

Milken Institute School of Public Health

THE GEORGE WASHINGTON UNIVERSITY

Department of Biostatistics and Bioinformatics MS in Health Data Science 2026-2027

Note: All curriculum revisions will be updated immediately on the website <http://www.publichealth.gwu.edu>

Program Director

Marcos Pérez Losada, PhD
Department of Biostatistics and Bioinformatics
800 22nd Street, NW, 7th floor
Washington, DC 20052
Tel: 202-765-8760
Email: mlosada@gwu.edu

Mission

The mission of the MS in Health Data Science is to train the next generation of leaders and practitioners in public health and medicine. Students in the program develop practical skills for innovative data analysis and will be trained in becoming excellent communicators of scientific findings in public health and biomedical research. The program takes advantage of the rich bioinformatics and biostatistical resources at GW and in the nation's capital and is designed to prepare students to be independent practitioners and collaborators in interdisciplinary research.

MS Competencies

Upon completion of the MS program in Health Data Science students will possess the following competencies.

1. **Programming:** Develop skills in programming, data structures, algorithms, machine learning, high-performance computing and apply these skills to create approaches that facilitate biological data analysis.
2. **Biology:** Develop a basis of knowledge in biology and evaluate biological data generation technologies.
3. **Statistics:** Apply statistical research methods in the context of molecular biology, genomics, medical, and population genetics research.
4. **Foundational Knowledge:** Interpret and synthesize the various foundational concepts of bioinformatics, including genomics, algorithms, and other key tools used in bioinformatics.
5. **Conceptual Integration:** Integrate concepts and data across fields of computer science, statistics, data science, biology, and health sciences through bioinformatics.

Minimum Program Requirements

The program requires a total of 36 credit hours of course work including a minimum of 2 credits of research and Master's Thesis work. Students in the program must hold an undergraduate degree from an accredited institution of higher learning and should have a strong background in mathematics, statistics, biology, bioengineering, and/or computer science.

Prerequisites

- a course in undergraduate statistics
- a course in undergraduate biology
- a course in undergraduate computer science

All applications are submitted through [SOPHAS.org](https://sophas.org). Information about Milken Institute SPH Admissions and policies are available online at <http://publichealth.gwu.edu/admissions/graduate-admissions>. For reporting GRE general test scores use the following institutional code: 5268.

Program Requirements

The curriculum includes broad training across core areas of bioinformatics, including statistics, biology, computer science, and ethical issues in the conduct of biomedical research. The program requires a total of 36 credit hours of coursework including a minimum of 2 credits of research and Master's Thesis work.

Course Distribution Summary	Credits
Required Courses	18
Elective Courses	16
Master's Thesis and additional research courses (minimum required)	2
Total credits	36

Graduation Requirements

All students accepted to this MS program must follow the policies and regulations outlined in the [GW Bulletin](#) and the [GWSPH Student Handbook](#). This includes, but is not limited to:

- Minimum Grade Point Average (GPA)
- Minimum Course Grades
- Continuous Enrollment
- Maximum Time to Degree
- Required Minimum Degree Credits
- Transfer Credit Policy
- CITI Training
- Integrity Quiz and Plagiarism
- Professional Enhancement (PE) Hours
- Applied Practice Experience (e.g., Practicum)
- Culminating Experience (e.g., thesis)

Required Courses (18 credits)

PUBH 6850	Introduction to SAS for Public Health Research	Fall, Spring	1
PUBH 6851	Introduction to R for Public Health Research	Fall, Spring	1
PUBH 6852	Introduction to Python for Public Health Research	Fall, Spring	1
PUBH 6860	Principles of Bioinformatics	Fall	3
PUBH 6884	Bioinformatics Algorithms and Data Structures	Spring	3
PUBH 6854	Applied Computing	Fall	3
PUBH 6868	Quantitative Methods	Spring	3
PUBH 6886	Statistical and Machine Learning for Public Health Research	Fall	3
PUBH 6080	Pathways to Public Health ¹	Any time	0

Elective Courses (16 credits)

PUBH 6859	High Performance and Cloud Computing	Spring	3
PUBH 6861	Public Health Genomics	Spring	3
PUBH 8885	Computational Biology	Fall	3
PUBH 6894	Research Analytics	Online	3
PUBH 6867	Health Data Visualization	Spring	3
PUBH 8878	Statistical Genetics	Fall	3
PUBH 6870	Advanced Survival Analysis Markov Multistate Models	Spring	1
PUBH 6871	Advanced Survival Analysis Recurrent Events	Spring	1
PUBH 6872	Advanced Survival Analysis Competing Risks	Spring	1
PUBH 6888	Neural Networks with Applications in Biomedical Research	Fall	3

Topic Courses ²

	Microbiome Data Analysis in R		3
	Databases and Structured Query Language		1
	Generative Artificial Intelligence for Health Data Analysis		3

Required Research/Thesis Courses ³

PUBH 6897	Research in Biostatistics and Bioinformatics	Fall, Spring, Summer	1-4
PUBH 6898	Master of Science Thesis	Fall, Spring, Summer	1-3

¹ PUBH 6080 will be waived for students who have a prior degree from a CEPH-accredited school or program of public health

² Topics courses (PUBH 6899) vary year to year. Listed are some recent examples. Students may take multiple topics courses.

³ A minimum of one credit each of PUBH 6897 and PUBH 6898 is required. If more credits are taken, they will count towards the elective credits.

Advising Notes

While degrees are awarded at the end of each semester, formal commencement ceremonies occur only in May. Students are eligible to participate in graduation activities only after they have completed all degree requirements and have no financial obligations to the University. Students may include MS designation after their name upon completion of all degree requirements.

Students in this program must have a successful defense of a Master's Thesis or presentation of a Research Report. The defense of a Master's Thesis is different from the PUBH 6898 Master of Science Thesis course, which is a requirement.

Students should participate in department-led ethical and professional skills training.

Sample Schedule MS-HDS

Year	Term	Course	Title	Credits
Year 1	Fall	PUBH 6850	Introduction to SAS for Public Health Research	1
		PUBH 6851	Introduction to R for Public Health Research	1
		PUBH 6852	Introduction to Python for Public Health Research	1
		PUBH 6860	Principles of Bioinformatics	3
		PUBH 6854	Applied Computing	3
		PUBH 6080	Pathways to Public Health ⁴	0
	Spring	PUBH 6868	Quantitative methods	3
		PUBH 6884	Bioinformatics Algorithms and Data Structures	3
		PUBH 68xx	Electives	3
Year 2	Fall	PUBH 6886	Statistical and Machine Learning for Public Health Research	3
		PUBH 68xx PUBH 88xx	Electives	6
	Spring	PUBH 68xx PUBH 88xx	Electives	2-7
		PUBH 6897	Research in Biostatistics and Bioinformatics (minimum required) ⁵	1-4
		PUBH 6898	Master of Science Thesis (minimum required) ⁵	1-3

⁴ PUBH 6080 can be taken online during the first year of matriculation

⁵ PUBH 6897 and PUBH 6898 are offered in Spring, Summer, and Fall