Neurobiology

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Description: One of the greatest challenges of our time is to reverse engineer the brain. Meeting this challenge will depend on knowledge and intellectual approaches stemming from the discipline of biological engineering. The BE Department's neuroscience concentration offers students a strong set of specialized elective courses in neuroscience and neuroengineering, as well as research opportunities at the cutting edge of neurotechnology development. Relevant courses are taught by BE instructors as well as by departmental partners at MIT. To complement classroom work, numerous BE laboratories give students the chance to get involved in creation of next-generation tools for experimental investigation of the nervous system, strategies for engineering neurons and neural tissue, and development of new approaches for treating brain disorders and enhancing neural function. In addition, BE co-hosts the MIT Center for Neurobiological Engineering, which involves many BE labs and sponsors seminars and symposia about innovative neurotechnology and its applications in health and disease, all open to interested undergraduates.

Guide for class selection: Students may choose restricted electives according to their individual interests, but should be guided in doing so by the prerequisites of the courses listed. Many of the classes require 9.01 as a prerequisite; this class is highly recommended to all students in the Neurobiology Concentration, and it would count as an unrestricted elective.

Restricted Electives

6.021J/20.370J Quantitative Physiology: Cells and Tissues (U)
Prereq: Physics II (GIR); 18.03; 2.005, 6.002, 6.003, 6.071J, 10.301, 20.110J, 20.111J, or permission of instructor

7.29J/9.09J Cellular and Molecular Neurobiology (U)
Prereq: 7.05 or 9.01

9.07 Statistics for Brain & Cognitive Science (U)
Prereq: 9.40

9.29J/8.261J Introduction to Computational Neuroscience (U)
Prereq: 18.03, Physics II GIR, or permission of instructor

9.40 Introduction to Neural Computation (U)
Prereq: 6.0002, 9.01

9.66J/6.804J Computational Cognitive Science (U)
Prereq: 9.40, 18.05, 18.600; or permission of instructor

20.203J/9.123J Neurotechnology in Action (G)
Prereq: Permission of instructors

20.205J/9.26J Principles and Applications of Genetic Engineering for Biotechnology and Neuroscience (U)
Prereq: 7.28, 7.32, or 20.020; 9.01 or 9.09

Prereq: Permission of instructor