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  Special 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
IGP: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.