Université Paris-Saclay

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Add to Compare

M2 Bioinformatique, Biostatistiques et applications de l'intelligence artificielle

Master's degree
Specialisation Bioinformatics / Computational Biology
Enrolment type
Formation initiale
Formation continue
Language(s) of instruction
French

The **M2 BIBS-IA** program of the Master in Bioinformatics trains **research and development experts** at the intersection of biology, computer science, and mathematics. Students acquire in-demand skills in **artificial intelligence, data management and analysis, and modeling** across various areas of bioinformatics—genomics, structural biology, evolutionary biology, and digital health. These skills are applied in the life sciences, medicine, environmental sciences, and agronomy.

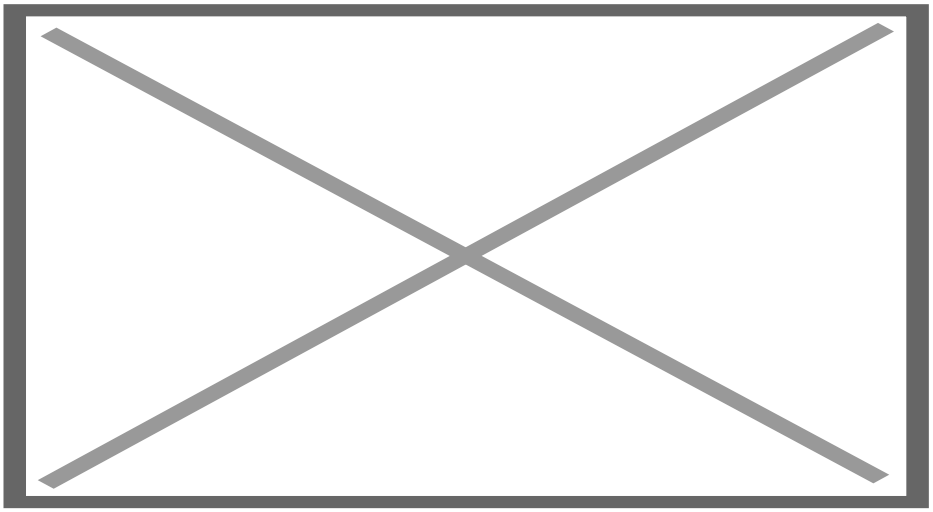
The **M2 BIBS-IA** program is built as a continuation of the **M1 BIBS-IA**. The *"Profile"* section specifies the expected prerequisites.

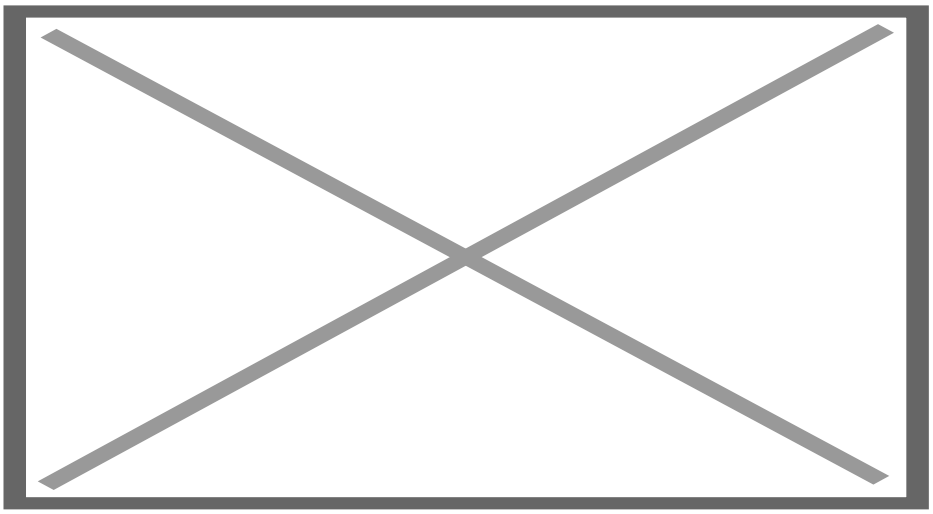
Within the BIBS-IA track, **artificial intelligence and data science** play a central role, approached both from a **theoretical perspective** (in mathematics and computer science) and from an **applied perspective**, closely linked to the specificities of biological and biomedical data.

