Université Paris-Saclay
Life Sciences and Health
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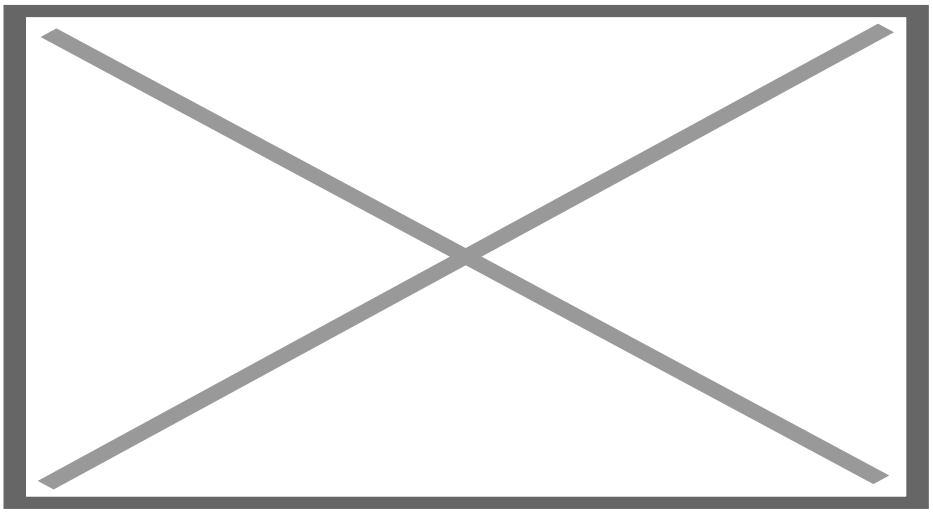
Bioinformatics / Computational Biology

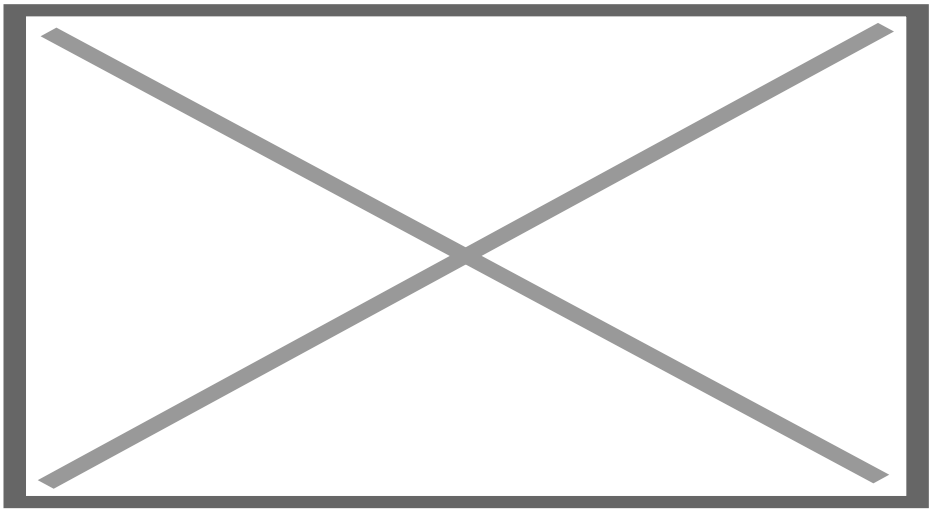
Master's degree
Language(s) of instruction
English

