Université Paris-Saclay

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

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

The GENIOMHE-AI Master's degree trains specialists in research and development in the field of Bioinformatics for **genomics** and **precision medicine**. This program allows students to master **algorithmics**, various **programming** languages and techniques, as well as advanced techniques in **data science**, **artificial intelligence**, **statistics**, and databases for analyzing massive data.

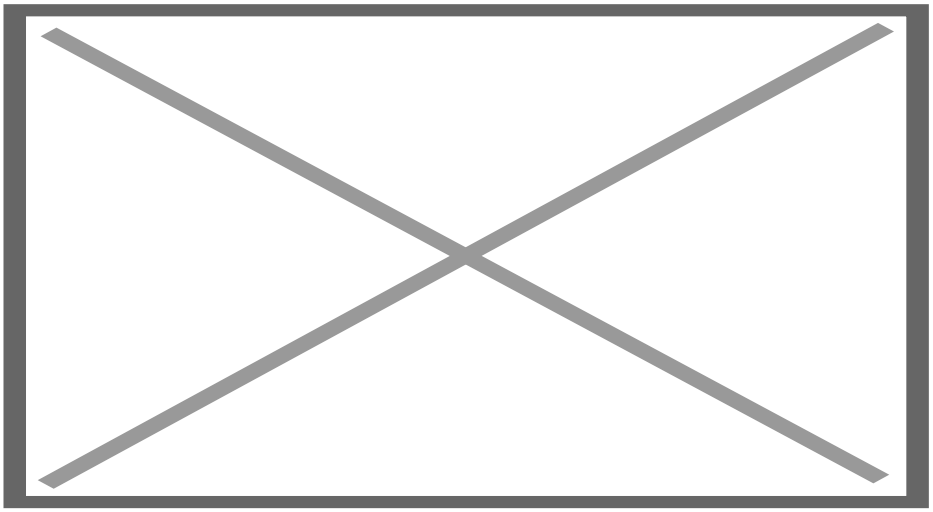
The M1 GENIOMHE-AI program runs from September to March. A mandatory two-month internship will take place from April onwards in an academic research laboratory or a company.

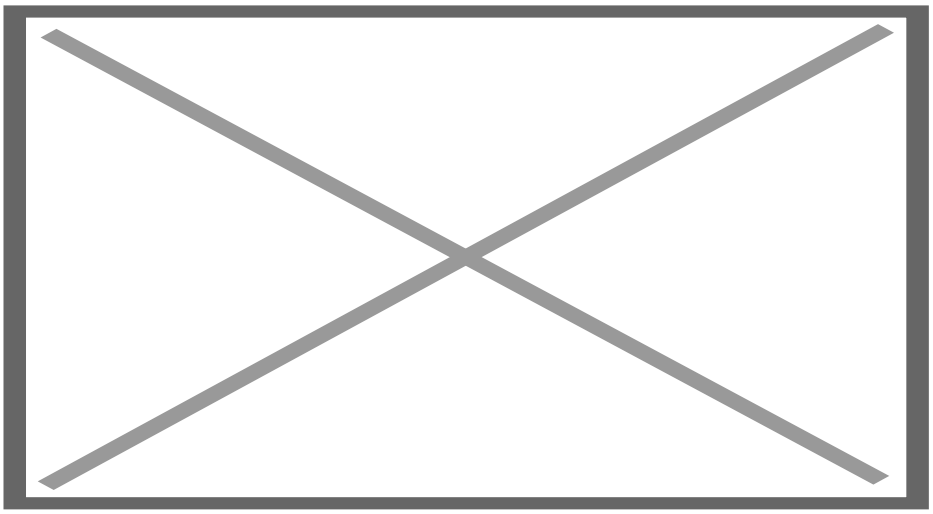
By the end of the M1, students will have acquired skills in genomics and human genetics, genomic data analysis, bioinformatics tools and phylogenetics, databases, machine learning and data mining, deep learning, imperative and object-oriented programming, biological systems modeling, and multivariate statistics.

