Milken Institute School of Public Health THE GEORGE WASHINGTON UNIVERSITY	**Department of Biostatistics & Bioinformatics** **MS in Biostatistics** **2025-2026** Note: All curriculum revisions will be updated immediately on the website http://www.publichealth.gwu.edu

Program Director

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Mission

The mission of the MS program in Biostatistics is to train the next generation of leaders and practitioners in the application of statistics to public health and biomedical research. Students in the program develop the necessary practical skills for innovative and advanced methods for 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 biostatistical and data science resources at GWU and in the Nation's Capital. It is designed to prepare students to become independent biostatistical collaborators in interdisciplinary research settings such as those found in private industry, pharmaceutical companies, government organizations, academic institutions, and other organizations that employ biostatisticians and/or health data scientists. In addition, it aims to build a strong foundation for students interested in pursuing doctoral degrees in Biostatistics, Epidemiology, or other quantitative disciplines.

MS , Biostatistics Competencies

Upon completion of the MS program in Biostatistics, students will possess the following competencies.

1. **Statistical Programming**: Use statistical software to perform programming tasks for the purposes of statistical analysis of public health and biomedical data.
2. **Biostatistical Methodology**: Summarize and evaluate biostatistical methodology applied in public health and biomedical research.
3. **Communication**: Communicate principles of statistical theory and study design to interprofessional team members.
4. **Applied Statistics**: Apply the principles of biostatistical methodology to perform analyses of public health and biomedical data.
5. **Scientific Writing**: Develop components of the statistical analysis section of public health and biomedical research proposals.

Minimum Program Requirements

The program requires a total of 36 credit hours of course work and research, with a minimum of 35 credits of courses and a minimum of 1 credit of thesis research. Students in the program must hold an undergraduate degree from an accredited institution of higher learning and should have some background in mathematics. The minimum prerequisite for consideration of the application for admission is completion of two semesters of calculus and one semester of undergraduate statistics. The full prerequisite includes an additional semester of multivariable calculus and a semester of linear algebra. Applicants who have not met the minimum prerequisite will not be considered for admission. Applicants who have not met the full prerequisite can complete it according to one of the options below.

MS Program Prerequisites

Minimum Pre-requisite:

- Calculus I and II (GW equivalent is MATH 1231 and 1232)
- Undergraduate Statistics (GW equivalent is PUBH 2142 or STAT 1051)

Full Prerequisite: (in addition to above) not required for application but admission to the MS program will be provisional upon satisfactory completion of the courses below. Alternatives described below for applicants who have not met the full prerequisite.

- Multivariable Calculus (GW equivalent is MATH 2233)
- Linear Algebra (GW equivalent is MATH 2184)

Ideally, students who have not met the full prerequisite will have completed it as part of their undergraduate studies. However, the full prerequisite can also be completed according to one of the following options below:

- **Option 1**: Applicants who have not met the full prerequisite prior to matriculation can enroll in and successfully complete the courses MATH 2233 and MATH 2184 prior to or during their first semester in the MS Biostatistics program. MATH 2233 and MATH 2184 will not count for credit toward the degree. They must be completed with a minimum grade of B to gain full admission to the MS Biostatistics program.

- **Option 2**: Applicants who have not met the full prerequisite prior to matriculation can enroll in and successfully complete courses in Multivariable Calculus and/or Linear Algebra at another university prior to the first semester in the MS Biostatistics program. A transcript documenting completion with a minimum grade of B must be submitted to gain full admission to the MS Biostatistics program.

- **Option 3**: Applicants who have not met the full prerequisite prior to matriculation can enroll in and successfully complete courses in Multivariable Calculus and/or Linear Algebra through an online institution such as Coursera prior to the first semester in the MS Biostatistics program. A course certificate must be submitted to the Program Director and to the Admissions Office to be approved for full admission to the MS Biostatistics program.

Note: Applicants who have not met the full prerequisite will still be given full consideration for admission provided that the minimum prerequisite has been met.

All applications are submitted through 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 practical development of applied data analysis skills as well as coverage of specific biostatistical topic areas and issues in the conduct of biostatistical and medical research. The program requires a total of 36 credit hours of coursework including one credit for the Final Research Project or Master's Thesis.

Elective and selective courses are listed on the course requirements page. Students must register for at least three credits of selective courses from the list of options given. For elective courses, students may choose seven credits from any class that is pre-approved, or other classes may be chosen with prior approval of the program director. If a student takes more than three credits of selective courses, the difference can be used to meet elective requirements.