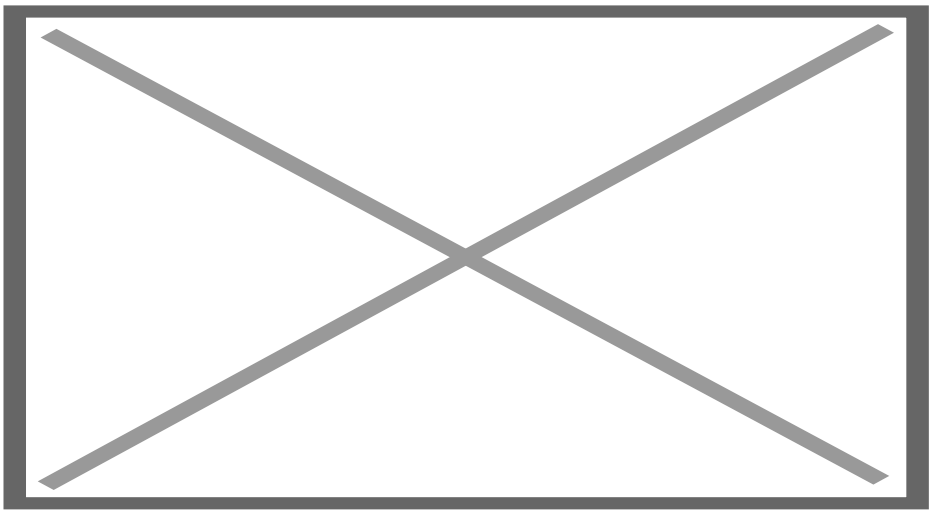
The **Master in Bioinformatics** trains research and development experts at the intersection of biology, computer science, and mathematics. Students acquire sought-after skills in **data analysis, modeling, and artificial intelligence** across various areas of bioinformatics—*genomics, structural biology, evolutionary biology, digital health,* etc.—and apply their knowledge to projects in the life sciences, medicine, environmental sciences, and agronomy.

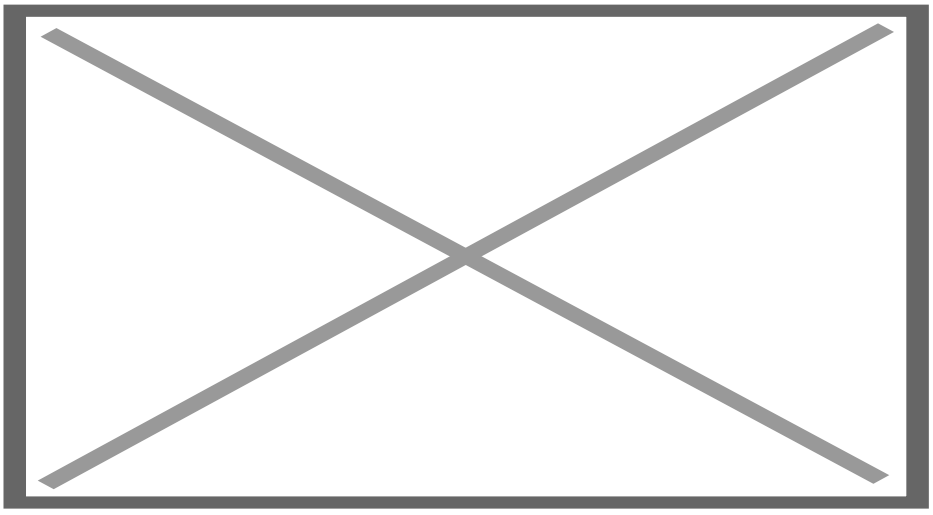
The **Master in Bioinformatics** tracks are organized by semester, and each semester is structured into **knowledge and skills blocks**. Each block includes both **core modules** and **applied modules** built around the concepts to be acquired. A **mandatory internship** is required each year: in **M1** (2 to 4 months) and in **M2** (4 to 6 months).

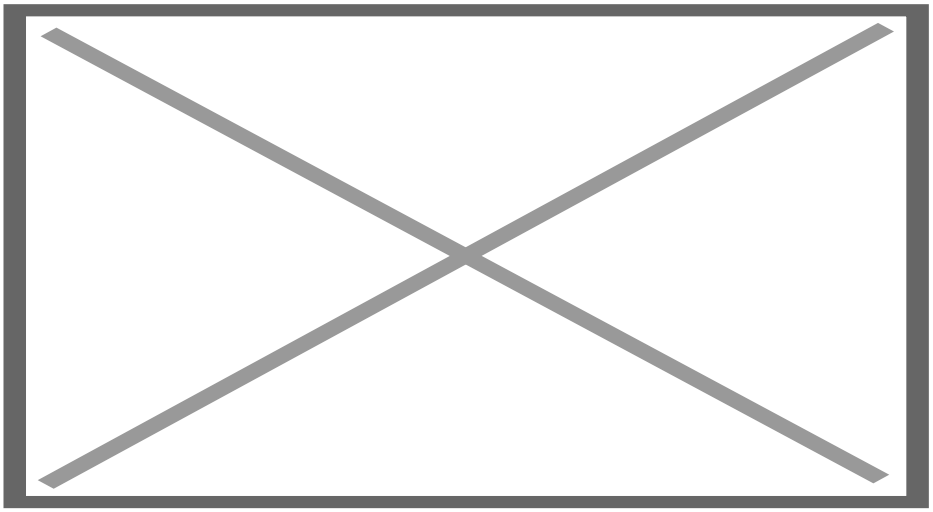
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Information

