

# Genetics, PhD

## Requirements

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.

Course #	Title	Hours
All of these:		
GENE:6150	Genetic Analysis of Biological Systems	3
GENE:6200	Current Topics in Genetics (seminar)	1
GENE:6210	Seminars in Genetics	1
GENE:6234	Basic Biostatistical Methods with Genetics Applications	1
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
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		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.

Course #	Title	Hours
GENE:4213	Bioinformatics	4
BIOL:4386	Introduction to Scientific Computing for Biologists	3
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
EPID:5241	Statistical Methods in Epidemiology	4
EPID:6250	Genetics and Epidemiology	3
FRRB:7001	Molecular and Cellular Biology of Cancer	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

## 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.