The Doctor of Philosophy program in genetics requires a minimum of 72 s.h. of graduate credit. Students must maintain a cumulative grade-point average of 3.00. The program is designed to promote collaborative investigation and intellectual interaction among students and faculty participants affiliated with several different departments.

Students who enroll in the PhD program are encouraged to obtain a broad background in genetics, including molecular, population, and human genetics. Within this context, course requirements are flexible enough to permit students to tailor their formal coursework to their individual needs. All students are required to do some teaching as part of their development as future scientists and faculty members.

Students have the option to declare a PhD emphasis in computational genetics.

All students enrolled in the program are required to take the following courses.

<table>
<thead>
<tr>
<th>Course #</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENE:6150</td>
<td>Genetic Analysis of Biological Systems</td>
<td>3</td>
</tr>
<tr>
<td>GENE:6200</td>
<td>Special Topics in Genetics (seminar)</td>
<td>1</td>
</tr>
<tr>
<td>GENE:6210</td>
<td>Seminars in Genetics</td>
<td>1</td>
</tr>
<tr>
<td>GENE:6234</td>
<td>Basic Biostatistical Methods with Genetics Applications</td>
<td>1</td>
</tr>
<tr>
<td>BMED:5207</td>
<td>Principles of Molecular and Cellular Biology</td>
<td>3</td>
</tr>
<tr>
<td>BMED:7270</td>
<td>Scholarly Integrity/Responsible Conduct of Research I</td>
<td>0</td>
</tr>
<tr>
<td>BMED:7271</td>
<td>Scholarly Integrity/Responsible Conduct of Research II</td>
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One of these:

<table>
<thead>
<tr>
<th>Course #</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENE:7191</td>
<td>Human Molecular Genetics</td>
<td>3</td>
</tr>
<tr>
<td>BIOL:3172</td>
<td>Evolution</td>
<td>4</td>
</tr>
<tr>
<td>BIOL:3713</td>
<td>Molecular Genetics</td>
<td>4</td>
</tr>
<tr>
<td>BIOL:4333</td>
<td>Genes and Development</td>
<td>3</td>
</tr>
</tbody>
</table>

And these:

Elective coursework in molecular and microbial genetics, cell and development genetics, human genetics, or computational genetics 8
Seminar courses approved by the program 5

Even more important than formal coursework is the opportunity to do significant research in genetics. Research interests of the participating faculty include virtually all areas of genetics, ranging from bacteriophage genetics to human medical genetics. In each area of genetics, there is a group of faculty members who have closely related interests.

The university is strong in several related disciplines, including microbial physiology, enzymology, virology, protein biochemistry and molecular biology, computational genetics, and developmental and cell biology, all of which contribute significantly to the overall training program.

In addition to completing research and coursework, students must pass a comprehensive examination, usually at the end of their second year in the program.

Associated Courses

Credit earned in the following courses may be counted toward the PhD in genetics. Not all courses are offered every year.

<table>
<thead>
<tr>
<th>Course #</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENE:4213</td>
<td>Bioinformatics</td>
<td>4</td>
</tr>
<tr>
<td>BIOL:4386</td>
<td>Introduction to Scientific Computing for Biologists</td>
<td>3</td>
</tr>
<tr>
<td>BIOS:7330</td>
<td>Advanced Biostatistical Computing</td>
<td>3</td>
</tr>
<tr>
<td>BIOS:7700</td>
<td>Problems/Special Topics in Biostatistics</td>
<td>arr.</td>
</tr>
<tr>
<td>BMB:4310</td>
<td>Computational Biochemistry</td>
<td>3</td>
</tr>
<tr>
<td>BME:5335</td>
<td>Computational Bioinformatics</td>
<td>3</td>
</tr>
<tr>
<td>CS:5430</td>
<td>Machine Learning</td>
<td>3</td>
</tr>
<tr>
<td>EPID:5241</td>
<td>Statistical Methods in Epidemiology</td>
<td>4</td>
</tr>
<tr>
<td>EPID:6250</td>
<td>Genetics and Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>FRRB:7001</td>
<td>Molecular and Cellular Biology of Cancer</td>
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<tr>
<td>IGPI:6480</td>
<td>Knowledge Discovery</td>
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<tr>
<td>MICR:6268</td>
<td>Biology and Pathogenesis of Viruses</td>
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<tr>
<td>MMED:6220</td>
<td>Mechanisms of Cellular Organization</td>
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<tr>
<td>MMED:6226</td>
<td>Cell Cycle Control</td>
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<tr>
<td>MMED:6227</td>
<td>Cell Fate Decisions</td>
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<tr>
<td>NSCI:7235</td>
<td>Neurobiology of Disease</td>
<td>3</td>
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<tr>
<td>PCOL:6225</td>
<td>Growth Factor Receptor Signaling</td>
<td>1</td>
</tr>
<tr>
<td>STAT:4580</td>
<td>Data Visualization and Data Technologies</td>
<td>3</td>
</tr>
</tbody>
</table>

PhD and Dental Scientist Training Program

PhD students in genetics who have earned a DDS degree may be candidates for advanced training programs in dentistry. For information, contact the College of Dentistry.