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 from the core curriculum

PROJ0021-1	*Data science project* (anglais) - Christophe DEBRUYNE, Maxime FAYS, Pierre GEURTS, Gilles LOUPPE - [120h Proj.] **Corequis :** INFO0902-1 - Structures des données et algorithmes MATH0461-2 - Introduction to numerical optimization	Q2	5	-	[+]	**5**

Optional courses from the core curriculum

In agreement with the Jury, choose a total of 25 credits for Block 1 in the following list, among those that have not already been credited before.

Data Science foundation courses
The following courses (INFO0009-2, INFO8006-1, MATH0461-2 and INFO0902-1) 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 bachelelor of computer science, 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**
MATH0461-2	*Introduction to numerical optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	Q1	30	20	[+]	**5**
INFO0009-2	*Bases de données (organisation générale)* - Christophe DEBRUYNE - [25h Proj.]	Q2	26	26	[+]	**5**
INFO0902-1	*Structures des données et algorithmes* - Pierre GEURTS - [40h Proj.]	Q2	26	20	[+]	**5**
DATS0002-1	*Data visualization* (anglais) - Adrien DELIÈGE - [25h Proj.]	Q2	25	20	[+]	**5**
ELEN0016-2	*Computer vision* (anglais) - Anthony CIOPPA, Adrien DELIÈGE, Marc VAN DROOGENBROECK - [50h Proj.]	Q1	30	10	[+]	**5**
ELEN0060-2	*Information and coding theory* (anglais) - Louis WEHENKEL - [30h Proj.]	Q2	30	15	[+]	**5**
ELEN0449-1	*Computer Vision understanding* (anglais) - Anthony CIOPPA - [50h Proj.]	Q2	24	10	[+]	**5**
INFO0016-1	*Introduction to the theory of computation* (anglais) - Quentin LOUVEAUX	Q1	26	26	-	**5**
INFO0027-2	*Programming techniques* (anglais) - *Algorithmics* - Laurent MATHY - [40h Proj.] - *Software patterns* - Laurent MATHY - [30h Proj.]	Q2	 14 10	 14 10	 [+] [+]	**5**
INFO0939-1	*High performance scientific computing* (anglais) - Christophe GEUZAINE - [20h Proj.]	Q1	30	15	[+]	**5**
INFO0948-2	*Introduction to intelligent robotics* (anglais) - Pierre SACRÉ - [80h Proj.]	Q2	30	4	[+]	**5**
INFO2049-1	*Artificial Intelligence Methods for Natural Language Processing* (anglais) - Ashwin ITTOO	Q1	30	-	-	**5**
INFO8003-1	*Reinforcement learning* (anglais) - Damien ERNST - [45h Proj.]	Q2	25	10	[+]	**5**
INFO8004-1	*Advanced Machine learning* (anglais) - Pierre GEURTS, Gilles LOUPPE, Louis WEHENKEL - [20h Proj.]	Q2	25	-	[+]	**5**
INFO9015-1	*Logic for Computer Science* (anglais) - Pascal FONTAINE	Q1	24	20	-	**5**
INFO9023-1	*Machine Learning Systems Design* (anglais) - Thomas VRANCKEN - [17h Labo., 18h Proj.] **Corequis :** ELEN0062-1 - Introduction to machine learning	Q2	17	-	[+]	**5**
INFO9030-1	*Explainable Artificial Intelligence* (anglais) - Vân Anh HUYNHTHU - [50h	Q2	24	-	[+]	**5**

	Proj.] **Corequis :** ELEN0062-1 - Introduction to machine learning					
MATH0462-1	*Discrete optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	Q2	30	20	[+]	**5**
MATH1222-3	*Introduction aux processus stochastiques* - Céline ESSER, Pierre GEURTS - [10h TD]	Q2	20	10	[+]	**5**
MATH2022-1	*Monte Carlo methods in statistics* (anglais) - Arnout VAN MESSEM - [40h Proj.] (années paires)	Q2	24	12	[+]	**5**
MQGE9007-1	*Advanced Modeling Techniques in Optimization* (anglais) - Quentin LOUVEAUX, N...	Q1	30	-	-	**5**
SYST0022-1	*Linear Systems Design* (anglais) - Guillaume DRION, Pierre SACRÉ - [15h Proj.]	Q2	26	26	[+]	**5**
BIOL0021-1	*Biologie des systèmes* - Patrick MEYER - [10h TD] **Corequis :** OCEA0089-1 - Introduction to marine ecosystems modelling	Q1	10	-	[+]	**2**
OCEA0089-1	*Introduction to marine ecosystems modelling* (anglais) - Marilaure GRÉGOIRE **Corequis :** BIOL0021-1 - Biologie des systèmes	Q1	15	15	-	**3**
GEOG0057-1	*Analyse spatiale* - François JONARD, JeanPaul KASPRZYK	Q2	30	30	-	**5**
GEOG0059-1	*Infrastructures de données spatiales* - Roland BILLEN, JeanPaul KASPRZYK	Q1	30	30	-	**5**
GEST0832-4	*Marchés financiers* - Georges HÜBNER	Q2	40	15	-	**5**
FINA0063-1	*Advanced Statistical Methods in Finance* (anglais) - Julien HAMBUCKERS	Q1	30	-	-	**5**
GEST3032-1	*eCommerce Methods and Techniques* (anglais) - Ashwin ITTOO	Q1	30	-	-	**5**
SPAT0263-1	*Machine Learning in Space Sciences* (anglais) - Maxime FAYS	Q1	30	15	-	**5**
SPAT0264-1	*Machine Learning for Gravitational-wave Astronomy* (anglais) - Maxime FAYS	Q2	10	20	-	**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 or from the UNIC course catalog

