DOCTOR OF PHILOSOPHY IN THE FIELD OF GENOMICS AND BIOINFORMATICS

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/#degeregulationtext).

The requirements for the Doctor of Philosophy program (http://bulletin.gwu.edu/arts-sciences/#doctoraltext).

72 credits, including required core and elective courses. Successful completion of a grant-style qualifier examination is required for advancement to candidacy. In addition, students perform full-time research in faculty laboratories for the duration of their program. In GW laboratories, they are hired as paid research assistants/associates in the third year and beyond of the program.

Students are advised to complete up to 48 credits comprising required interdisciplinary core courses, required genomics core courses, electives, and advanced readings and research in the first two years of PhD study. Upon successful completion of a grant-style qualifier, students register for up to 24 credits of dissertation research through completion and successful oral defense of a written dissertation.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BMSC 8210</td>
<td>Genes to Cells</td>
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<tr>
<td>BMSC 8212</td>
<td>Systems Physiology</td>
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<tr>
<td>BMSC 8215</td>
<td>Lab Rotations</td>
<td></td>
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<tr>
<td>BMSC 8216</td>
<td>Scientific Writing, Presentation Skills, and Seminar Planning</td>
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<tr>
<td>BMSC 8217</td>
<td>Ethics and Grant Writing</td>
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<tr>
<td>BMSC 8218</td>
<td>Career Options in the Biomedical Sciences</td>
<td></td>
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<tr>
<td>BMSC 8230</td>
<td>Molecular Basis of Human Disease</td>
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<tr>
<td>BMSC 8235</td>
<td>Applied Biostatistics for Basic Research</td>
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<tr>
<td>GENO 8231</td>
<td>Introduction to Genomics, Proteomics, and Bioinformatics</td>
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**Required interdisciplinary core**

- Genes to Cells
- Systems Physiology
- Lab Rotations
- Scientific Writing, Presentation Skills, and Seminar Planning
- Ethics and Grant Writing
- Career Options in the Biomedical Sciences
- Molecular Basis of Human Disease
- Applied Biostatistics for Basic Research

**Required genomics core**

- Introduction to Genomics, Proteomics, and Bioinformatics

**Electives**

24 credits elective courses selected in consultation with graduate program advisor:

- Clinically Oriented Human Embryology
- Clinically Oriented Human Microscopic Anatomy
- Clinically Oriented Human Functional Neuroanatomy
- Fundamentals of Translational Science
- Advanced Studies in Translational Sciences
- Next Generation Sequencing
- Bioscience Big Data Statistics
- Topics
- Metabolism
- Molecular and Cellular Signaling
- Writing the Grant-Style Qualifier
- The Basic Science of Oncology
- Molecular Oncology and Cancer Epigenetics
- Bioinformatics
- Medical Genomics
- Proteomics and Biomarkers
- Genomics and Precision Medicine Seminar
- Advanced Readings and Research
- Tropical Infectious Diseases
- Infection and Immunity
- Molecular and Cellular Immunology
- Advanced Topics in Immunology
- Foundations of Experimental Neuroscience I
- Foundations of Experimental Neuroscience II
- Pharmacogenomics and Personalized Medicine
- Pharmacology
- Advanced Pharmacology
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<tbody>
<tr>
<td>PHAR 6322</td>
<td>Advanced Professional and Communication Skills</td>
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<tr>
<td>PHAR 8211</td>
<td>Physiology</td>
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<tr>
<td>PHAR 8281</td>
<td>Molecular Pharmacology and Neurobiology of Excitable Tissues</td>
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<td>PUBH 6276</td>
<td>Public Health Microbiology</td>
</tr>
<tr>
<td>PUBH 6278</td>
<td>Public Health Virology</td>
</tr>
<tr>
<td>GENO 8999</td>
<td>Dissertation Research</td>
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**Dissertation research**

Required courses may be waived at the discretion of the graduate program director based on written documentation of prior equivalent coursework. Any waiver increases the number of electives required, by the number of credits waived.