



DAT12M

2024 - 2025

DATI2M - Introduction

Introduction

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The digital transformation of society has led to explosive growth in the volume of data available. Most of the players in society now place great importance on using this data to help make objective decisions and develop their disciplinary focus. These specific needs have resulted in the emergence of **new data-oriented careers**.

The master's in data science: Information Technology a course in **scientific methods and technology tools** for answering social or scientific questions based on **the processing of frequently massive data sets** ("big data"). This discipline usually requires a structured model of the problem in question to be combined with statistics and mathematics to deliver a rigorous, quantitative, operational solution to the question posed. Computer infrastructure and complex calculation algorithms thus complement scientific methods in structuring and processing the data.

A computer infrastructure and complex calculation algorithms also complement these scientific methods to enable the structuring and processing of data.

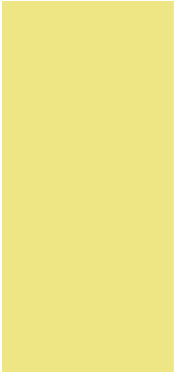
DATI2M - Teaching profile

Learning outcomes

Acquérir de solides bases méthodologiques en analyse, traitement et sécurité des données et les appliquer dans des domaines variés tel que sciences humaines, ingénierie, marketing, finance, assurance ou sciences du vivant...

Les étudiants acquerront des connaissances et développeront des compétences nécessaires pour :

- devenir des spécialistes en analyse de données – finalité Analyse de données (AD) (éventail d'algorithmes et de méthodes



LIST OF FOCUSES



- > Professional Focus : Data Analytics [en-prog-2024-dati2m-ldati210s]
- > Professional Focus : Cybersecurity [en-prog-2024-dati2m-ldati220s]

PROFESSIONAL FOCUS : DATA ANALYTICS [30.0]



				Year	
				1	2
● LELEC2770	Privacy Enhancing technology	Olivier Pereira François- Xavier Standaert	[q1] [30h+30h] [5 Credits]  > <i>French-friendly</i>		

o Content:

o Compulsory courses :

○ LINFO2145	Cloud Computing	Etienne Riviere	EN [q1] [30h+15h] [5 Credits]  > French-friendly	X	X
○ LINFO2241	Architecture and performance of computer systems	Tom Barbette	EN [q1] [30h+30h] [6 Credits]  > French-friendly	X	X

o Elective courses

⊗ LINFO2347	Computer system security	Ramin Sadre	EN [q2] [30h+15h] [5 Credits]  > French-friendly	X	X
⊗ LINFO2143	Concurrent systems : models and analysis	Charles Pecheur	EN [q1] [30h+15h] [5 Credits]  > French-friendly	X	X
⊗ LINFO2349	Networking and security seminar	Etienne Riviere Ramin Sadre			

MAJOR IN NUMERICAL METHODS AND OPTIMISATION

- Mandatory
- ⊗ Optional
- △ Not offered in 2024-2025
- ⊖ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
- △ ⊕ Not offered in 2024-2025 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫 Not open to incoming exchange students
- (FR) Teaching language (FR, EN, ES, NL, DE, ...)

Click on the course title to see detailed informations (objectives, methods, evaluation...)

The student who wishes to validate this option chooses 15 credits among:

Year

1 2

o Content:**o Compulsory courses**

○ LINMA2471	Optimization models and methods II	François Glineur Geovani Nunes Grapiglia	EN [q1] [30h+22.5h] [5 Credits] 🌐 > French-friendly	X	X
○ LINMA2380	Matrix computations	Raphaël Jungers	EN [q1] [30h+22.5h] [5 Credits] 🌐 > French-friendly	X	X

o One course between

⊗ LINFO2266	Advanced Algorithms for Optimization	Pierre Schaus	EN [q1] [30h+15h] [5 Credits] 🌐 > French-friendly	X	X
⊗ LINMA2450	Combinatorial optimization	Julien Hendrickx Geovani Nunes Grapiglia	EN [q1] [30h+22.5h] [5 Credits] 🌐 > French-friendly		X