Course Distribution Summary	**Credits**
Required Courses	25
Elective and Selective Courses	10
Final Research Project or Master's Thesis (1 credit)	1
Total credits	**36**

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Course	Course Name	Semester	Credits
Required Core Courses (9 Credits)			
PUBH 6080	^Pathways to Public Health	Fall, Spring, Summer	0
PUBH 6862	Applied Linear Regression for Public Health Research	Fall	3
PUBH 6864	Applied Survival Analysis for Public Health Research	Fall	3
PUBH 6865	Applied Categorical Data Analysis for Public Health Research	Spring	3
Required Biostatistics Courses (16 Credits)			
PUBH 6866	Principles of Clinical Trials	Spring	3
PUBH 6867	Health Data Visualization	Spring	3
PUBH 6869	Principles of Biostatistical Consulting	Spring	1
PUBH 6886	Statistical and Machine Learning for Public Health Research	Fall	3
PUBH 6887	Applied Longitudinal Data Analysis for Public Health Research	Spring	3
PUBH 8870	Statistical Inference for Public Health Research I	Fall	3
Elective Courses - 7 Credits - Recommended Courses Shown Below. Other courses can be selected after discussion with advisor.			
PUBH 6850	Introduction to SAS	Fall, Spring	1
PUBH 6851	Introduction to R	Fall, Spring	1
PUBH 6852	Introduction to Python	Fall, Spring	1
PUBH 6854	Applied Computing in Health Data Science	Fall	3
PUBH 6856	Advanced SAS	Summer	1
PUBH 6860	Introduction to Bioinformatics	Fall	3
PUBH 6863	Applied Meta-Analysis	Fall	1
PUBH 8888	Advanced Topics in Clinical Trials	Fall	2
STAT 6197	Fundamentals of SAS Programming for Data Management	Spring	3
STAT 6215	Applied Multivariate Analysis	Spring	3
Advanced Biostatistics Selective Course — Choose 3 credits from the list below – Can also be used to meet elective requirements after 3 credits			
PUBH 8871	Statistical Inference for Public Health Research II	Spring	3
PUBH 8875	Linear Models in Biostatistics (permission of instructor required)	Spring	3
PUBH 8879	An Introduction to Causal Inference for Public Health Research	Spring	3
PUBH 6899	Neural Networks in Biomedical Research	Spring	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

Final Research Project – 1 credit from one of the following			
PUBH 6897	Research in Biostatistics and Bioinformatics	Fall, Spring, Summer	1
PUBH 6898	Master of Science Thesis *Only for students who wish to complete a formal thesis*	Fall, Spring, Summer	1

^ *Students without a prior degree from a CEPH-accredited program or school of public health are required to successfully complete the zero-credit, online course Pathways to Public Health (PUBH 6080) within one year of matriculation. There is no fee for this course*.

MS Graduation Requirements Graduation

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.

Graduation Requirements

1. **Credits**: Successful completion of 36 credits.

2. **Master's Thesis or Research Report:** Successful defense of a Master's Thesis or presentation of a Research Report.

3. **Grade point average**: A minimum overall grade-point average of B (3.0).

4. **Time Limit Requirement**: The degree must be completed within five years.

5. **Transfer Credits**: No transfer credits will be accepted.

6. **Pathways to Public Health**. Must be successfully completed unless waiver received.

7. **Ethics/Professional Skills Requirement:** Participate in department-led ethical and professional skills training.

8. **Professional Enhancement requirement**: Students must participate in 8 hours per degree program of advisor pre-approved Public Health-related lectures, seminars, symposia and/or conferences related to the appropriate field of study specifically focused on research and research ethics. Students must submit documentation of Professional Enhancement activities to the SPH Office of Student Records. Instructions can be found here: https://publichealth.gwu.edu/academics/forms

9. **CITI Training requirement**: All students are required to complete training regarding human subject protection regulation and the Health Insurance Portability and Accountability Act of 1996 (HIPAA). To fulfill this requirement, you must complete the Collaborative IRB Training Initiative (CITI) Course in The Protection of Human Research Subjects.

10. **Integrity Quiz & Plagiarism Requirement**: All students are required to review the George Washington University Code of Academic Integrity and take the quiz within their first semester of study. The Code of Integrity and step-by-step instructions can be found here: http://publichealth.gwu.edu/integrity

Sample Schedule for MS, Biostatistics

Year	Semester	Course	Title	Credits
Year 0	Summer	MATH 2233 and/or 2184 or equivalent	Multivariable Calculus and/or Linear Algebra (does not count toward the degree, not applicable to students who have completed the full prerequisite as described above)	6
Year 1	Fall	PUBH 6080	Pathways to Public Health	0
		PUBH 6862	Applied Linear Regression for Public Health Research	3
		PUBH 8870	Statistical Inference for Public Health Research I	3
		PUBH 6867	Health Data Visualization	3
	Spring	PUBH 6865	Applied Categorical Data Analysis for Public Health Research	3
		PUBH 6887	Applied Longitudinal Data Analysis for Public Health Research	3
		PUBH 6866	Principles of Clinical Trials	3
Year 2	Fall	PUBH 6886	Statistical and Machine Learning for Public Health Research	3
		PUBH 6864	Applied Survival Analysis for Public Health Research	3
		PUBH 68xx	Elective	3
	Spring	PUBH 6869	Principles of Biostatistical Consulting	1
		PUBH 68xx	Selective	3
		PUBH 68xx	Electives	4
		PUBH 6897 or PUBH 6898	Final Research Project	1
TOTAL CREDITS				**36**