2023-2024 Computational and Systems Biology Concentration Worksheet
Major in Biological Sciences

To complete this concentration, Biological Sciences Majors must complete 1 coding sequence requirement and any 3 additional concentration courses from the list below:

**Coding Requirement**
- COMP_SCI 110-0
- OR
- COMP_SCI 111-0
- OR
- NICO 101-0 and NICO 102-0

**Biological Sciences and Related Courses**

- **BIOL_SCI 323-0**  [ ] Bioinformatics: Sequence and Structure Analysis  - Use of informational and modeling techniques to explore evolutionary and other problems related to the genome. Prereq: BIOL_SCI 241-0 OR BIOL_SCI 301-0.

- **BIOL_SCI 337-0**  [ ] Biostatistics  - Approaches, methods, and techniques for analyzing datasets in ecology and conservation biology. Prereqs: BIOL_SCI 203-0 OR 215-0 OR ENVR_SCI 202-0, and MATH 218-3 OR 220-2.

- **BIOL_SCI 345-0**  [ ] Topics in Biology: Principle's & Methods in Systems Biology  - This course uses current and classical literature to teach students about the major principles of systems biology. Prerequisites: BIOL_SCI 202-0, BIOL_SCI 203-0, and BIOL_SCI 234-0.

- **BIOL_SCI 354-0**  [ ] Quantitative Analysis of Biology  - Random genetic processes, gene expression, cell adaptation, cell cycle, developmental morphogens, phylgenomics. Prereqs: 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. Prereq: 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.

- **CHEM_ENG 379-0**  [ ] Computational Biology: Principles & Applications  - Introduction to the development and application of data-analytical and theoretical methods, mathematical modeling, and computational simulation techniques to the study of biological systems.

- **ES_APPM 495-0**  [ ] Topic: Introduction to the Analysis of RNA Sequencing Data  - This course will give an introduction to the theory and practice of analyzing high-throughput RNA sequencing through lectures and hands-on exercises.