Université Paris-Saclay
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M1 Data, Knowledge and Hybrid Artificial Intelligence (DKAI)

Master's degree
Specialisation Computer Science
Enrolment type
Formation initiale
Language(s) of instruction
English

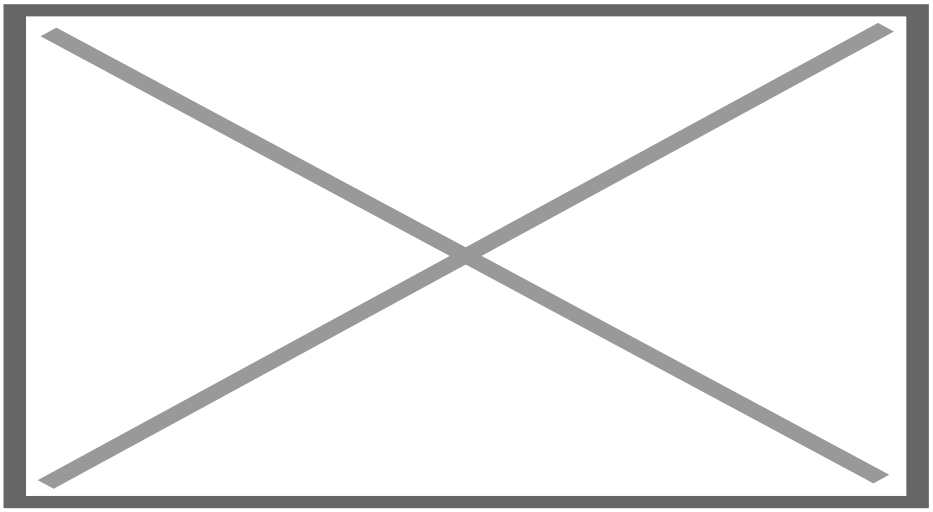
At the heart of the digital revolution, **data science and artificial intelligence (AI)** have become key drivers of innovation. They transform massive amounts of data into strategic information and actionable knowledge. The **Data, Knowledge and Hybrid Artificial Intelligence (DKAI)** track of the **Master in Computer Science** offers a high-level program that trains specialists capable of designing **trustworthy and hybrid AI systems** combining **machine learning** and **symbolic reasoning**.

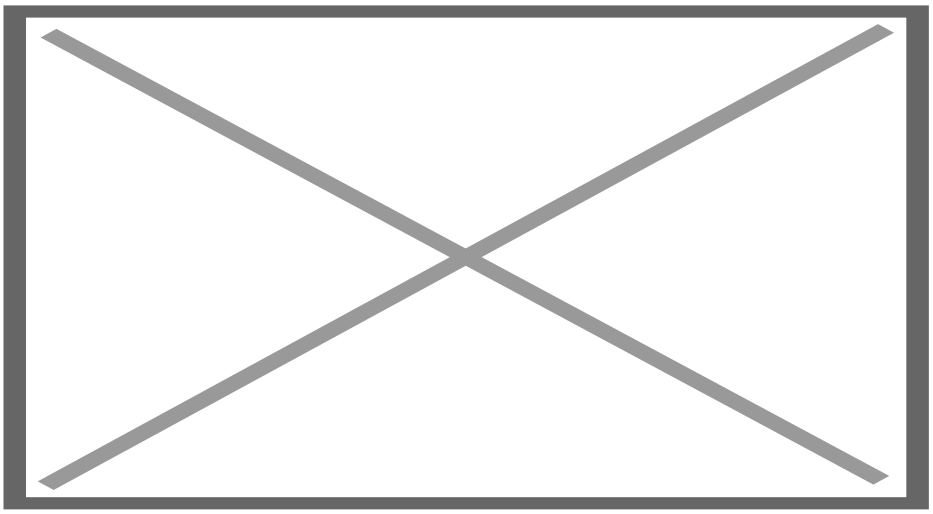
Organized over **two years (M1 and M2)**, the **DKAI track** of the **Master's in Computer Science at Université Paris-Saclay** is a comprehensive and stimulating program, recognized for its unique character. It stands out for the **cutting-edge skills** it provides and the **career opportunities** it offers, both in **industry** and in **research** in **data science** and **trustworthy artificial intelligence**.