⊗ Elective courses

⊗ LINMA2470	Stochastic modelling	Philippe Chevalier Mehdi Madani (compensates Philippe Chevalier)	EN [q2] [30h+22.5h] [5 Credits] 🌐 > French-friendly	X	X
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ELECTIVE TECHNICAL COURSES

- Mandatory
- ✘ Optional
- △ Not offered in 2024-2025
- ⊖ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
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Year

1 2

OPTIONS ET COURS AU CHOIX EN CONNAISSANCES SOCIO-ÉCONOMIQUES
[3.0]

BUSINESS RISKS AND OPPORTUNITIES

- Mandatory
- ✂ Optional
- △ Not offered in 2024-2025
- ⊗ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
- △ ⊕ Not offered in 2024-2025 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫 Not open to incoming exchange students
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

[Click on the course title to see detailed informations \(objectives, methods, evaluation...\)](#)

MAJOR IN INTERDISCIPLINARY PROGRAM IN ENTREPRENEURSHIP - INEO

Commune à la plupart des masters de l'EPL, cette option a pour objectif de familiariser l'étudiant-e avec les spécificités de l'entreprenariat et de la création d'entreprise afin de développer chez lui les aptitudes, connaissances et outils nécessaires à la création d'entreprise.

Cette option rassemble des étudiants de différentes facultés en équipes interdisciplinaires afin de créer un projet entrepreneurial. La formation interdisciplinaire en entrepreneuriat (INEO) est une option qui s'étend sur 2 ans et s'intègre dans plus de 30 Masters de 9 facultés/écoles de l'UCLouvain. Le choix de l'option INEO implique la réalisation d'un mémoire interfacultaire (en équipe) portant sur un projet de création d'entreprise. L'accès à cette option, ainsi qu'à chacun des cours, est limité aux étudiant-es sélectionnés sur dossier. Toutes les informations sur <https://uclouvain.be/fr/etudier/ineo>.

L'étudiant.e qui choisit de valider cette option doit sélectionner au minimum 20 crédits et au maximum 25 crédits. Cette option n'est pas accessible en anglais et ne peut être prise simultanément avec l'option « Enjeux de l'entreprise ».

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- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫 Not open to incoming exchange students
- (FR) Teaching language (FR, EN, ES, NL, DE, ...)

Click on the course title to see detailed informations (objectives, methods, evaluation...)

Year

1 2

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OTHERS ELECTIVE COURSES

Les cours au choix recommandés et accessibles aux étudiant-es du master ingénieur en sciences des données ou du master en sciences des données sont listés ci-dessus, dans les options et autres listes de cours au choix. L'étudiant-e est également libre de proposer d'autres cours des programmes de Masters EPL qui seraient pertinentes à son parcours personnel, pour autant que cela respecte les règles de constitution de programme du Master. Ces cours doivent être approuvés par le jury restreint.

OTHERS ELECTIVE COURSES

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- 🌐 Open to incoming exchange students
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Click on the course title to see detailed informations (objectives, methods, evaluation...)

Year

1 2

o Content:

The elective courses recommended and available for Master students in Data Science Engineering are listed here above and in the courses of EPL. However, a student can further suggest other courses that would be relevant for his/her personal curriculum, pending that this is compliant with the rules for setting up a personal Master programme.

⊗ Languages

Students may select from any language course offered at the ILV. Special attention is placed on the following seminars in professional

				1	2
		Caroline Klein (coord.) Mélanie Mottin (compensates Caroline Klein)	DE [q1+q2] [30h] [3 Credits] 🌐	X	X
⊗ LALLE2501	Professional development seminar-German	Caroline Klein (coord.) Mélanie Mottin (compensates Caroline Klein)	DE [q1+q2] [30h] [5 Credits] 🌐	X	X
⊗ LESPA2600	Vocational Induction Seminar - Spanish (B2.2/C1)	Paula Lorente Fernandez (coord.)	ES [q1] [30h] [3 Credits] 🌐	X	

Supplementary classes

To access this Master, students must have a good command of certain subjects. If this is not the case, in the first annual block of their Masters programme, students must take supplementary classes chosen by the faculty to satisfy course prerequisites.

