

2023-2024 Molecular Genetics & Genomics Concentration Worksheet

Major in Biological Sciences

To complete this concentration, Biological Sciences Majors may choose any 3 of the following courses:

- BIOL_SCI 332-0** **Conservation Genetics** - Critical issues in the management and understanding of endangered populations. *Prereqs: BIOL_SCI 203-0 OR ENVR_SCI 202-0.*
- BIOL_SCI 341-0** **Population Genetics** - Processes that affect allele frequency change and thus cause evolution. *Prereqs: BIOL_SCI 202-0, BIOL_SCI 203-0, and BIOL_SCI 337 or another course in statistics.*
- BIOL_SCI 353-0** **Molecular Biology Laboratory** - Project-based approach to learning lab skills in eukaryotic molecular biology. *Prereqs: BIOL_SCI 202-0, BIOL_SCI 203-0, BIOL_SCI 234-0, and BIOL_SCI 301-0.*
- BIOL_SCI 354-0** **Quantitative Analysis of Biology** - Random genetic processes, gene expression, cell adaptation, cell cycle, developmental morphogens, phylgenomics. *Prereq: BIOL_SCI 201-0 and BIOL_SCI 202-0.*
- BIOL_SCI 359-0** **Quantitative Experimentation in Biology** - Laboratory in experimental methods in quantitative biology. Random genetic processes, gene expression, cell cycle, developmental morphogens, genome sequencing. *Prereqs: BIOL_SCI 201-0 and BIOL_SCI 202-0, or BIOL_SCI 354-0.*
- BIOL_SCI 378-0** **Functional Genomics** - Patterns of gene expression and their causes. *Prereqs: BIOL_SCI 202-0 and BIOL_SCI 203-0.*
- BIOL_SCI 390-0** **Molecular Biology of Genome Editing and Engineering** - Nucleic acid structure; DNA mutation, repair, recombination, replication, restriction, and modification; translation. *Prereqs: BIOL_SCI 301-0.*
- BIOL_SCI 391-0** **Developmental Biology** - Molecular mechanisms underlying early embryonic development, including establishment of the body and organogenesis. Discussion of original literature. *Prereqs: BIOL_SCI 202-0, BIOL_SCI 203, and BIOL_SCI 301-0.*
- BIOL_SCI 392-0** **Developmental Genetics Laboratory** - Development of independent projects alongside classic readings and experiments exploring key concepts in developmental biology. *Prereqs: BIOL_SCI 202-0, BIOL_SCI 203-0, BIOL_SCI 234, and BIOL_SCI 301-0.*
- BIOL_SCI 393-0** **Human Genomics** - This course will examine how the analysis of the human genome and its variation provides insight into diversity, human health and our evolutionary history. *Prereqs: BIOL_SCI 203-0.*

- BIOL_SCI 395-0** **Molecular Genetics** - Exploration of recent advances that have revolutionized the fields of gene expression and cell regulation. Discussion of articles and primary research papers. *Prereqs: BIOL_SCI 202-0, BIOL_SCI 203-0, and BIOL_SCI 301-0.*
- BIOL_SCI 396-0** **Evolution and Diversity: Mushroom Genetics and Genomics** – The occurrence of natural genetic variation is the raw material with which evolution has sculpted every species that has ever existed. In this laboratory-based course, students are immersed in the world of a widespread and biologically famous mushroom-forming fungus. *Prereqs: BIOL_SCI 202-0, BIOL_SCI 203-0, and BIOL_SCI 301-0*