Genetics, PhD

Requirements

The Doctor of Philosophy (PhD) 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.

An example of typical curriculum taken each semester can be found in the Sample Plan of Study located on MyUI.

The PhD in genetics requires the following coursework.

Core Courses

Course #	Title	Hours
All of these:		
GENE:6150	Genetic Analysis of Biological Systems	3
BMED:5207	Principles of Molecular and Cellular Biology	3
BMED:7270	Scholarly Integrity/ Responsible Conduct of Research I	0
BMED:7271	Scholarly Integrity/ Responsible Conduct of Research II	0
All of these, repeated each semester:		
GENE:6200	Current Topics in Genetics (seminar)	1
GENE:6210	Seminars in Genetics	1
GENE:7301	Graduate Research in Genetics	arr.
One of these:		
BIOS:4120	Introduction to Biostatistics	3
STAT:3510	Biostatistics	3
One of these:		
GENE:7191	Human Molecular Genetics	3
BIOL:3172	Evolution	4
BIOL:3713	Molecular Genetics	4
BIOL:4333	Genes and Development	3
And these:		
Elective coursework in molecular and microbial genetics, cell and development genetics, human genetics, or computational genetics; see following section for a list of pre-approved courses		7
Seminar courses approved by the program; see the following section titled "Pre-approved Seminar Courses"		3

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.

Pre-approved Elective Courses

Students complete at least 7 s.h. in elective coursework from the following list. Not all courses are offered every year. Other courses may be allowed with approval from the Curriculum and Graduate Affairs Committees.

Course #	Title	Hours
GENE:7191	Human Molecular Genetics	3
BIOL:3212	Bioinformatics for Beginners	3
BIOL:3713	Molecular Genetics	4
BIOL:4333	Genes and Development	3
BIOL:4386	Introduction to Scientific Computing for Biologists	3
BIOL:5172	Evolution - Graduate Lecture	3
BIOS:4510	Data Science Foundations in R	2
BIOS:7330	Advanced Biostatistical Computing	3
BIOS:7700	Problems/Special Topics in Biostatistics	arr.
BMB:4310	Computational Biochemistry	3
BME:5335	Computational Bioinformatics	3
CS:5430	Machine Learning	3
FRRB:7001	Molecular and Cellular Biology of Cancer	3
IGPI:5450	Machine Learning	3
IGPI:6480	Knowledge Discovery	3
MICR:6268	Biology and Pathogenesis of Viruses	2
MMED:6220	Mechanisms of Cellular Organization	3
MMED:6226	Cell Cycle Control	1
MMED:6227	Cell Fate Decisions	1
NSCI:7235	Neurobiology of Disease	3
PCOL:6225	Growth Factor Receptor Signaling	1
STAT:4580	Data Visualization and Data Technologies	3

Pre-approved Seminar Courses

Students complete at least 3 s.h. from the following seminar courses. Not all courses are offered every year. Other courses may be allowed with approval from the Curriculum and Graduate Affairs committees.

Course #	Title	Hours
ACB:6237	Critical Thinking in Biochemistry and Molecular Biology	1
ACB:6238	Critical Thinking in Genetics	1
ACB:6239	Critical Thinking in Cell Biology	1
ACB:6248	Critical Thinking in Development	1
ACB:6249	Critical Thinking in Cellular Physiology	1
BIOL:6188	Seminar: Writing in Natural Sciences	2
MMED:6280	Critical Thinking in Molecular Medicine	1

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.