# MASTER OF SCIENCE IN THE FIELD OF HEALTH DATA SCIENCE, BIOINFORMATICS CONCENTRATION

## PROGRAM DIRECTOR: M. PEREZ-LOSADA

The master of science in health data science program positions graduates to be leaders and practitioners in public health and medicine. Students choose one of two concentrations: biostatistics or bioinformatics. The program offers a unique blend of the two disciplines, which helps practitioners become successful leaders and collaborators in interdisciplinary research. Each concentration focuses on the foundations of the respective discipline to acquire fundamental knowledge and experience in the subject area while gaining core knowledge in the foundations of the other concentration.

**Bioinformatics concentration**

The bioinformatics concentration prepares students for work as data analysts, informaticians, or software developers with opportunities in governmental, academic, and private sector settings. Graduates are primed to pursue independent doctoral-level research at leading programs in bioinformatics and computational biology. Through this research, students gain an understanding of the risk factors for chronic diseases such as cancer and how infectious diseases, such as Zika, Ebola, HIV/AIDS, and COVID-19, spread and evolve.

Visit the program website (https://publichealth.gwu.edu/content/health-and-biomedical-data-science-ms/) for additional information.

## ADMISSIONS

Visit the Milken Institute School of Public Health website (https://publichealth.gwu.edu/) for additional information about academic programs and information about GWSPH. Graduate admissions information, including application requirements and deadlines, can be found on the GWSPH Graduate Admissions website (https://publichealth.gwu.edu/admissions/graduate-admissions/).

## REQUIREMENTS

The following requirements must be fulfilled: 36 credits, including 6 credits in core courses, 18 credits in concentration-specific courses, up to 10 credits in elective courses, and a minimum of 2 credits in research and thesis work.

| Code | Title | Credits |
|---|---|---|
| **Required** | | |
| Core courses | | |
| PUBH 6080 | Pathways to Public Health | |
| PUBH 6850 | Introduction to SAS for Public Health Research | |
| PUBH 6851 | Introduction to R for Public Health Research | |
| PUBH 6852 | Introduction to Python for Public Health Research | |
| PUBH 6860 | Principles of Bioinformatics | |
| Bioinformatics concentration-specific courses | | |
| PUBH 6859 | High Performance and Cloud Computing | |
| PUBH 6861 | Public Health Genomics | |
| PUBH 6854 | Applied Computing in Health Data Science | |
| PUBH 6868 | Quantitative Methods | |
| PUBH 6884 | Bioinformatics Algorithms and Data Structures | |
| PUBH 6886 | Statistical and Machine Learning for Public Health Research | |
| **Electives** | | |
| Up to 10 credits in pre-approved elective courses common to both program concentrations (bioinformatics and biostatistics) and/or courses limited to the bioinformatics concentration listed below. Other courses may be approved in advance by the advisor. | | |
| Electives options common to both the bioinformatics and biostatistics concentrations | | |
| PUBH 6853 | Use of SAS for Data Management and Analysis | |
| PUBH 6856 | Advanced SAS for Public Health Research | |
| PUBH 8885 | Computational Biology | |
| PUBH 6899 | Topics in Biostatistics and Bioinformatics | |
| PUBH 8875 | Linear Models in Biostatistics | |
| PUBH 8877 | Generalized Linear Models in Biostatistics | |
| STAT 6223 | Bayesian Statistics: Theory and Applications | |
| Elective options limited to the bioinformatics concentration | | |
| BIOC 6240 | Next Generation Sequencing | |
| CSCI 6221 | Advanced Software Paradigms | |
| CSCI 6231 | Software Engineering | |
| PUBH 6238 | Molecular Epidemiology | |

| | |
|---|---|
| PUBH 6244 | Cancer Epidemiology |
| PUBH 6262 | Introduction to Geographic Information Systems |
| PUBH 6263 | Advanced GIS |
| PUBH 6276 | Public Health Microbiology |
| PUBH 6278 | Public Health Virology |
| PUBH 6894 | Research Analytics |
| PUBH 8871 | Statistical Inference for Public Health Research II |
| PUBH 8878 | Statistical Genetics |
| **Research and Thesis** | |
| At least 1 credit taken in each of the following courses: | |
| PUBH 6897 | Research in Biostatistics and Bioinformatics |
| PUBH 6898 | Master of Science Thesis |