

August 23, 2001

MEDS 370 -- INTRODUCTORY NEUROSCIENCE

This 1-credit lecture course is designed for all entering students in the Neuroscience Ph.D. program, and it provides crucial background for all other courses in neuroscience. In addition, it is suitable for any first-year or more advanced graduate student in a Ph.D. program in Biomedical Sciences. This course provides a general introduction to the whole field of neuroscience as a discipline, to the important concepts and problems unique to the nervous system, and to selected current research in neuroscience. The course will be given during the fall semester (1 hr/week) every year.

The nervous system consists of the brain, spinal cord, and peripheral nervous structures. Our scientific understanding of sensation, movement, behavior, homeostatic systems, and cognition each require knowledge and understanding of the nervous system. This course will provide the student with an introduction to the neurobiological bases of these functions and the experimental approaches that underlie modern neurobiological research. The course will also introduce the student to the unique cell and molecular biology of the nervous system. Neuroscience, as a discipline, incorporates findings and concepts from many other scientific fields in order to address fundamental problems. Therefore, one goal of the course is to show how our understanding of the nervous system requires the integration of data from disciplines like endocrinology, genetics, computational biology, engineering, psychophysics, and biophysics. In addition, this course will introduce common diseases of the nervous system. The study of diseases is instructional because understanding dysfunction often helps to explain normal function. More importantly, the cure of diseases, such as stroke, Alzheimer's disease, and multiple sclerosis, provide a strong motivation for research in the nervous system.

A first-half and a second-half exam will consist of essay or short answer questions in a take-home format.

Textbooks: Kandel, Schwartz, Jessell (2000) Principles of Neural Science. McGraw-Hill. 4th Ed. McGraw Hill; or Purves (2001) Neuroscience. 2nd Ed. Sinauer; or Zigmond (1999) Fundamental Neuroscience. Academic Press.

Course directors: L. Bernstein, D. Oliver, R. Mains

SCHEDULE: Friday lectures; 9-10 AM, ARB EG-052

Semester is August 20, 2001 – December 24, 2001

Date	Topic	Lecturer	Pages in <u>Principles</u>
Aug. 24	Brains, Cells, Genes, and Neurotransmitter Release	Mains	5-86; 175-185; 253-277
	Cell and Molecular Biology of the Nervous System		
Aug 31	Ionic Basis of the Resting and Action Potentials	Mains	19-32;105-169;1280-1285
Sept. 7	Molecular Biology of Ion Channels; Mutations of Ion Channels; Epilepsy	Reenan	105-169
Sept. 14	Neurotransmitters	Eipper	
Sept. 21	Postsynaptic Events	Levine	
Sept. 28	Modulation of Synaptic Function	S. Hewett	
Oct. 5	Glial Cells	Pfeiffer	
	Development of Nervous System		
Oct. 11	Early development NOTE DAY THURSDAY and time 3 p.m. due to Neuroscience Retreat Oct. 12	Maxwell	1019-1030; 1040-1060
Oct. 11	****First half take-home exam given out ****		
Oct. 12	****No class, Neuroscience retreat*****		
Oct. 19	First half take-home exam due		
Oct. 19	Specification and differentiation in the CNS	Morest	
	Neural Basis of Perception, Cognition, and Movement		
Oct. 26	Auditory System; Deafness; Language; Aphasia	Kuwada	
Nov. 2	Sensory and Motor Systems in Spinal Cord; Paralysis	Oliver	663-672;713-735
Nov. 9	NO CLASS-Soc Neurosci Meeting in San Diego Nov. 10-15		
Nov. 16	Sensory Processes and Perception in Humans	Bernstein	411-428
Nov. 23	No CLASS Thanksgiving Holiday		
Nov. 30	Visual System; Blindness	Oliver	
Dec 7	Perception & movement & the cerebral cortex	Potashner	317-326; 337-348
Dec.14	Association areas of the cerebral cortex and cognitive capabilities of the brain	Deckel	349-379
Dec. 14	****Take-home exam given out****		
Dec. 21	Take-Home Second Half Exam Due		