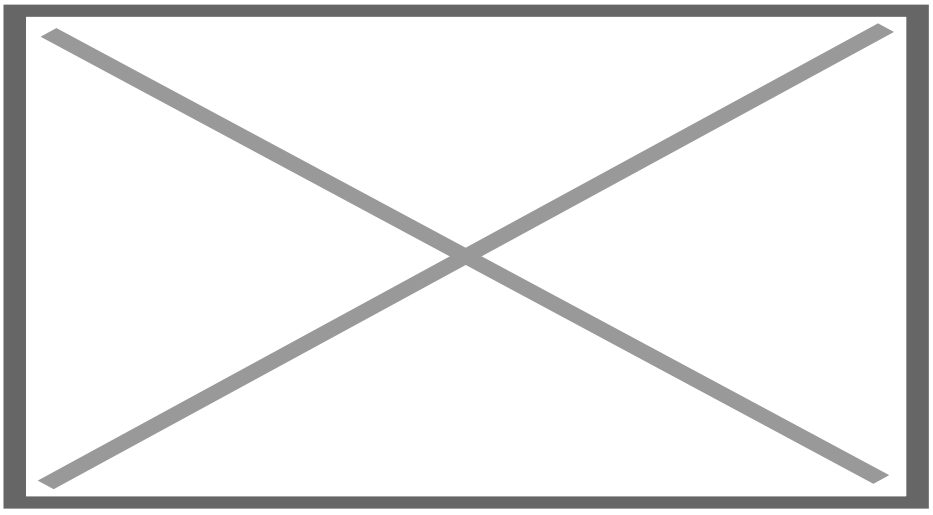
The **DKAI program** is built on an **integrated pedagogical approach**, combining the **acquisition of fundamental knowledge** in **data science**, **artificial intelligence**, and **knowledge engineering** with their **practical application** through **supervised projects**.

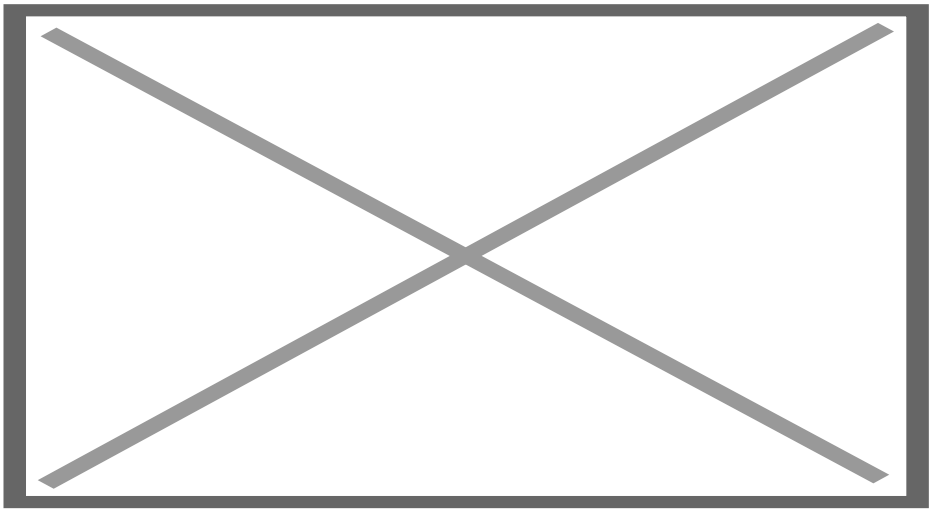
The courses are **closely linked to the research** conducted within the **Paris-Saclay research laboratories** and supported by **strong industrial institutions**. The **DKAI program** embraces an **international outlook**, providing **courses delivered in English** and fostering a **multicultural learning environment**.

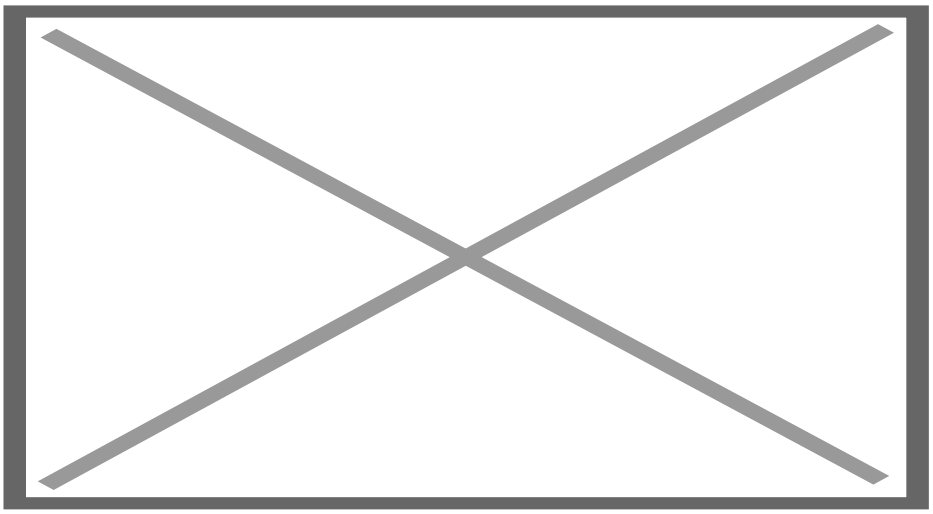
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Information

