NRO C69F The Synaptic Organization of the Brain

Fall, 2003; Room B-382; F 1-3 p.m.

Instructor: Professor Gwen O. Ivy
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Office Hours: T 5-6, TH 5-6, F 3-4 or by appointment
NOTE: T and TH, I teach in S319 until 5:00 p.m. and may be detained there by students asking questions.

COURSE DESCRIPTION

Synaptic organization may be defined as the study of principles underlying the organization of neurons and synapses into circuits that mediate the functional operations of different brain regions. It is a multidisciplinary subject, requiring the integration of results from studies in molecular neurobiology, neuroanatomy, neurophysiology, neurochemistry, neuropharmacology, development and behavior, as well as theoretical studies of computational neural models and neuronal networks. It is also a multilevel subject, beginning with the properties of the individual synapse and building up through microcircuits and neurons to the local circuits characteristic of a given region and finally, to the interactions between various circuits that form a given system, and even to system-system interactions. Such multi-system interactions must surely underlie complex thought processes such as art, music and science appreciation, analytical thinking, creativity and self-awareness!

TEXT

The Synaptic Organization of the Brain. Fourth Edition. Gordon M. Shepherd (ed.), Oxford University Press, New York, 1998.

ORGANIZATION

The course will meet weekly for two hours and will consist of lectures by the instructor and extensive class discussions. The textbook will be the major source of information, supplemented by illustrations and concepts provided by the instructor in class.

EVALUATION

*Midterm Exam - Week of Oct. 20, TBA by Registrar, 2hrs (multiple choice, short answer, label diagrams, draw circuits)	30%
*Final Exam - Final exam period, TBA by Registrar, 3hrs. (same format as midterm; emphasis placed on material after midterm)	40%
Term Paper - Due Dec. 1 (Last day of class) Fifteen pages, topic of your choice approved by instructor Possible topics will be provided. Format will be provided	30%

*Exam questions will be taken from both the book and the lectures.

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Schedule of Topics

DATE :			TOPIC :
F	Sept.	12	Introduction to the course Begin Chapter 1: Introduction to synaptic circuits
F		19	Chapter 1
F		26	Chapter 2: Membrane properties and
F	Oct	3	Chapter 2: (cont'd.)
F		10	Chapter 2 : (cont'd.)
F		17	Chapter 5: Olfactory Bulb
			MIDTERM: week of Oct. 20, TBA by Registrar, 2hrs
F		24	Chapter 5 : (cont'd.)
F		31	Chapter 7: Cerebellum
F	Nov	7	Chapter 7: (cont'd.)
F		14	Chapter 11: Hippocampus
F		21	Chapter 11: (cont'd.)
F		28	Chapter 11: (cont'd.)
M	Dec.	1	Last day of class, **Term paper due**
F	Dec 9 - 19		Final exam period, date TBA 40% of grade