INDIVIDUALIZED GENOMICS AND HEALTH, MASTER OF SCIENCE

MS in Individualized Genomics and Health (https://advanced.jhu.edu/academics/graduate/ms-individualized-genomics-health/)

The Master of Science in Individualized Genomics and Health program prepares students for a career in the applications of bioinformatics tools in the health care field. This emerging field requires a workforce with multi-disciplinary skills in bioinformatics, bioscience, regulatory science, policy, and ethics. Students can meet their individual career goals through the selection of a concentration or get a more tailored experience by choosing their own set of six elective classes.

This 10-course degree program can be completed part time or full time, either online, or through a combination of onsite and online courses.

Admissions Criteria for All Advanced Academic Programs (https://e-catalogue.jhu.edu/arts-sciences/advanced-academic-programs/Admission/#admissionrequirementstext)

PROGRAM-SPECIFIC REQUIREMENTS

In addition to the materials and credentials required for all programs, the Master of Science in Individualized Genomics and Health requires an undergraduate degree in the biological sciences or engineering with a grade point average of at least a 3.0 on a 4.0 scale. Meeting the minimum GPA requirement does not guarantee admission. Additional requirements:

- **Resume**
- **Statement of Purpose:** Please provide a statement, up to one page in length, describing your personal background and/or a part of your life experience that has shaped you or your goals. Feel free to elaborate on personal challenges and opportunities that have influenced your decision to pursue a graduate degree at Johns Hopkins.
- **Program-Specific Prerequisite Courses:**
  - One semester of organic chemistry
  - One semester of biochemistry
  - One semester of cell biology
  - One semester of molecular biology
  - One semester of biostatistics

Program Requirements

Students in the MS in Individualized Genomics and Health program must complete ten courses:

- Six required core courses
- Four electives

Code	Title	Credits
Core Courses - Required:		**24**
AS.410.610	Epigenetics, Gene Organization & Expression	
AS.410.612	Human Molecular Genetics	
AS.410.629	Genes & Disease	
AS.410.633	Introduction to Bioinformatics	
AS.410.687	Ethical,Legal & Regulatory Aspects of the Biotechnology Enterprise	
AS.410.736	Genomic and Personalized Medicine	
Electives (Four required)		**16**
Total Credits		**40**

Electives

Choose any graduate-level course from the C (https://e-catalogue.jhu.edu/course-descriptions/_biotechnology/)enter for Biotechnology Education.

MS in Individualized Genomics and Health With Thesis Option

Students interested in pursuing the MS in Individualized Genomics and Health with the thesis are required to take 11 courses. The thesis requires a two-semester research project. Students complete AS.410.800 Independent Research in Biotechnology, and then AS.410.801 Biotechnology Thesis the following semester. Students interested in this option should consult with the program adviser.

Concentrations (optional)

Students wishing to focus on a specialized discipline within the MS in Individualized Genomics and Health program may enroll in one of three concentrations after being accepted into the program:

- Laboratory Diagnostics
- Genomics
- Regulatory

Laboratory Diagnostics

Code	Title	Credits
Select three of the following:		12
AS.410.641	Clinical & Molecular Diagnostics	
AS.410.656	Recombinant DNA Laboratory	
AS.410.671	Gene Expression Data Analysis and Visualization	
AS.410.780	Stem Cell Culture Laboratory Methods	
Total Credits		**12**

Genomics

Code	Title	Credits
Select three of the following:		12
AS.410.634	Practical Computer Concepts for Bioinformatics	
AS.410.635	Bioinformatics: Tools for Genome Analysis	
AS.410.671	Gene Expression Data Analysis and Visualization	
AS.410.709	Cancer Genomics	
AS.410.734	Practical Introduction to Metagenomics	
Total Credits		**12**

Regulatory

Code	Title	Credits
Select three of the following:		12
AS.410.627	Translational Biotechnology: From Intellectual Property to Licensing	
AS.410.648	Clinical Trial Design and Conduct	
AS.410.649	Introduction to Regulatory Affairs - Medical Products	
AS.410.651	Clinical Development of Drugs and Biologics	
AS.410.675	International Regulatory Affairs	
AS.410.676	Food And Drug Law	
AS.410.683	Introduction to cGMP Compliance	
Total Credits		**12**

Learning Outcomes

Graduates of the program should be able to:

- Employ the molecular and genetic basis for disease to explain the underlying causes
- Analyze big data sets to parse information and find patterns in data
- Apply statistical methods to large biological datasets
- Apply practices and skills from the various subfields of biotechnology
- Discuss the ethical issues surrounding human genetic research
- Develop skills to meet individual career goals in genomics and life sciences