- Overview
- Application requirements
- Schedule

Présentation

Skills

Foundations and Global Understanding

Develop a solid understanding of the **theoretical and methodological foundations** of **data science**, **knowledge engineering**, and **hybrid artificial intelligence**, covering both the **symbolic** and **connectionist** dimensions of AI.

Skills in Data Science and Hybrid Artificial Intelligence

- Analyze and model **complex problems** by leveraging methods from **data science**, **symbolic AI**, and **hybrid AI**, across diverse contexts and in connection with user needs.
- Match each problem type with appropriate approaches — **machine learning**, **deep learning**, **symbolic reasoning**, **knowledge integration**, or **hybrid methods** — and assess their relevance in terms of **performance**, **explainability**, and **robustness**.
- Identify problems that require **distributed or massively parallel architectures**, and deploy suitable **big data tools**.
- Design, manage, and operate **relational databases**, **knowledge graphs**, or **unstructured data**, and develop appropriate **visualization and interaction interfaces** for data science applications.
- Develop and deploy **reliable, explainable, and trustworthy AI solutions** that integrate **knowledge representation**, **learning**, and **reasoning**.
- Evaluate and interpret the results of **complex AI/data systems** according to criteria of **performance, scalability, robustness**, and **relevance of the knowledge used**.
- Implement **validation and testing protocols** to ensure the **reliability** and **compliance** of AI and data science solutions.
- Ensure the **maintenance, evolution, and continuous adaptation** of AI/data systems in line with technological advances and application needs.
- Model and reason under constraints, and **extract knowledge** through **declarative mining** and **graph-based reasoning** approaches.

Transversal Skills

- Mobilize **advanced knowledge** in **machine learning**, **knowledge representation**, and **hybrid AI** to develop **innovative approaches**.
- Develop a **critical understanding** of AI and data science methods, particularly regarding their **interpretation limits** and **generalization capacity**.
- Contribute to **research and innovation projects** in AI and data science within **interdisciplinary and international contexts**.
- Assume **scientific and technical responsibilities** to improve the practices and performance of **AI/data teams**.
- Communicate effectively, both **orally and in writing**, in **French and English**, to **disseminate, promote, and explain** the results of AI and data science projects.
- Integrate **ethical, reliability, and social responsibility principles** into the **design and use** of artificial intelligence and knowledge management systems.

Objectives

The **Data, Knowledge and Hybrid Artificial Intelligence (DKAI) track** of the Master’s in Computer Science offers a two-year program of excellence (M1 and M2), combining data science and artificial intelligence. It brings together strong expertise in machine learning, big data, and an in-depth understanding of the different paradigms of AI—from symbolic AI to agent-based AI, including hybrid and generative AI. Throughout the curriculum, students develop their skills through numerous projects, challenges, and two internships in research laboratories or industry, preparing them for ambitious careers in both industry and research.

The **DKAI track** delivers advanced training over two years (M1 and M2) in data science and artificial intelligence. It combines advanced mastery of machine learning techniques, expertise in managing and analyzing massive datasets, and a deep understanding of the various paradigms of AI, from symbolic to

hybrid and generative approaches. Students benefit from multiple opportunities to put their academic knowledge into practice through projects, competitions, and internships in research labs or companies.

A springboard to the careers of tomorrow

This program prepares students to tackle major challenges related to transparency, ethics, and security in the development of AI-based systems. They acquire the skills required to design cutting-edge, reliable, and explainable solutions that comply with regulatory requirements and societal expectations in sensitive sectors. The DKAI track also offers strong academic prospects, equipping students with methodological rigor and scientific expertise to pursue a PhD and contribute to state-of-the-art research in data science and artificial intelligence.

An environment of excellence

Delivered in English, supported by advanced technological resources, and embedded in a stimulating learning environment, the DKAI track trains versatile and responsible experts, ready to address the challenges of data science and artificial intelligence on both a national and international scale.