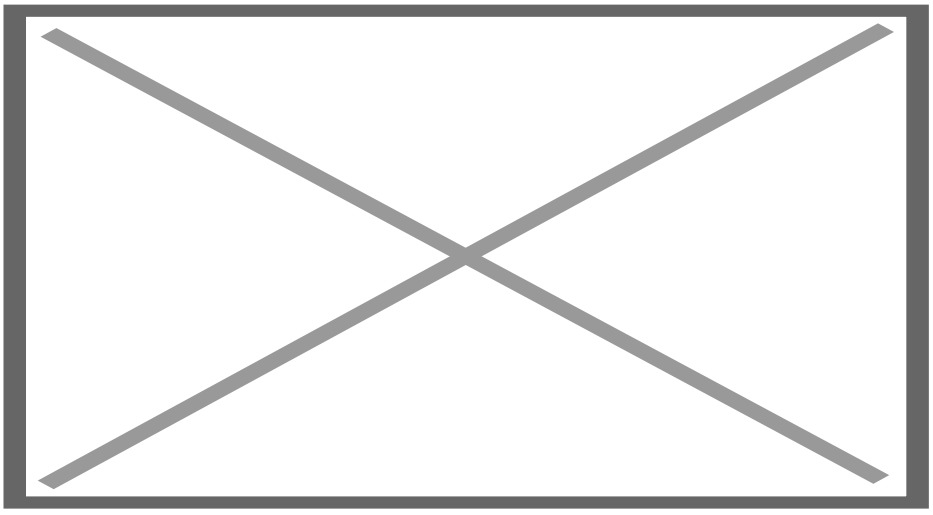
Students will also be introduced to FAIR principles and will have projects to complete.

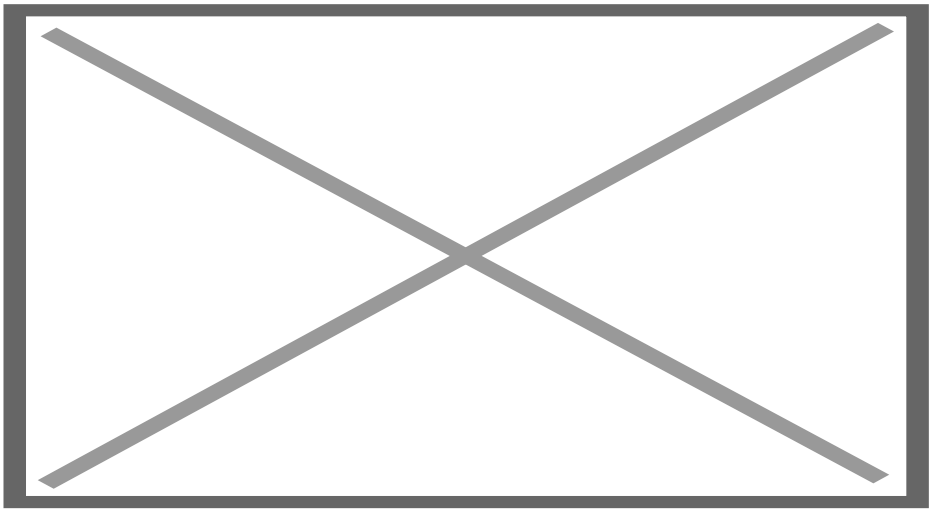
Two opening modules will also be mandatory : a module on sustainable development and a module to be chosen from a list.

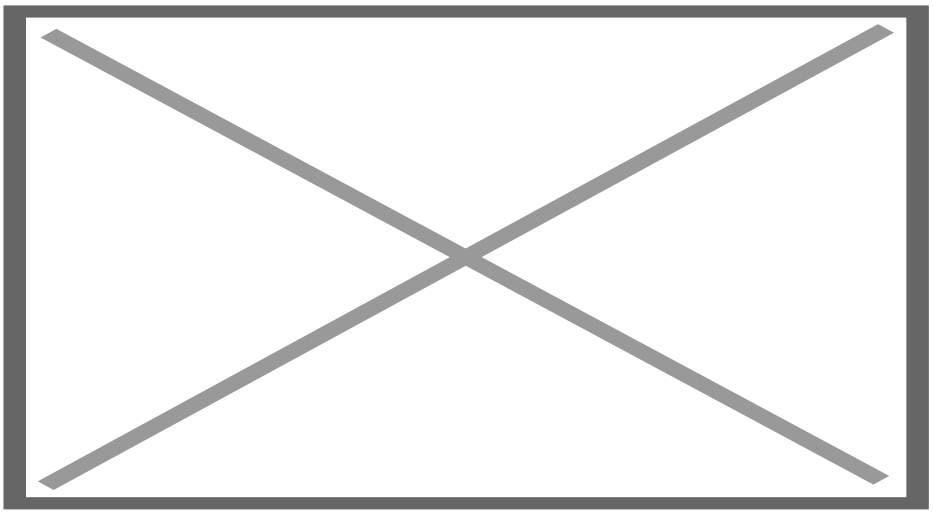
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Information

