

# Genetics

## Chair

- Daniel Eberl (Biology)

**Graduate degree:** Ph.D. in genetics

**Faculty:** <https://genetics.grad.uiowa.edu/faculty-and-research/directory>

**Website:** <https://genetics.grad.uiowa.edu>

Prospective doctoral students in genetics should have a strong undergraduate background in science, including courses in general genetics, organic chemistry, biochemistry, introductory physics, and mathematics, as well as a strong commitment to genetic research and teaching. Students are able to make up deficiencies in a particular area during their first year of graduate study.

## Programs

### Graduate Program of Study

#### Major

- Doctor of Philosophy in Genetics

## Courses

### Genetics Courses

#### **GENE:4213 Bioinformatics 4 s.h.**

Overview of bioinformatics topics, including access to sequence data, pairwise and multiple sequence alignment algorithms, molecular phylogeny, microarray data analysis, protein analysis, proteomics and protein structure analysis; emphasis on each topic includes biological motivation, computational approach (practical and theoretical), and interpretation of output. Prerequisites: BIOC:3120 or MICR:3170 or BIOL:2512. Recommendations: grade of B+ or higher in BIOL:2512 or BIOC:3120, or graduate standing. Same as BIOL:4213, IGPI:4213.

#### **GENE:5173 Computational Genomics 3 s.h.**

Introduction to computational methods used in genome analysis and functional genomics; biological sequence analysis, sequence database search, microarray data analysis, biological network analysis; in-depth coverage of principal genome science challenges and recent solutions. Prerequisites: (BIOS:4120 or STAT:3510) and BME:5320 and (CS:5110 or ENGR:1300). Same as BIOL:5320, BME:5330, ECE:5220, IGPI:5330.

#### **GENE:6150 Genetic Analysis of Biological Systems 3 s.h.**

Genetic techniques and approaches for analysis of biological processes; comparison of strengths, weaknesses of a variety of experimental systems.

#### **GENE:6200 Special Topics in Genetics 1 s.h.**

Current research in a selected field of genetics; different topic each year. Companion to a genetics seminar series. Same as ACB:6200.

#### **GENE:6234 Basic Biostatistical Methods with Genetics Applications 1 s.h.**

Introduction to terminology, fundamental concepts, and methods of biostatistics as applied to genetic research; genetic investigation examples used to illustrate statistical approaches.

#### **GENE:6280 Directed Study in Genetics arr.**

#### **GENE:7191 Human Molecular Genetics 3 s.h.**

Molecular genetic approaches to human disease; the human genome project, linkage analysis, candidate gene screening, special features of inbred populations, triplet repeat expansions, mitochondrial genetics, genetics of complex traits. Requirements: fundamental genetics and molecular biology.

#### **GENE:7301 Graduate Research in Genetics arr.**