2025-2026 Major in Biological Sciences

Computational and Systems Biology Concentration Worksheet

☐ Coding requirement for this concentration may be satisfied by COMP_SCI 110-0, COMP_SCI 111-0, or NICO 101-0 plus NICO 102-0. One unit of programming coursework may substitute for one of the two required 300-level Biol Sci electives.

Any three of the following 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. *Prereqs: BIOL_SCI 301-0.*

☐ **BIOL_SCI 337-0 Biostatistics** - Approaches, methods, and techniques for analyzing datasets in ecology and conservation biology. *Prereqs: BIOL_SCI 201-0, or BIOL_SCI 239-0, or ENVR_SCI 202-0, and MATH 218-3 or MATH 220-2.*

☐ **BIOL_SCI 338-0 Modeling Biological Dynamics** - Mathematical and computational techniques for analyzing and predicting biological dynamics. Techniques include statistical models, discrete- and continuous- time dynamical models, and stochastic models. Applications cover a range of scales, with an emphasis on common mathematical concepts and computational techniques, the interpretation of existing data, and making predictions for new experiments. *Prereqs: at least one of MATH 218-1, MATH 220-1, MATH 240-0, STAT 202-0, BIOL_SCI 337-0, OR equivalent.*

☐ **BIOL_SCI 354-0 Systems Biology** - Random genetic processes, gene expression, cell adaptation, developmental processes, genomics. *Prereqs: BIOL_SCI 201-0 and BIOL_SCI 202-0.*

☐ **BIOL_SCI 378-0 Functional Genomics** - Patterns of gene expression and their causes. *Prereqs: BIOL_SCI 202-0 or BIOL_SCI 240-0 and BIOL_SCI 203-0 and BIOL_SCI 241-0.*

☐ **CHEM_ENG 379-0 Computational Biology: Analysis and Design of Living Systems**

☐ **ES_APPM 495-0, when the topic is "Introduction to the Analysis of RNA Sequencing Data," is also eligible to be applied to this concentration.**