

# Milken Institute School of Public Health

THE GEORGE WASHINGTON UNIVERSITY

## Department of Biostatistics and Bioinformatics

### GW Undergraduate Students

### Minor in Bioinformatics 2021-2022

#### Background

The Minor in Bioinformatics requires 18 credits. Upon successful completion of all requirements, the title of Minor and the courses taken in support of the Field are entered on the student's transcript.

#### Program Director

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#### GWSPH Undergraduate Advisors

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#### Overview

The Milken Institute School of Public Health (SPH) offers the Minor in Bioinformatics. [Bioinformatics](#) is an interdisciplinary minor offering focused training that integrates concepts in health, biology, statistics, and computer science. The program develops and integrates skills across the core competency areas in bioinformatics, including computation, biology, statistics/mathematics, and foundational knowledge in bioinformatics. The Bioinformatics Minor consists of at least 18 credits (12 credits of required public health courses and six (6) credits of bioinformatics related elective courses). Students who complete this program enhance their core undergraduate program to add significant additional skills that aid in entry to the top graduate programs in bioinformatics and computational biology in the world, leading professional schools (including public health, law school, medical school, or dental school), or employment in public health, biotechnology, pharmaceutical, or software development companies.

**Admissions Requirements: 2.8 cumulative GPA or above.**

#### To Add or Drop a Minor and to Change the Original Program of Study

Please see the GWSPH Undergraduate Advisor or Program Director for information, to drop the minor, assistance in the selection of the elective course, and any amendment to the courses on the original program of study. GWSPH will not process requests to add a Minor in Bioinformatics during the registration period. To add the minor please complete this form: <https://publichealth.gwu.edu/academics/gwsph-undergraduate-declaration-form>

#### Note:

Students may double count approved elective credits for their major and towards the minor. Likewise, if their major requires a core minor course (e.g., PUBH 3201), then such a course can also be double counted. Electives courses must come from the approved list. Alternatives may be considered, but the student must petition the Program Director for any exceptions. Please see the Milken Institute SPH Undergraduate Advisor.

**Prerequisite Coursework**

<u>Required Course</u>	<u>Prerequisite(s)</u>
PUBH 3201	This course assumes a basic knowledge of biology (equivalent to BISC 1112, BISC 1116, or PUBH 2110).
PUBH 3202/4201	BISC 1111/1115 or 1112/1116, or equivalent
PUBH 4202	PUBH 4201 or equivalent (programming)

**Required Bioinformatics Courses**

Take all four courses - 12 credits

<b>Courses</b>	<b>Credits</b>	<b>Title</b>
PUBH 3201	3	Introduction to Bioinformatics
PUBH 3202	3	Introduction to Genomics
PUBH 4201	3	Practical Computing
PUBH 4202	3	Bioinformatics Algorithms and Data Structures

**Approved Bioinformatics Elective Courses**

Students may fulfill the elective requirement (6 credits) by taking any course on the Approved Bioinformatics Elective Course List shown below. Any course not on this list requires written approval by the Program Director in advance.

<b>Courses</b>	<b>Credits</b>	<b>Course Title</b>
ANTH 2406	3	Human Evolutionary Genetics
BISC 2207	3	Genetics
BISC 3209	3	Molecular Biology
BME 2820	3	Biomedical Engineering Programming I
BME 2825	3	Biomedical Engineering Programming II
BME 3820	4	Principles and Practice of Biomedical Engineering
CHEM 3165	3	Biochemistry I
CHEM 3166	3	Biochemistry II
CSCI 3212	4	Algorithms
CSCI 3221	3	Programming Languages
CSCI 4364	3	Machine Learning
CSCI 4572	3	Computational Biology
EMSE 3760	3	Discrete Systems Simulation
EMSE 3850	3	Quantitative Models in Systems Engineering
EMSE 4765	3	Data Analysis for Engineers & Scientists
MATH 3359	3	Introduction to Mathematical Modeling
MATH 3553	3	Introduction to Numerical Analysis
MATH 3613	3	Introduction to Combinatorics
MATH 3730	3	Computability Theory
MATH 3740	3	Computational Complexity
PUBH 3131	3	Epidemiology: Measuring Health and Disease
PUBH 3151(W)	3	Current Issues in Bioethics
PUBH 4199	1-3	Undergraduate Independent Study
PUBH 6859	3	High Performance and Cloud Computing
PUBH 6885	3	Computational Biology
STAT 2183W	3	Intermediate Statistics Lab/Packages

STAT 3119	3	Analysis of Variance
STAT 3187	3	Introduction to Sampling
STAT 4157	3	Introduction to Mathematical Statistics I
STAT 4188	3	Nonparametric Statistics Inference
STAT 4189	3	Mathematical Probability and Applications I