics* (anglais) - Ashwin ITTOO	Q1	30	-	-	**5**
MATH2022-1	*Large sample analysis : theory and practice* (anglais) - *General course* - Arnout VAN MESSEM - [10h Proj.] - *Project complement* - Arnout VAN MESSEM - [30h Proj.]	Q2	 24 -	 12 -	 [+] [+]	**5**
INFO8003-1	*Optimal decision making for complex problems* (anglais) - Damien ERNST - [45h Proj.]	Q2	25	10	[+]	**5**
ELEN0016-2	*Computer vision* (anglais) - Marc VAN DROOGENBROECK - [50h Proj.]	Q1	30	10	[+]	**5**
INFO0948-2	*Introduction to intelligent robotics* (anglais) - Pierre SACRÉ - [80h Proj.]	Q2	30	4	[+]	**5**
INFO0049-1	*Knowledge representation* (anglais) - Pascal GRIBOMONT - [50h Proj.]	Q2	28	4	[+]	**5**
GEST5006-1	*SAS Certification applied analytics* (anglais) - Michael SCHYNS - [25h TD]	Q2	15	-	[+]	**5**

Elective courses in Computer Science and Applied Mathematics

INFO0027-2	*Programming techniques* (anglais) - Laurent MATHY - [70h Proj.]	Q2	24	24	[+]	**5**
INFO0939-1	*High performance scientific computing* (anglais) - Christophe GEUZAINE - [20h Proj.]	Q1	30	15	[+]	**5**
INFO0010-4	*Introduction to computer networking* (anglais) - Guy LEDUC - [12h Labo., 40h Proj.]	Q1	35	2	[+]	**5**
INFO0940-1	*Operating systems* (anglais) - Laurent MATHY - [30h Proj.]	Q2	30	6	[+]	**5**
INFO0045-3	*Introduction to computer security* (anglais) - Benoît DONNET - [10h Labo., 30h Proj.]	Q1	30	6	[+]	**5**
INFO8011-1	(pas organisé en 2020-2021) *Network infrastructures* (anglais) - Benoît DONNET, Guy LEDUC, Laurent MATHY - [12h Labo., 30h Proj.] (années impaires)	Q1	30	-	[+]	**5**
MATH0462-1	*Discrete optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	Q2	30	20	[+]	**5**
MQGE0002-3	*Computational Optimization* (anglais) - Yves CRAMA	Q2	30	-	-	**5**

INFO0051-1	*Logic* (anglais) - Pascal GRIBOMONT - [10h Proj.]	Q1	25	25	[+]	**5**

Elective courses in bioinformatics

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

Elective courses in management

GEST3032-1	*eBusiness and eCommerce* (anglais) - Ashwin ITTOO	Q1	30	-	-	**5**

Optional company internships

Remarque : the course units ASTG9008-1 et ASTG9009-1 are mutually exclusive.

ASTG9008-1	*Internship (coupled with Master thesis)* (anglais) - Pierre GEURTS - [80j T. t.]	TA	-	-	[+]	**5**
ASTG9009-1	*Internship (independent of Master thesis)* - Pierre GEURTS - [40j T. t.]	TA	-	-	[+]	**10**

Miscellaneous

INGE0012-1	*Scientific research in engineering and its impact on innovation* (anglais) - Rodolphe SEPULCHRE	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.

Bloc d'aménagement du programme de l'année

Crédits supplémentaires Master en sciences des données (120 ECTS)

Optional courses

The following courses are prerequisites for some courses of this master programme. Therefore, students who are admitted to this master without having acquired equivalent courses must add them to the programme of their first year.

MATH2007-1	*Mathématiques générales I* - Françoise BASTIN	Q1	30	40	-	**6**
MATH0499-1	*Théorie des graphes* - Michel RIGO	Q1	25	20	-	**4**
MATH0495-1	*Eléments du calcul des probabilités* - Pascal GRIBOMONT - [5h Proj.]	Q1	15	15	[+]	**3**
MATH0487-2	*Eléments de statistiques* - Pierre SACRÉ - [25h Proj.]	Q1	15	10	[+]	**3**
MATH1222-3	*Introduction aux processus stochastiques* - Céline ESSER, Pierre GEURTS - [10h TD]	Q2	20	10	[+]	**5**
INFO0946-1	*Introduction à la programmation* - Benoît DONNET - [10h Labo.]	Q1	30	30	[+]	**5**
INFO2050-1	*Programmation avancée* - Pascal FONTAINE, Pierre GEURTS - [40h Proj.]	Q1	25	20	[+]	**5**
INFO0009-2	*Bases de données (organisation générale)* - Samuel HIARD - [25h Proj.]	Q2	26	26	[+]	**5**
MATH0500-1	*Introduction à l'algorithmique numérique* - Quentin LOUVEAUX - [6h Labo., 45h Proj.]	Q1	24	14	[+]	**5**
INFO0054-1	*Programmation fonctionnelle* - Pascal GRIBOMONT - [15h Proj.]	Q2	28	24	[+]	**5**
INFO0062-1	*Object-oriented programming* (anglais) - Bernard BOIGELOT - [20h Proj.]	Q2	25	20	[+]	**5**

MATH2019-1	*Mathématiques pour l'informatique 1* - Emilie CHARLIER, N...	Q1	26	26	-	**5**
MATH2020-1	*Mathématiques pour l'informatique 2* - Emilie CHARLIER, N...	Q1	26	26	-	**5**

Students must have a level B2 in English