Focus courses

DATS0001-1	*Foundations of data science* (anglais) - Gilles LOUPPE - [60h Proj.]	Q1	30	-	[+]	**5**
ELEN0062-1	*Introduction to machine learning* (anglais) - Pierre GEURTS, Louis WEHENKEL - [40h Proj.] **Corequis :** INFO8006-1 - Introduction to artificial intelligence	Q1	30	5	[+]	**5**
INFO9016-1	*Advanced Databases* (anglais) - Christophe DEBRUYNE - [20h Proj.] **Corequis :** INFO0009-2 - Bases de données (organisation générale)	Q1	24	20	[+]	**5**
MATH2021-1	*High-dimensional statistics* (anglais) - Gentiane HAESBROECK - [30h Proj.]	Q1	30	15	[+]	**5**
INFO8010-1	*Deep learning* (anglais) - Gilles LOUPPE - [60h Proj.]	Q2	30	-	[+]	**5**
INFO9014-1	*Knowledge representation and reasoning* (anglais) - Christophe DEBRUYNE - [45h Proj.]	Q2	24	20	[+]	**5**

Bloc 2

Compulsory courses from the core curriculum

DROI1357-1	*European law, (big) data and artificial intelligence applications seminar*	Q1	24	-	-	**5**

	(anglais) - Jérôme DE COOMAN, Ljupcho GROZDANOVSKI					
GEST3162-1	*Principles of management* (anglais) - Michaël PARMENTIER, Willem STANDAERT - [25h Proj.]	Q1	30	-	[+]	**5**
ATFE9009-1	*Master thesis* (anglais) - Christophe DEBRUYNE - [750h Proj.]	TA	-	-	[+]	**25**

[...] 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

Optional courses from the core curriculum

In agreement with the Jury, choose a total of 25 credits for Block 2 in the following list, among those that have not already been credited before.

Data Science foundation courses
The following courses (INFO0009-2, INFO8006-1, MATH0461-2 and INFO0902-1) 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 bachelelor of computer science, or unless the corresponding knowledge and skills have been acquired previously.

