

MASTER OF SCIENCE IN THE FIELD OF BIOINFORMATICS AND MOLECULAR BIOCHEMISTRY

Students in the master of science in bioinformatics and molecular biochemistry program can choose to follow either a molecular biochemistry or a bioinformatics track.

Students pursuing the molecular biochemistry track take advanced biochemistry and molecular medicine courses as well as several hands-on laboratory techniques courses, gaining exposure to numerous laboratories and research initiatives.

Students selecting the bioinformatics track focus on the use of current bioinformatics technologies for analyzing high-throughput data from genomics and proteomics experiments. Course topics include leveraging big data for biomarker discovery in the era of personalized medicine, role of statistics in bioinformatics, gene function prediction, algorithm and software development. The bioinformatics program is one of the first in the United States devoted exclusively to teaching important genome-wide approaches to medicine and biology.

Each track offers the option of preparing a thesis by completing research at the George Washington University Medical Center, NIH, FDA, or Children's National Medical Center. Alternatively, the non-thesis program requires a hands-on practicum at participating institutions.

Upon graduation, students are prepared for careers in fields such as advanced biomedical research, genomics, bioinformatics, medicine, public health to law and policy.

Visit the School of Medicine and Health Sciences website for more information regarding the biochemistry (<https://smhs.gwu.edu/biochemistry-molecular-medicine/educational-programs/ms-biochemistry-track/>) and bioinformatics tracks (<https://smhs.gwu.edu/biochemistry-molecular-medicine/educational-programs/ms-bioinformatics-track/>).

This is a STEM-designated program.

ADMISSIONS

Admission Fall - April 1 deadlines:

Spring - October 1

Standardized GRE general test (institutional code 5246) test scores: recommended but not required.

The Test of English as a Foreign Language (TOEFL), the academic International English Language Testing System (IELTS), or the PTE Academic is required of all applicants except those who hold a bachelor's, master's, or doctoral degree from a college or university in the United States or from an institution located in a country in which English is the official language, provided English was the language of instruction.

Minimum scores for the program are:

- Academic IELTS: an overall band score of 6.0 with no individual score below 5.0; or

- TOEFL: 550 on paper-based or 80 on Internet-based; or

- PTE Academic: 53

Applicants to the program who do not meet minimum English language requirements may be eligible for our full-time Applied English Language program.

Recommendations: One (1) recommendation required:

Prerequisite courses, or equivalent: BIOC 3261; BISC 1111, 1112; CHEM 2122, 2151-52, 2153-54; PHYS 1011.

Prior academic records: Transcripts are required from all colleges and universities attended, whether or not credit was earned, the program was completed, or the credit appears as transfer credit on another transcript. Unofficial transcripts from all colleges and universities attended must be uploaded to your online application. Official transcripts are required only of applicants who are offered admission. If transcripts are in a language other than English, English language translations must be provided. The English translation alone should be uploaded into your application.

Statement of purpose: In an essay of 250 - 500 words, state your purpose in undertaking graduate study in your chosen field. Include your academic objectives, research interests, and career plans. Also discuss your related qualifications, including collegiate, professional, and community activities, and any other substantial accomplishments not already mentioned on the application. If you are applying for an assistantship or fellowship, you should also describe any teaching experience you have had.

International applicants only: Please follow this link - <https://columbian.gwu.edu/international-graduate-applicants> (<https://columbian.gwu.edu/international-graduate-applicants/>) - to review the International Applicant Information carefully for details on required documents, earlier deadlines for applicants requiring an I-20 or DS-2019 from GW, and English language requirements.

For more information on the admission process, please visit the Columbian College of Arts and Sciences Frequently Asked Questions (<http://columbian.gwu.edu/graduate/admissions/faqs/>) page.

Supporting documents not submitted online should be mailed to:

Columbian College of Arts and Sciences - Graduate Admissions Office
The George Washington University
801 22nd Street NW, Phillips Hall 215
Washington DC 20052

Contact for questions:

askccas@gwu.edu ~ 202-994-6210 (phone) ~ 202-994-6213 (fax)
8:30 am - 5:30 pm, Monday through Friday

REQUIREMENTS

The following requirements must be fulfilled:

The general requirements stated under Columbian College of Arts and Sciences, Graduate Programs (<http://bulletin.gwu.edu/arts-sciences/#degreeregulationstext>).

Code	Title	Credits
Required		
BIOC 6221	Proteins, Pathways, and Human Health	
BIOC 6222	Biochemical Genetics and Medicine	
BIOC 6223	Bioinformatics	
BIOC 6227	Biochemistry Seminar (taken twice for a total of 2 credits)	
Required for bioinformatics track		
BIOC 6236	Medical Genomics	
BIOC 6237	Proteomics and Biomarkers	
BIOC 6240	Next Generation Sequencing	
Required for biochemistry track		
BIOC 6224	Molecular Biology and Protein Methods	
BIOC 6260	Analytic Methods for Lipids and Carbohydrates	
Thesis option		
Required for students selecting the thesis option:		
BIOC 6998	Thesis Research	
BIOC 6999	Thesis Research	

Electives

Non-thesis option: 13 credits in elective courses.

Thesis option: 7 credits in elective courses.

Comprehensive examination

All students must pass, or be exempted from, a comprehensive examination.

Students who wish to pursue the thesis option should contact the department for details.