Débouchés

Further Study Opportunities

Master’s in Mathematics
Engineering school
Students with a 2nd year Master's degree have the possibility to pursue doctoral research.
Multidisciplinary Engineering School
Generalist Engineering School through Apprenticeship

Admission

Capacity

Available Places

15

Target Audience and Entry Requirements

To be admitted to the Master 1 in DKAI, candidates must hold a Bachelor’s degree (or equivalent, Bac+3) in computer science, mathematics, engineering or a related field. Strong skills in mathematics (probability, statistics, algebra, logic), programming (Python, Java, C++), databases, and algorithms are essential.

To enroll in the M1 DKAI program, a B2 level (or higher) in English, according to the Common European Framework of Reference for Languages (CEFR), is required.

Période(s) de candidature

Inception Platform

From 15/01/2026 to 16/03/2026

MonMaster Platform

From February 17th to March 16th, 2026

To find out which platform you should apply through, please see the Masters' applications and enrolment page.

Supporting documents

Compulsory supporting documents

Motivation letter.

All transcripts of the years / semesters validated since the high school diploma at the date of application.

Curriculum Vitae.

Selection sheet completed.

https://cirrus.universite-paris-saclay.fr/s/jDS4JG5znqpeqRi

Additional supporting documents

Certificate of English level.

VAP file (obligatory for all persons requesting a valuation of the assets to enter the diploma).

Recommendation letters.

Supporting documents :
- Residence permit stating the country of residence of the first country
- Or receipt of request stating the country of first asylum
- Or document from the UNHCR granting refugee status
- Or receipt of refugee status request delivered in France

- Or residence permit stating the refugee status delivered in France
- Or document stating subsidiary protection in France or abroad
- Or document stating temporary protection in France or abroad.

Programme

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	d l
[DKAI] Foundations of Knowledge Graphs	3	Semestre 1	10.5		10.5				
Charger le détail									
[DKAI] Mathematics for Data Science	3	Semestre 1	10.5	10.5					
Charger le détail									
[DKAI] Large-Scale Data Management and Data Quality	3	Semestre 1	12	9					
Charger le détail									
[DKAI] Foundations of Agent-based systems	3	Semestre 1	9	8	4				
Charger le détail									
[DKAI] Distributed Query Processing and Optimization	3	Semestre 2	12		9				
Charger le détail									
[DKAI] Constraint Programming: Theory and Practice	3	Semestre 1	10.5	10.5					
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	d
[DKAI] Interactive Information Visualization	3	Semestre 2	10.5	10.5					
Charger le détail									
[DKAI] Algorithmic Foundations of Data Mining	3	Semestre 2	10.5	10.5					
Charger le détail									
Trustworthy AI: Fairness, Bias, and Responsibility	3	Semestre 2	10.5	10.5					
Charger le détail									
[DKAI] Data Camp - IPP	3	Semestre 1							
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis lea co
Group 1 – Required Elective Disciplinary Courses									
[AI] Machine Learning Basics 2	3	Semestre 2	15	6					
Charger le détail									
[AI] DEEP LEARNING	3	Semestre 2	10.5	10.5					
Charger le détail									
[AI] Machine Learning Basics 1	3	Semestre 1							
Charger le détail									
Group 2 – Elective Disciplinary Courses (to be chosen)									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis lea co
[AI] Hands on machine learning with scikitlearn	3	Semestre 1	9	12					
Charger le détail									
[M1 DiPaQ] Graphs and algorithms	3	Semester 1	10.5	10.5					
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practic class
1 UE Soft Skill à choisir								
Innovation et Entreprenariat	3	Semester 2	10.5	10.5				
Charger le détail								
Impacts Environnementaux du numérique	3	Semester 2	10.5	10.5				
Charger le détail								
CAD design for 3D printing	3	Semestre 2	10.5	10.5				
Charger le détail								
The art of fabricating tangible surfaces	3	Semestre 2	10.5	10.5				
Charger le détail								
History and Societal Impact of AI	3	Semestre 1	10.5	10.5				
Charger le détail								
UE libre ou langue								
History and Societal Impact of AI	3	Semestre 1	10.5	10.5				
Charger le détail								
Français langue étrangère	3	Semester 2	10.5	10.5				

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practic class
Charger le détail								
Anglais	3	Semester 2	10.5	10.5				
Charger le détail								
UE libre	3	Semestre 2						
Charger le détail								
TER et Stage court								
TER - Travail d'Etude et de Recherche	6	Semestre 2			21			
Charger le détail								
Stage court	6	Semester 2						
Charger le détail								

Teaching Location(s)

ORSAY
GIF SUR YVETTE

Contact

- **Fatiha SAIS**

  PR
- **Nadjib LAZAAR**

  PR

http://www.universite-paris-saclay.fr/formation/master/informatique/m1-data-knowledge-and-hybrid-artificial-intelligence-dkai