DATS0002-1	*Data visualization* (anglais) - Adrien DELIÈGE - [25h Proj.]	Q2	25	20	[+]	**5**
ELEN0016-2	*Computer vision* (anglais) - Anthony CIOPPA, Adrien DELIÈGE, Marc VAN DROOGENBROECK - [50h Proj.]	Q1	30	10	[+]	**5**
ELEN0060-2	*Information and coding theory* (anglais) - Louis WEHENKEL - [30h Proj.]	Q2	30	15	[+]	**5**
ELEN0449-1	*Computer Vision understanding* (anglais) - Anthony CIOPPA - [50h Proj.]	Q2	24	10	[+]	**5**
INFO0016-1	*Introduction to the theory of computation* (anglais) - Quentin LOUVEAUX	Q1	26	26	-	**5**
INFO0027-2	*Programming techniques* (anglais) - *Algorithmics* - Laurent MATHY - [40h Proj.] - *Software patterns* - Laurent MATHY - [30h Proj.]	Q2	 14 10	 14 10	 [+] [+]	**5**
INFO0939-1	*High performance scientific computing* (anglais) - Christophe GEUZAINE - [20h Proj.]	Q1	30	15	[+]	**5**
INFO0948-2	*Introduction to intelligent robotics* (anglais) - Pierre SACRÉ - [80h Proj.]	Q2	30	4	[+]	**5**
INFO2049-1	*Artificial Intelligence Methods for Natural Language Processing* (anglais) - Ashwin ITTOO	Q1	30	-	-	**5**
INFO8003-1	*Reinforcement learning* (anglais) - Damien ERNST - [45h Proj.]	Q2	25	10	[+]	**5**
INFO8004-1	*Advanced Machine learning* (anglais) - Pierre GEURTS, Gilles LOUPPE, Louis WEHENKEL - [20h Proj.]	Q2	25	-	[+]	**5**
INFO9015-1	*Logic for Computer Science* (anglais) - Pascal FONTAINE	Q1	24	20	-	**5**
INFO9023-1	*Machine Learning Systems Design* (anglais) - Thomas VRANCKEN - [17h Labo., 18h Proj.] **Corequis :** ELEN0062-1 - Introduction to machine learning	Q2	17	-	[+]	**5**
INFO9030-1	*Explainable Artificial Intelligence* (anglais) - Vân Anh HUYNHTHU - [50h Proj.] **Corequis :** ELEN0062-1 - Introduction to machine learning	Q2	24	-	[+]	**5**
MATH0462-1	*Discrete optimization* (anglais) - Quentin LOUVEAUX - [25h Proj.]	Q2	30	20	[+]	**5**
MATH1222-3	*Introduction aux processus stochastiques* - Céline ESSER, Pierre GEURTS - [10h TD]	Q2	20	10	[+]	**5**
MATH2022-1	*Monte Carlo methods in statistics* (anglais) - Arnout VAN MESSEM - [40h Proj.] (années paires)	Q2	24	12	[+]	**5**
MQGE9007-1	*Advanced Modeling Techniques in Optimization* (anglais) - Quentin LOUVEAUX, N...	Q1	30	-	-	**5**
SYST0022-1	*Linear Systems Design* (anglais) - Guillaume DRION, Pierre SACRÉ - [15h	Q2	26	26	[+]	**5**

	Proj.]					
BIOL0021-1	*Biologie des systèmes* - Patrick MEYER - [10h TD] **Corequis :** OCEA0089-1 - Introduction to marine ecosystems modelling	Q1	10	-	[+]	**2**
OCEA0089-1	*Introduction to marine ecosystems modelling* (anglais) - Marilaure GRÉGOIRE **Corequis :** BIOL0021-1 - Biologie des systèmes	Q1	15	15	-	**3**
GEOG0057-1	*Analyse spatiale* - François JONARD, JeanPaul KASPRZYK	Q2	30	30	-	**5**
GEOG0059-1	*Infrastructures de données spatiales* - Roland BILLEN, JeanPaul KASPRZYK	Q1	30	30	-	**5**
GEST0832-4	*Marchés financiers* - Georges HÜBNER	Q2	40	15	-	**5**
FINA0063-1	*Advanced Statistical Methods in Finance* (anglais) - Julien HAMBUCKERS	Q1	30	-	-	**5**
GEST3032-1	*eCommerce Methods and Techniques* (anglais) - Ashwin ITTOO	Q1	30	-	-	**5**
SPAT0263-1	*Machine Learning in Space Sciences* (anglais) - Maxime FAYS	Q1	30	15	-	**5**
SPAT0264-1	*Machine Learning for Gravitational-wave Astronomy* (anglais) - Maxime FAYS	Q2	10	20	-	**5**

Optional company internship

ASTG9009-1	*Internship (independent of Master thesis)* - Christophe DEBRUYNE - [40j T. t.]	TA	-	-	[+]	**10**

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

Bloc d'aménagement du programme de l'année

Crédits supplémentaires Master en science des données (120 ECTS)

Optional courses

Choisir des cours pour un total de 60 crédits parmi :

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

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* *- Partim 1 : Outils d'analyse pour les probabilités* - Laurent LOOSVELDT *- Partim 2 : Théorie des probabilités* - Laurent LOOSVELDT	Q1 	 6 20	 6 20	 - -	**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**
INFO0902-1	*Structures des données et algorithmes* - Pierre GEURTS - [40h Proj.]	Q2	26	20	[+]	**5**
INFO0009-2	*Bases de données (organisation générale)* - Christophe DEBRUYNE - [25h Proj.]	Q2	26	26	[+]	**5**
MATH0006-3	*Introduction to numerical analysis* (anglais) - Quentin LOUVEAUX	Q1	20	20	-	**4**
INFO0062-1	*Object-oriented programming* (anglais) - Bernard BOIGELOT - [20h	Q2	25	20	[+]	**5**

	Proj.]					
MATH2019-1	*Mathématiques pour l'informatique 1* - Emilie CHARLIER	Q1	26	26	-	**5**
MATH2020-1	*Mathématiques pour l'informatique 2* - Emilie CHARLIER	Q1	26	26	-	**5**
INFO8006-1	*Introduction to artificial intelligence* (anglais) - Gilles LOUPPE - [45h Proj.]	Q1	25	20	[+]	**5**

2. A level B2 in English