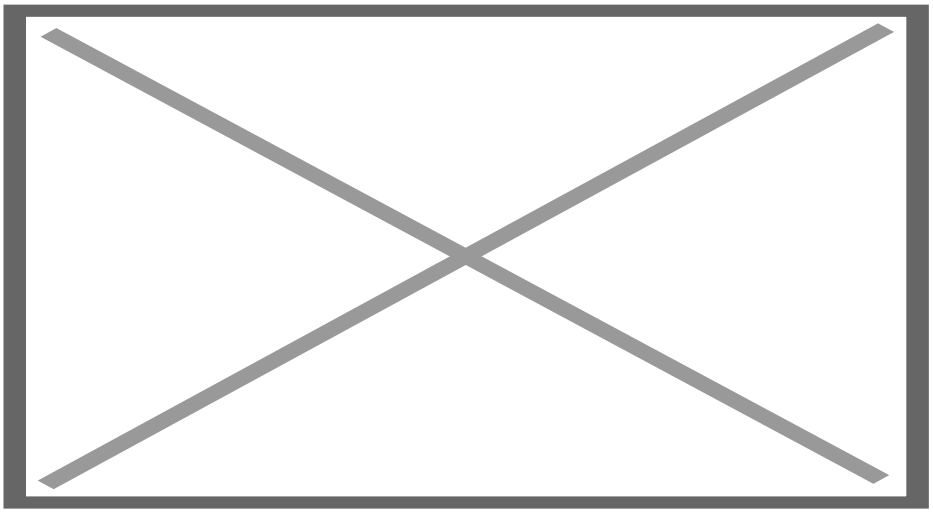
Multidisciplinary projects and hackathons are organized by experts from academia and industry. Students have access to a wide range of elective teaching modules, allowing them to specialize (applications of artificial intelligence in structural biology, genomics, clinical contexts, agronomy, etc.).

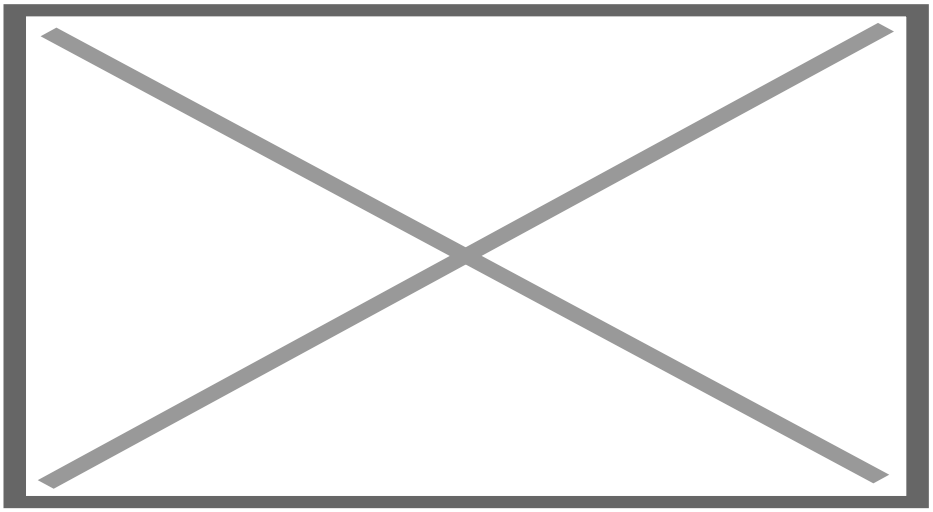
A **mandatory 4- to 6-month internship** ensures strong future career prospects for students, whether in research or in industry.

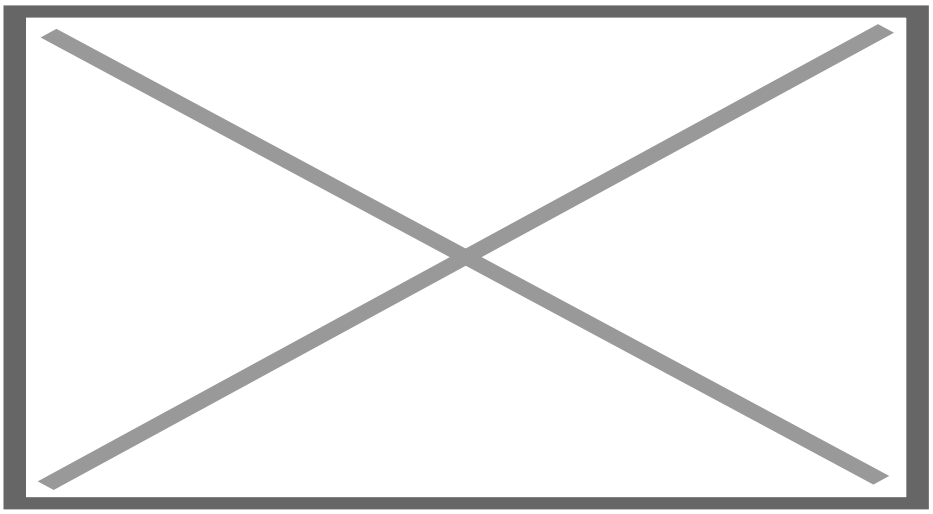
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Information

- Overview
- Application requirements
- Schedule

Présentation

Skills

The skills acquired upon completion of the **M2 BIBS-IA** are aligned with the national framework of the Master in Bioinformatics (RNCP 38964).