- List of Pathways
- Overview
- Application requirements

Liste parcours

Master’s Year 1

M1 Bioinformatique, Biostatistiques et applications de l'intelligence artificielle

Add to Compare

M1 Genomics Informatics Mathematics and Artificial Intelligence for Health and Environment (GENIOMHE)

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Master’s Year 2

M2 Bioinformatique, Biostatistiques et applications de l'intelligence artificielle

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M2 Genomics Informatics Mathematics and Artificial Intelligence for Health and Environment (GENIOMHE)

Add to Compare

Présentation

Skills

The targeted knowledge and skills correspond to those defined in the **RNCP38964** reference framework.

We provide a synthetic overview below:

- **Select, evaluate, and optimize** computational and statistical methods from data science and artificial intelligence to analyze large-scale and heterogeneous biological data.
- **Analyze** a biological or biomedical problem and design an appropriate model or solution, either by using existing computational and statistical methods or by developing new ones.
- **Integrate** into a project and work collaboratively by applying project management methodologies.
- **Explain and present**, both orally and in writing, a project, scientific results, or the outcome of a literature review, in French and English.
- **Adhere** to principles of ethics, professional conduct, social and environmental responsibility, and data security.

  All of these skills are first formally introduced and then **applied in practice through various projects** using diverse and real-world datasets.

Fiche nationale du Répertoire National des Certifications Professionnelles (RNCP)

Learning outcome targets

The **Master in Bioinformatics** is focused on the advanced research and development needs of companies and research organizations in **bioinformatics, biostatistics, and biotechnologies**, as well as in the life sciences and agronomy. This multidisciplinary program addresses these needs by training specialists at the interface of **biology, computer science, and mathematics**.

Upon completion of the Master's program, students master several programming languages, along with a range of methods in **algorithms, artificial intelligence, statistics, and databases**, enabling them to store and analyze massive genomic and biomedical datasets (Big Data). They also deepen their expertise in key areas of bioinformatics (systems biology, structural biology, functional genomics, etc.) and apply the methods learned to diverse projects in the life sciences and medicine, as well as in environmental sciences and agronomy.

Graduates are able to:

- **Understand** current challenges related to complexity and diversity in biology and the life sciences in general, and excel in research and innovation across the academic, pharmaceutical, biotechnological, agri-industrial, and healthcare sectors;
- **Address** new challenges arising from the rapid evolution and development of high-throughput data production technologies, stemming from multiple and heterogeneous sources;
- **Master** information technologies associated with the analysis and modeling of biomedical data;
- **Independently lead** application development projects in multidisciplinary contexts, using various programming languages, proposing innovative computational solutions, and carrying out the necessary analyses and developments to test new methods and hypotheses in the life sciences.

Débouchés

Career prospects

After a Master's + PhD: researcher or lecturer
Data Scientist
Data Manager
Platform manager

Bioinformatics Engineer (Research and Development)
After a Master's degree: Data scientist
After a Master’s degree: Artificial intelligence (AI) specialist
Research or Design Engineer
Lecturer (after a PhD)
Data Scientist
Consultant

Further Study Opportunities

PhD in Bioinformatics
Specialised Master's
fields of statistical learning, artificial intelligence and advanced data analysis
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.
Head of project/mission
Admission

Target audience

In terms of prerequisites, the **Master in Bioinformatics** welcomes students from undergraduate degrees in biology, mathematics, computer science, or equivalent, with a strong motivation for multidisciplinarity.

The **M1 BIBS-IA** track offers extensive, tailored remedial courses depending on the students’ backgrounds, thus opening the Master to students coming from both single-discipline (biology, mathematics, computer science) and multidisciplinary Bachelor’s degrees. Courses are taught in **French**.

The **M1 GENIOMHE-AI** track primarily recruits students with a **multidisciplinary profile**, expected to have skills in both biology and digital sciences (computer science or applied mathematics). Courses are taught in **English**.

Contact

- **Sarah Cohen Boulakia**

http://www.universite-paris-saclay.fr/formation/master/bio-informatique