- Overview
- Application requirements
- Schedule

Présentation

Skills

Master the fundamental concepts of genomics, algorithms and programming, artificial intelligence, and statistics.

Objectives

This master's degree is a multidisciplinary training program that allows students to: understand the complex and diverse challenges of biology in order to meet current research and innovation needs in academic research, the biotechnology industry, the pharmaceutical industry and health; meet the new challenges related to precision medicine made possible by the rapid and massive production of genomic data; meet the challenges of using artificial intelligence in the health fields; master biomedical data analysis and modeling techniques; be autonomous in managing application development projects in various programming languages, and propose innovative IT solutions.

Débouchés

Further Study Opportunities

Master of Bioinformatics
Data Scientist, Data Analyst, Ingénieur·e en Machine Learning dans des secteurs innovants (tech, finance, santé, énergie, etc.) ;
2nd year Master’s

Calendar

Start of programme (indicative date)
01/09/2026
End of programme (indicative date)
31/08/2027
Admission

Admission Route

Computer Science
Life Sciences
Life and Earth Sciences

Capacity

Available Places

25

Target Audience and Entry Requirements

- Students who have acquired knowledge and skills in both Biology and Informatics during their course (for example: Joint honours in Life Sciences-Informatics, Paris-Saclay undergraduate degree in selective Life Sciences-Info, Life Sciences undergraduate degree in Bioinformatics, undergraduate computing degree in Bioinformatics, Engineering school, etc.) . * Students who have completed a course in Biology but have an interest in Informatics and have acquired complementary knowledge and skills in this field.

Période(s) de candidature

Inception Platform

From 15/01/2026 to 25/04/2026

Supporting documents

Compulsory supporting documents

Motivation letter.

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

Certificate of English level.

Curriculum Vitae.

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

Additional supporting documents

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

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	di le c
Bioinformatic tools	3	Semestre 1	9	13.5					
Charger le détail									
Structural Genomics	3	Semestre 1	9	13.5					
Charger le détail									
Genome sequencing	3	Semestre 1	9	13.5					
Charger le détail									
Genetics of complex pathologies	3	Semestre 1	9	13.5					
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	di le c
Prokaryotic genomics	3	Semestre 2	9	13.5					
Charger le détail									
Methods for Phylogeny	3	Semestre 2	9	13.5					
Charger le détail									
NGS data processing methodology	2	Annualisé			17				
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	di le c
Refresher course in Shell, Python, algorithmics	1	Annualisé		40					
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	di le
Object Oriented Programming for Machine Learning	3	Semestre 1	9	13.5					
Charger le détail									
Multivariate statistics for genomics.	3	Semestre 1	9	13.5					
Charger le détail									
Machine learning and data mining	3	Annualisé	9	13.5					
Charger le détail									
Sequence algorithmics	3	Annualisé	9	13.5					
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis lea co
Modeling of biological systems	3	Semestre 2	9	13.5					
Charger le détail									
Advanced databases	3	Annualisé	9	13.5					
Charger le détail									
Frameworks for Deep Learning	2	Semestre 2		17					
Charger le détail									
Deep learning	2	Annualisé	9	9					
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis lea co

FAIR project management	1	Semestre 1	3	6					
Charger le détail									
Project	2	Semestre 2			9				
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis lea co
UE libre Catalogue S1	2.5	Semestre 1							
Charger le détail									
Sustainable development and ethics	2	Semestre 1							
Charger le détail									

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	distan learn cour
Internship	10	Semestre 2							
Charger le détail									

Teaching Location(s)

EVRY

Contact

- **Valérie CHAUDRU**

  MCF

http://www.universite-paris-saclay.fr/formation/master/bio-informatique/m1-genomics-informatics-mathematics-and-artificial-intelligence-health-and-environment-geniomhe-ai