

Systems Neurobiology Fall 2019 (AN-810, BI-755 & NS-700)

Course in a Nutshell Syllabus

Instructors Drs Jerry Chen and Doug Rosene; Teaching Fellows Renee Devivo & Scott Knudstrup

Tues 3:30 - 6:00 CRC LSE - 304; Thur 3:30 - 6:00 BUMC L-1008

Updated 11/25/19				Class Topics	Instructor	* = Textbook & Other Readings for Quiz # Paper for Writing Assignment & Discussion
Wk	#	Day	Date			
1	1	Tues	09/03/19	1: Introduction 2: Cytology of Neurons & Glia	Rosene	Purves Chpt 1 & Begley (2013) Six Red Flags for Suspect Work (No Quiz)
	2	Thur	09/05/19	1: Function & Neuroimmunology of Glia 2: Discussion	Trecartin	Paper - Hines (2015) Neuronal Activity Biases Axon Myelination-NatNeuro Discussion Only - No Paper
2	3	Tues	09/10/19	1&2: Electrical Properties of Neurons & Synaptic Processing	Chen	*Purves Chpts 2, 3 & 4
	4	Thur	09/12/19	1. Channels & Transporters 2. Discussion	Chen	#Paper-Beaulieu-Laroche et al. Dendritic Compartmentalization Cell 2018 175(3): 643-651.
3	5	Tues	09/17/19	1&2: Synaptic Transmission, Neurotransmitters and Receptors	Chen	*Purves Chpts. 5, 6 & 7
	6	Thur	09/19/19	1. Molecular Signaling & Gene Regulation 2. Discussion	Chen	#Paper- Watanabe et al. Ultrafast endocytosis at Hippo Synapses Nat 504:242. 2013
4	7	Tues	09/24/19	1 & 2 Synaptic Plasticity & Molecular Tools	Chen	*Purves Chpt 8 plus two "optional" background papers: Fenno et al and Flytzanis et al
	8	Thur	09/26/19	1: Tract Tracing 2: Discussion	Chen	#Paper- Pastyuzyn et al, (2018) Neuronal Gene Arc & Intercellular RNA transfer Cell 173(1): 275 -
5	9	Tues	10/01/19	1: Overview of Neuroanatomy-1 2: Overview of Neuroanatomy-2	Rosene	*Purves Neuroanatomy Appendix pp A1-31 & Neuroanatomy Atlas pp. AT1-17.
	10	Thur	10/03/19	1: Overview of Neuroanatomy-3 2: Neuroanatomy Wet Lab	Rosene	#Paper-Hill-Imaging Myelin Plasticity NatNeuro 2018 Wet Lab in Place of Discussion. Review Lab Guide
6	11	Tues	10/08/19	1: Cortex-1 Morphology 2: Cortex-2 Thalamus & Development	Rosene	*Purves Chpt 27, Chpt 33 & Chpt 34
	12	Thur	10/10/19	1: Chemosenses - Olfaction and Taste 2: Discussion	Davison	*Purves Chpt 15 and Wilson & Mainen Ann Rev Neurosci 2006; #Paper Chu et al,
7	---	Tues	10/15/19	Columbus Day = Monday Schedule - No Tuesday Class	-----	-----
	13	Thur	10/17/19	1: Cortex-3 Neurophysiology 2: Discussion	Medalla	#Paper - Yamawaki et al, Motor Crtx Layer 4, 2014.
8	14	Tues	10/22/19	1: Sensory Receptors 2: Somatosensory	Rushmore	*Purves Chpt 9 & 10, pp 189-228
	15	Thur	10/24/19	1: Pain 2: Discussion	Rushmore	#Paper - Mishra & Hoon (2013) Cells & Circuitry for Itch Responses in Mice Sci 340: 968
9	16	Tues	10/29/19	1&2: Vision - Retina	Toth	*Purves Chpt 11 & *Required Supplemental Papers 1) Kolb2003 and 2) Masland 2001
	17	Thur	10/31/19	3: Vision - Retina 4: Discussion	Toth	#Paper - James+Lognado Rate & Amplitude Coding in Bipolar Cells NatNeurosci-2019.pdf
10	18	Tues	11/05/19	1&2: Vision- LGN & Striate cortex	Toth	*Purves Chpt 12 & *Required Supplement Paper - Sprague 1966
	19	Thur	11/07/19	1: Vision-Extrastriate Cortices 2: Discussion	Toth	#Paper - Mock et al. Attention Signalling in V1 & LGN J Neurophys 120:1625 2018
11	20	Tues	11/12/19	1: Auditory & Vestibular Receptors 2: Central Auditory & Vestibular	Chen & Rosene	*Purves Chpt 13 & 14
	21	Thur	11/14/19	1: Motor-1 Muscle & Lower Motoneurons 2: Motor-2 Spinal & Brainstem Systems	Rosene	*Purves Chpt 16 & 17 and Chpt 20
12	22	Tues	11/19/19	1: Motor-3 Motor Cortices 2: Basal Ganglia	Rosene	*Purves Chpt 18 & 19
	--	Thur	11/21/19	1: Cerebellum 2: Discussion	Rosene	#Paper - Ferrari et al, Limbic vs Sensory Motor Mirror Neurons Neurosci 2017
13	23	Tues	11/26/19	1: Autonomic Motor System 2: Hypothalamus	Rosene	Purves Chpt 21, Chpt 24 & Chpt 31
	24	Thur	11/28/19	No Class - Thanksgiving	-----	-----
14	25	Tues	12/03/19	1: Limbic System-1 2: Limbic System-2	Rosene	*Purves Chpt 29 & Chpt 30 Also Review Optional Supplemental Chpts from Haines & from Bear
	26	Thur	12/05/19	1: Limbic System-3 Neurophysiology 2: Discussion	Danneberg	#Paper - Brandon et al Science 2011 Theta & grid cell periodicity .pdf
15	27	Tues	12/10/19	1: Development 1 2: Development 2	Haydar	*Chpt 22, Chpt 23, Chpt 25& *Required Supplement - Steiss 2010 & Amato (2011) for Background
	28	Thur	12/12/19	1: Systems-level brain function with fMRI 2: Discussion	Zajac	#Paper - Andrews-Hanna - Functional-Anatomic Fractionation of the Brain's Default Network Cell 2010
16	--	Tues	12/17/19	Final Exam Week	TBD*	Inadequate Discussion Participation or Paper / Quiz Performance -----> Final Exam or Term Paper
	--	Thur	12/19/19	Final Exam Week	TBD*	Grades Due Dec 20

Required: Purves et al, Neuroscience, 6th Ed, 2017 Get 20% off order with code Vanden2018 at www.oup.com/us/he

***Weekly Reading & Quizzes in Purves Textbook &/or Supplementary Readings. *Quiz on Readings and prior week's lectures at start of class Tuesday!**

#Topical Article & Writing Assignment: A 2 pg Summary and Critique of the assigned paper is due at the beginning of class each Thursday!

Discussion: Oral critique & discussion of the assigned Topical Article in the 2nd hour each Thursday. Random student called on for 5 min starting summary.

Term Paper (15 - 20 pg) if Discussion or Total Performance is Inadequate - not extra credit. Feedback to students week 6 & 12 with d

Supplementary Methods: Links to pertinent neuroscience methods are provided in Blackboard Course Info for background on latest methodology - consult as needed.