- **Understand** current challenges related to complexity and diversity in biology and the life sciences in general, and **contribute actively** to research and innovation in the academic, pharmaceutical, biotechnological, agri-industrial, and healthcare sectors;
- **Address** the challenges arising from the evolution and development of high-throughput data production technologies, coming from multiple and heterogeneous sources;
- **Master** computational approaches and artificial intelligence to analyze, model, and interpret large-scale biomedical data;

- **Lead** bioinformatics projects independently, in multidisciplinary environments, by developing innovative solutions using appropriate computational tools and programming languages;
- **Experiment with, develop, and test** new methods to explore hypotheses in the life sciences, at the interface between fundamental and applied research.

Objectives

The **M2 BIBS-IA** program is dedicated to the advanced research and development needs of companies and research organizations in **bioinformatics** and **biostatistics**.

This **multidisciplinary training program** meets these needs by preparing specialists at the interface of biology, computer science, and mathematics.

Upon completion of the M2 BIBS-IA, students **master several programming languages**, a wide range of **artificial intelligence**, algorithmic, **statistical, and data science** methods, enabling them to store, model, and analyze large-scale genomic and biomedical data. They also deepen their knowledge in key areas of bioinformatics (systems biology, structural biology, functional genomics) and apply the methods learned to diverse projects in life sciences and medicine, as well as in environmental sciences and agronomy.

The curriculum of the M2 BIBS-IA is organized into six major knowledge and skills blocks:

Block 1 – Management of large-scale data and optimization.
This block includes three teaching units focused on optimizing the processing of various types of data (relational databases and graph data). A project based on massive real-world datasets allows students to put their acquired knowledge into practice.

Block 2 – High-throughput genomics.
This block comprises two teaching units: one focused on comparative genomics and another on population genomics, with strong emphasis on the application of statistical methods in these domains.

Block 3 – Data analysis and AI for biology.
This block includes three teaching units, covering topics ranging from fundamental AI concepts such as machine learning models, to applications of AI in integrative biology and image analysis.

Block 4 – Scientific integrity and reproducibility.
This block comprises two pre-professional teaching units: a *reprohackathon project* and a unit supporting professional integration. Students acquire best practices in open science, scientific integrity, ethics, and energy efficiency (ecological impact of digital practices, particularly artificial intelligence).

Block 5 – Advanced applications of Artificial Intelligence.
Students select four teaching units within this block, which includes six dedicated to the M2 BIBS-IA track and focused on diverse applications of AI. Examples include a *data camp* (a machine learning hackathon on real-world datasets, jointly organized with École Polytechnique and Télécom Paris) and data mining in agronomy (jointly with AgroParisTech). In addition, students may choose elective units from other Master's programs (Computer Science, Biology-Health, etc.).

Débouchés

Career prospects

After a Master's + PhD: researcher or lecturer
Data Scientist
Data Manager
Bioinformatics Engineer (Research and Development)
Data scientist

Further Study Opportunities

PhD in Bioinformatics
Data Scientist, Data Analyst, Ingénieur·e en Machine Learning dans des secteurs innovants (tech, finance, santé, énergie, etc.) ;
R&D researcher or data modelling and analysis expert in leading-edge companies or laboratories.

Calendar

Start of programme (indicative date)
03/10/2025
End of programme (indicative date)
04/09/2026
Admission

Capacity

Available Places

24

Target Audience and Entry Requirements

Most courses in the **M2 BIBS-IA** program are taught in **French**, therefore proficiency in the French language is required.

The M2 BIBS-IA is designed as a continuation of the **M1 BIBS-IA** and brings together three student profiles:

- Students who have **successfully completed the M1 BIBS-IA**, all of whom are admitted into the M2 BIBS-IA;
- Students from **AgroParisTech** enrolled in the IODAA track (*From Information to Decision through Analysis and Learning*), all of whom complete a double degree year with the M2 BIBS-IA;
- (Subject to availability) Students who have completed an M1 equivalent to the M1 BIBS-IA, i.e., who have acquired equivalent knowledge and skills in biology, mathematics, and computer science (see the M1 BIBS-IA program for further details).

Students who already hold a Master's degree in **Bioinformatics** are **not eligible**. Students holding a Master's degree in a field other than bioinformatics (biology, computer science, or mathematics) may apply for entry into the M1. However, their applications will be considered **less of a priority** than those from students applying directly after a Bachelor's degree.

