

**THE UNIVERSITY OF IOWA BIOLOGICAL SCIENCES
NEUROBIOLOGY SUBTRACK**

1. *Students lacking background equivalent to the following courses should enroll in at least two of these courses which they could have taken as an undergraduate.*

002:104 Introduction to Developmental Biology **3 s.h.**
Fundamental mechanisms to differentiation, organogenesis, morphogenesis and pattern formation; mechanistic approach at molecular, cellular, tissue levels of organization. **Prerequisites:** grade of C- or higher in 002:010, 002:011, and 004:012; none for graduate students.

002:114 Cell Biology **3 s.h.**
Structures of cells and organelles in relation to their functions at molecular, cellular levels; emphasis on higher eukaryotic cells. **Prerequisites:** 002:010 and 002:011, and 004:012 or equivalent; none for graduate students.

002:124 Animal Physiology **3 s.h.**
The course covers the fundamental principles of animal physiology, with an emphasis on the experimental and quantitative aspects of the science. Topics covered include membrane transport and cellular energetics, nerve and muscle physiology, intracellular signaling, osmoregulation, cardiovascular physiology, respiration, immunology, and neurophysiology. **Prerequisites:** 002:010, 002:011, and college physics

2. *Both of the following lecture-based courses or their equivalent (Equivalency to be assessed by the NGT Faculty):*

156:201 Principles in Molecular and Cell Biology **4 s.h.**
Foundation for understanding basic principles of molecular and cell biology relevant to all bioscience disciplines and teaches students how to evaluate literature critically.

002:180 Fundamental Neuroscience **4 s.h.**
Neuronal function, plasticity, and development at the systems and cellular levels. **Prerequisites:** 002:010 and 002:011; none for graduate students. **Recommended:** 029:012 and 099:110, or equivalents. Same as 132:180.

3. *One of the following lecture-based courses (2 if both of the requirements listed in part 2 have been completed prior to enrolling):*

002:181 Neurophysiology **3-4 s.h.**
Physiological properties of nerve cells, nervous systems; axonal conduction, synaptic transmission, sensory transduction, integrative processes, higher functions. **Prerequisites:** 002:180, 22M:025 or equivalent, and 029:012; or consent of instructor. Same as 132:181.

132:246 Developmental Neurobiology **3 s.h.**

Major developmental systems, their application in neurobiology; neurogenesis, synapse formation, axonal guidance, the cellular/molecular aspects of neural differentiation; literature-based approach. Consent of course director required. Same as 072:245.

132:241 Behavioral and Cognitive Neuroscience I **4 s.h.**

This course covers basic concepts, methods, and findings in behavioral and cognitive neurosciences. Emphasis is on principles of neuroscience, sensation, motivation, and emotion. Consent of course director required. Same as 031:241.

4. One 2 s.h. advanced seminar course with a writing component chosen from the following list each year after declaring the track. At least three of which must be 02:195 Topics in Neurobiology.

002:195 Topics in Neurobiology **2 s.h.**

Topics rotate, for example: Cell Death in Shaping the Nervous System, Axonal Guidance, Adhesion Molecules in the Nervous System, Insect Reproduction, Learning and Memory.

002:194 Topics in Cell and Development **2 s.h.**

Topics rotate, for example: Signal Transduction Mechanisms, Cell Determination and Transcriptional Regulation, Cell-Cell and Cell-Substrate Interactions, and Cell Division.