2025-2026 Major in Biological Sciences

Human Health and Disease Concentration Worksheet

Any three of the following courses:

☐ **BIOL_SCI 302-0 Fundamentals of Neurobiology** - Cellular and biochemical approaches to the nervous system, focusing on neuron structure and function. *Prereqs: BIOL SCI 202-0 or BIOL_SCI 240-0, 203-0 or BIOL_SCI 241-0, and BIOL_SCI 301-0. May not receive credit for both BIOL_SCI 302-0 and NEUROSCI 202-0.*

☐ **BIOL_SCI 310-0 Human Physiology** - An exploration of the functions of the human body at the tissue, organ, and organ system level. Emphasis on homeostatic mechanisms and interdependence within organs and organ systems and the influence of modulatory systems. Topics will include, but are not limited to: nervous, cardiovascular, respiratory, and renal systems. *Prereqs: BIOL_SCI 201-0 or BIOL_SCI 239-0, BIOL_SCI 202-0 or BIOL_SCI 240-0, and CHEM 132-0, CHEM 152-0, or CHEM 172-0.*

☐ **BIOL_SCI 319-0 Biology of Animal Viruses** - Virus structure, synthesis of viral nucleic acids and proteins, the interaction of the viral and cellular genomes. *Prereqs: BIOL_SCI 202-0 or BIOL_SCI 240-0, BIOL_SCI 203-0 or BIOL_SCI 241-0, and BIOL_SCI 301-0.*

☐ **BIOL_SCI 325-0 Animal Physiology** - Physiological principles and mechanisms responsible for the ability of animals to regulate variables in the steady state. Prereqs: BIOL SCI 202-0 or BIOL_SCI 240-0, 203-0 or BIOL_SCI 241-0, and BIOL_SCI 301-0.

☐ **BIOL_SCI 327-0 Biology of Aging** - Biological aspects of aging, from molecular to evolutionary. *Prereqs: BIOL_SCI 201-0 or BIOL_SCI 239-0, and BIOL_SCI 202-0 or BIOL_SCI 240-0.*

☐ **BIOL_SCI 328-0 Microbiology** - How microbes interact with their environments, including with humans. *Prereqs: BIOL_SCI 201-0 or BIOL_SCI 239-0, BIOL_SCI 202-0 or BIOL_SCI 240-0, BIOL_SCI 203-0 or BIOL_SCI 241-0, and have completed or be currently enrolled in BIOL_SCI 301-0*

☐ **BIOL_SCI 355-0 Immunobiology** - Nature of host resistance; characteristics of antigens, antibodies; basis of immune response; hypersensitivity. *Prereqs: BIOL_SCI 201-0 or BIOL_SCI 239-0, BIOL_SCI 202-0 or BIOL_SCI 240-0, and BIOL_SCI 301-0.*

☐ **BIOL_SCI 360-0 Principles of Cell Signaling** - Emphasis on principles, components, and logic that are common to different cell signaling systems. Modern experimental strategies for studying cellular signaling as well as the implications of disrupting cell communication pathways in disease will be described. *Prereqs: BIOL_SCI 202-0 or BIOL_SCI 240-0, and BIOL_SCI 203-0 or BIOL_SCI 241-0.*

☐ **BIOL_SCI 377-0 The Human Microbiome** - Course explores different communities of microorganisms in the human body – the gut, urogenital, oral, and skin microbiota, and how these communities contribute to or are altered in health and disease. Topics will include but are not limited to: the contribution of these communities to digestion and gut health, mood, obesity, the immune system, fertility and pregnancy, and neurological disorders. *Prereqs: BIOL_SCI 201-0 or BIOL_SCI 239-0, BIOL_SCI 202-0 or BIOL_SCI 240-0, and BIOL_SCI 301-0.*

☐ **BIOL_SCI 379-0 Proteomics and Disease** - Homeostasis of the proteome, and how breakdown of homeostatic mechanisms leads to disease. Topics include gene expression, the biochemistry of protein folding, the various pathways that ensure proper protein folding, and the destruction of mis-folded proteins and aggregates. Reading and discussion of primary literature; worksheets and problem sets in a collaborative learning environment. *Prereqs: BIOL_SCI 203-0, BIOL_SCI 234-0, and BIOL_SCI 301-0.*

☐ **BIOL_SCI 380-0 Biology of Cancer** - The disease of cancer: causation at the cellular and molecular levels; treatment. *Prereqs: BIOL_SCI 202-0 or BIOL_SCI 240-0, BIOL_SCI 203-0 or BIOL_SCI 241-0, and BIOL_SCI 301-0.*

☐ **BIOL_SCI 381-0 Stem Cells and Regeneration** - Developmental and molecular biology of tissue regeneration, with regard to regeneration from embryonic or adult stem cells. Discussion of conserved developmental pathways necessary for regeneration. Applications in regenerative medicine. *Prereqs: BIOL_SCI 202-0 or BIOL_SCI 240-0, and BIOL_SCI 203-0 or BIOL_SCI 241-0.*

☐ **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 or BIOL_SCI 240-0, and BIOL_SCI 203-0 or BIOL_SCI 241-0, and BIOL_SCI 301-0.*

☐ **BIOL_SCI 392-0 Morphogenesis** - Development of overarching principles alongside classic readings of experiments exploring key concepts in developmental biology. *Prereqs: BIOL_SCI 202-0 or BIOL_SCI 240-0, BIOL_SCI 203-0 or BIOL_SCI 241-0, BIOL_SCI 234-0, and BIOL_SCI 301-0.*