Période(s) de candidature

Inception Platform

From 04/05/2026 to 13/07/2026

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.

Additional supporting documents

Certificate of French (compulsory for non-French speakers).

Certificate of English level (compulsory for non-English speakers) or GMAT / GRE test results.

Detailed description and hourly volume of courses taken since the beginning of the university program.

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

Document indicating the list of local M2 choices available here : https://urlz.fr/i3Lo.

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	dist lea co
Projet données massives	2	Semestre 1	2		18				
Charger le détail									
Bases de Données Avancées	2	Semestre 1	10	10					
Charger le détail									
Graphes biologiques et optimisation	2	Semestre 1	12	6					
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dista lear cou
Génomique des populations	2	Semestre 1	10		10				
Charger le détail									
Génomique comparée	2	Semestre 1	10		10				
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dista learn cou
Analyse d'Images en Biologie	2	Semestre 1	8		12				
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dista learn cou
Analyse de données omiques et biologie intégrative	2.5	Semestre 1	15	5	20				
Charger le détail									
Modèles pour le Machine Learning	2.5	Semestre 1	15		15				
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
Reprohackathon	3	Semestre 1	11		19			
Charger le détail								
Mise en situation professionnelle	2	Semestre 1	10	15				
Charger le détail								

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	di le
Méthodologie en Recherche Clinique et Statistiques	2	Semestre 1	10	10					
Charger le détail									
LLM pour les séquences protéiques	2	Semestre 1	10		10				
Charger le détail									
UE libre Catalogue S1	2.5	Semestre 1							
Charger le détail									
Advanced Machine Learning	2	Semestre 1	10	10					

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	di le c
Charger le détail									
Data Camp	2	Semestre 1	20		10				
Charger le détail									
Fouille de données pour le vivant	2	Semestre 1	10		10				
Charger le détail									
Analyse d'images et intelligence artificielle	2	Semestre 1	10	10					
Charger le détail									

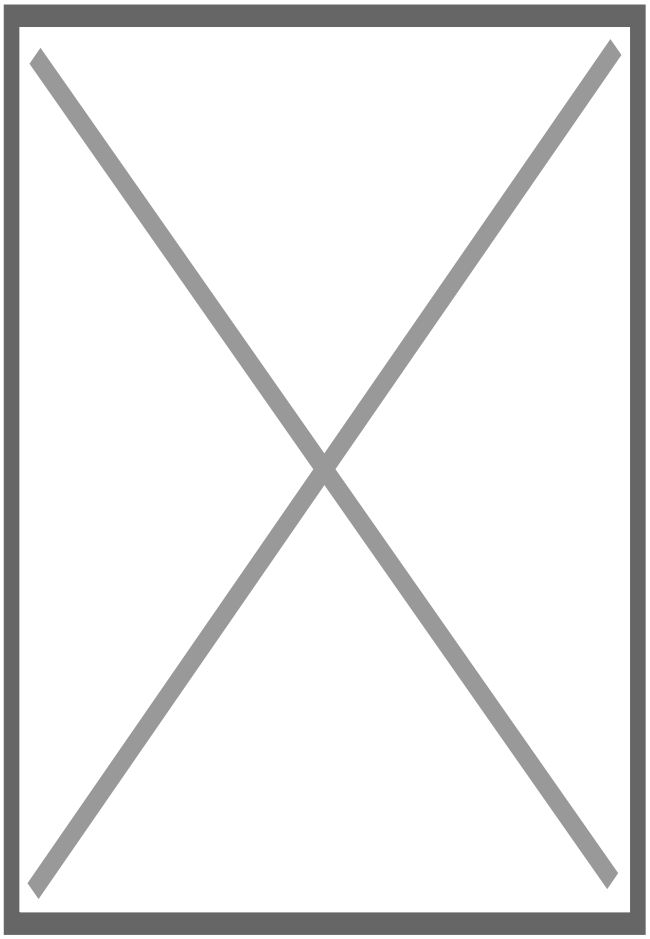
Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	distan learni cours
Stage	30	Semestre 2							
Charger le détail									

Teaching Location(s)

ORSAY

Training campus

Javascript est requis pour visualiser cette carte.



Saclay Moulon

Saclay / Gif-sur-Yvette / Orsay
Bus 4606 / 4609 / 4611 / 5154
RER B Le guichet
Voir
Student restaurant (CROUS)
Library
Sports facilities
Student residence

Contact

- **Fanny Pouyet**

  MCF

http://www.universite-paris-saclay.fr/formation/master/bio-informatique/m2-bioinformatique-biostatistiques-et-applications-de-lintelligence-artificielle-bibs-ia