

# 2022-2023 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 215-0 OR ENVR\_SCI 202-0.*
- BIOL\_SCI 341-0**     **Population Genetics** - Processes that affect allele frequency change and thus cause evolution. *Prereqs: BIOL\_SCI 203-0 OR 215-0, BIOL\_SCI 202-0 OR 219-0, and a course in statistics.*
- BIOL\_SCI 353-0**     **Molecular Biology Laboratory** - Project-based approach to learning lab skills in eukaryotic molecular biology. *Prereqs: BIOL\_SCI 203-0 OR 215-0, BIOL\_SCI 202-0 OR 219-0, BIOL\_SCI 234-0 OR 222-0, 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 OR 215-0, BIOL\_SCI 202-0 OR 219-0.*
- 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 203-0, BIOL\_SCI 215-0, or BIOL\_SCI 354-0.*
- BIOL\_SCI 378-0**     **Functional Genomics** - Patterns of gene expression and their causes. *Prereqs: BIOL\_SCI 203-0 OR 215-0 and BIOL\_SCI 202-0 OR 219-0.*
- BIOL\_SCI 390-0**     **Advanced Molecular Biology** - Nucleic acid structure; DNA mutation, repair, recombination, replication, restriction, and modification; translation. *Prereqs: BIOL\_SCI 201-0 or 215-0, BIOL\_SCI 202-0 OR 219-0, and BIOL\_SCI 301-0.*
- BIOL\_SCI 391-0**     **Development and Evolution of Body Plans** - Molecular mechanisms underlying early embryonic development, including establishment of the body and organogenesis. Discussion of original literature. *Prereqs: BIOL\_SCI 203-0 OR 215-0, BIOL\_SCI 202 OR 219-0, 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 203-0 OR 215-0, BIOL\_SCI 202-0 OR 219-0, BIOL\_SCI 234 OR 222-0, 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 OR 215-0.*

- 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 203-0 OR 215-0; BIOL\_SCI 202-0 OR 219-0; 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 203-0 OR 215-0, BIOL\_SCI 202-0 OR 219-0, and BIOL\_SCI 301-0*