To enter the Master in Data Science, Information Technology orientation, the student must have a minimum of previous skills in mathematics, computer science, algorithms and probability-statistics. If this is not the case, he/she must add additional courses to his/her Master's program. The content of this additional training is determined by the program commission. The skills to be mastered correspond to those of the following courses:

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⊗ Mathematics - Calculus and linear algebra

The student follows one of the following blocks:

⊗ Module 1

○ LINFO1111	Analysis	Pierre-Antoine Absil François Glineur	FR [q1] [45h+37.5h] [7 Credits] 🌐
○ LINFO1112	Algebra	Christophe Craeye Enrico Vitale	FR [q2] [30h+30h] [5 Credits] 🌐

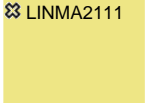
⊗ Module 2

○ LINGE1114	Mathematics I: analysis	Heiner Olbermann	FR [q1] [30h+30h] [5 Credits] 🌐
○ LINGE1121	Mathematics II: algebra and matrix calculus	Cécile Coyette (compensates Tom Claeys)	FR [q2] [30h+30h] [5 Credits] 🌐

○

○ Un cours parmi :

⌘ LINMA2111



Bachelor in Computer Sciences

[Access based on application](#)

See "Personalized access"

Non university Bachelors

> Find out more about [links](#) to the university

Diploma	Access	Remarks
BA en informatique de gestion - crédits supplémentaires entre 30 et 60	Les enseignements supplémentaires éventuels peuvent être consultés dans le module complémentaire .	Type court
BA en informatique et systèmes, orientation informatique industrielle - crédits supplémentaires entre 30 et 60		
BA en informatique et systèmes, orientation réseaux et télécommunications - crédits supplémentaires entre 30 et 60		
BA en informatique et systèmes, orientation sécurité des systèmes - crédits supplémentaires entre 30 et 60		
BA en informatique et systèmes, orientation technologie de l'informatique - crédits supplémentaires entre 30 et 60		
BA en informatique, orientation développement d'applications - crédits supplémentaires entre 30 et 60		
BA en informatique, orientation informatique industrielle - crédits supplémentaires entre 30 et 60		
BA en informatique, orientation réseaux et télécommunications - crédits supplémentaires entre 30 et 60		
BA en informatique, orientation sécurité des systèmes - crédits supplémentaires entre 30 et 60		
BA en informatique, orientation technologies de l'informatique - crédits supplémentaires entre 30 et 60		

Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks
"Licenciés"			
Masters			
Master [120] ingénieur civil en science des données, orientation technologies de l'information - deuxième finalité		Direct access	Au terme du master 120, chaque finalité du Master [120] ingénieur civil en science des données, orientation technologies de l'information peut être obtenue dans un nouveau programme de 30 crédits seulement.

Holders of a non-University 2nd cycle degree

Access based on validation of professional experience

> It is possible, under certain conditions, to use one's personal and professional experience to enter a university course without having the required qualifications. However, validation of prior experience does not automatically apply to all courses. Find out more about [Validation of priori experience](#).

Access based on application

Access based on application : access may be granted either directly or on the condition of completing additional courses of a maximum of 60 ECTS credits, or refused.

Admission on the basis of a submitted dossier may be granted either directly or on the condition of completing [additional coursework](#) of a maximum of 60 ECTS credits, or refused.

The first step of the admission procedure requires to submit an application online : <https://uclouvain.be/en/study/inscriptions/futurs-etudiants.html>

[Selection criteria are summarized here](#) (contact : epl-admission@uclouvain.be).

Pending the publication of the 2025-2026 study programme (expected in early March),

Contacts

Curriculum Management

Entity

Structure entity

Denomination

Faculty

Sector

Acronym

Postal address

SST/EPL/DACS

(DACS)

Louvain School of Engineering (EPL)

Sciences and Technology (SST)

DACS

Avenue Georges Lemaître 4-6 - bte L4.05.01

1348 Louvain-la-Neuve

www.uclouvain.be/epl

Website

Academic supervisor: [Laurent Jacques](#)

Jury

- Président: [Claude Oestges](#)

