

BIOLOGY 447-002: SYSTEMS NEUROBIOLOGY

INSTRUCTOR:	Dr. Farzan Nadim	EMAIL:	farzan@njit.edu
OFFICE:	Central King Bldg.	OFFICE HOURS:	T, R: 9:00AM - 10:00AM
COURSE SCHEDULE:	T, R: 10:00AM – 11:25PM ▪ CKB 217	COURSE WEBSITE:	http://moodle.njit.edu/

COURSE DESCRIPTION: This course will examine neurophysiological phenomena from the systems perspective. After reviewing the basic concepts of cellular neuroscience such as excitability, impulse conduction, we focus on the integration of activity at the network level. The goal is to provide the basic knowledge to understand neurobiological processes at the systems level.

TEXTBOOK:

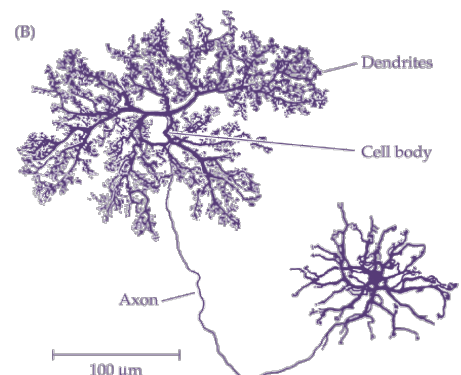
- ⊕ Neuroscience (Fifth Edition); Dale Purves, et al Editors, Sinauer Associates © 2012; **eText:** ISBN-10: 0-87893-587-8, ISBN-13: 978-0-87893-587-1; **Print:** ISBN-10: 0-87893-695-5, ISBN-13: 978-0-87893-695-3.

LEARNING OUTCOMES:

1. Describe the cellular structure of the nervous system and the general organization of the central and peripheral nervous system
2. Understand the electrical properties of neurons and how action potentials are generated and propagate along axons
3. Describe the mechanisms of neural interaction through synaptic transmission
4. Describe the principles of sensory transduction
5. Describe the principles of motor function
6. Understand how neural networks can lead to the production of sensory perception, motor behavior and higher level functions such as learning and memory
7. Describe the development of the nervous system and the basic principles of neural plasticity

IMPORTANT RULES AND COURSE POLICIES:

- ⊕ **Academic Integrity:** The [Academic Integrity Code](#) strictly enforced!
- ⊕ **Electronic Devices:** The use of cell phones and other electronic devices during class or exam times is prohibited.
- ⊕ **Make-Up Exams and Quizzes:** There will be no make-up exams or quizzes. Students who miss an exam due to a valid medical excuse will need to provide a doctor's note. The grade of any missed exam resulting from a verifiable valid excuse will be determined on a case-by-case basis. Any missed exam or quiz, with a valid excuse, will be calculated based on the student performance in other quizzes and exams.



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GRADING POLICY: The final grade in this course is determined as follows:

GRADE SCALE:					
A	93-100	C	60-66	Quizzes:	24%
B+	84-92	D	51-59	Midterm Exams:	23% each
B	75-83	F	0-50	Final Exam:	30%
C+	67-74				

COURSE OUTLINE:

WEEK	DATES	TOPICS
1	Jan. 19 Jan. 21	Basic Properties of Neurons / The Membrane Potential
2	Jan. 26 Jan. 28	The Resting Membrane, Ion Channels and Transporters
3	Feb. 2 Feb. 4	Action Potentials; The Hodgkin-Huxley Formalism; Propagation; Quiz 1
4	Feb. 9 Feb. 11	Synaptic Transmission, Excitation and Inhibition
5	Feb. 16 Feb. 18	Neurotransmitters and Receptors; MIDTERM 1
6	Feb. 23 Feb. 25	Synaptic Plasticity; Functional Organization of the Nervous System
7	Mar. 1 Mar. 3	Somatic Sensory System: Touch and Proprioception; Pain
8	Mar. 8 Mar. 10	Vision: the Eye and Transduction of Light ; Central Visual Processing; Quiz 2
9	Mar. 15 Mar. 17	SPRING BREAK – MARCH 13-20, 2016
10	Mar. 22 Mar. 24	The Auditory System: the Ear & Transduction of Sound; Central Auditory Processing
11	Mar. 29 Mar. 31	The Olfactory System; MIDTERM 2
12	Apr. 5 Apr. 7	Lower Motor Systems; Upper Motor Systems
13	Apr. 12 Apr. 14	Development of the Nervous System (Dr. Friedman); Basal Ganglia (Dr. Koos)
14	Apr. 19 Apr. 21	Central Pattern Generation; Sleep 1
15	Apr. 26 Apr. 28	Sleep 2; Learning and Memory
16	May 3	Classes Follow a Friday schedule NO CLASSES
FINALS		FINAL EXAM WEEK: MAY 6-12, 2016