Introduction to Neurobiology (6-20-17)
GBS 730/PY791-SA/PY420_SA
Dauphin Island Sea Lab
July 17-Aug 3rd, 2015
Text: *Neuroscience*: Dale Purves et al., Editors. Sinauer Associates. Fifth Edition

Course Director
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Students will learn the fundamental basis of neuronal communication; how to maintain a lab notebook that includes hypothesis, methods, and results; and to collect, analyze and draw conclusions from experimental data.

Lectures: There will be roughly two hours of lecture each morning from 9:00-11:00 for the first two weeks. The rest of the morning should be spent reading the lab handouts and configuring your set-ups for the afternoon's experiments. There will also be lectures and review sessions in the evenings, as well as some lab demonstrations.

Simulation exercises: The simulation program will help to illustrate basic principles of neurophysiology and neural networks. The program allows the exploration of aspects of cellular neurobiology that time and equipment won't allow in a brief introductory course. Besides which, it's fun!

Lab Reports: Each student will keep a notebook of their lab work, which will be inspected (10 points total). Using the notebook, each student will submit lab reports on two of the wet lab exercises (15 points each). The selection of which exercises to write up should be based upon such criteria as which data set you feel is the cleanest or which lab you found most interesting. Each student will prepare a report answering specific questions based on the Simulation exercises for 10 points.

Exams: There will be two straightforward quizzes worth 50 points each that will cover lecture material ***and*** the assigned readings in the text.

The following schedule is tentative. Changes will likely be made as we go along.

Please note: If you are registered with Disability Support Services, please make an appointment as soon as possible to discuss the accommodations that you wish to request for this course. If you have a disability but have not contacted Disability Support Services, you must register through the website, https://www.uab.edu/students/disability/, email at dss@uab.edu or call at 934-4205 to receive DSS accommodations.

Sunday July 16 **Travel day.**	**Welcome! Check into your dorm and check in at Administration to get your ID made.** **Get settled, walk around a little, look at the water.** **Dinner is 5 – 6:30pm in the cafeteria, next to your dorm.** **Remember that we are guests here.**			
	Morning *Lectures*	**Readings & handouts**	**Afternoon** *Laboratory exercises*	**Evening**
Monday July 17th	DISL orientation Neurons and glia, Nernst & GHK eqns	Chapters 2, 3	Resting membrane potentials	Optional review
Tuesday July 18	**Lecture:** Action potentials, voltage clamp (truck unloading)	Chapters 2, 3	**Lab:** Lab notebooks/ Pipette class PCR Intro/ lecture and set-up Computer simulation	Optional review
Wednesday July 19	Ion channels,	Text: Chapter 4 Handouts: Simulation,	**Lecture:** Ion channels cont. **Lab:** PCR data analysis Immunocytochemistry (IHC)	Optional review
Thursday July 20	Synapses: electrical and chemical, neuromuscular junction	Text: Chapters 4, 5	Simulation exercises IHC part 2 IHC lecture	Simulation cont
Friday July 21	Neurotransmitters and neurotransmitter receptors.	Chapter 6	**LN check** Intro to iWorx Lab methods lecture	Simulation cont
Saturday July 22	Intracellular signal transduction pathways and cascades (end material for Quiz 1)	Chapter 7 Handouts	Equipment hook-up and familiarization; safety Human EMG demo	
Sunday July 23	*Study day*			Review Session
Monday July 24	**Quiz 1**		*Limulus* nerve prep. Fluorescence Imaging	Fluorescence Imaging
Tuesday July 25	**Simulation exercises due 8:00am** Sensory transduction	Selected portions of Chapters 9, 11,13, 15 Handouts	Crayfish stretch receptor. Fluorescence Imaging	Fluorescence Imaging
Wednesday July 26	Muscle contraction, motor unit recruitment/ Sensory-motor integration & reflexes	Handouts Chapter 16	*Limulus* nerve-muscle prep. Fluorescence Imaging	Fluorescence Imaging

Thursday July 27	Vestibulo-ocular reflexes Ethics *Intro to independent projects*	Handouts Chapter 14	*Limulus* lateral eye experiments Fluorescence Imaging – small groups	Whole cell patch clamp recording – **group demo**
Friday July 28	Passive membrane properties/Synaptic integration		Two electrode voltage clamp-– **group demo** patch clamp recording **–** small groups **LN check**	voltage clamp**–** small groups patch clamp recording**, –** small groups
Saturday July 29	Transporters **Independent project plans due.**		Voltage clamp**–** small groups Patch clamp recording,– small groups	**Draft of lab report 1 due at 5:00 pm.**
Sunday July 30	*Study day*			
Monday July 31	Pharmacology		Whole cell patch clamp recording, – small groups independent projects	Review Session
Tuesday August 1	**Quiz 2**		**Lab report 1 due 5:00 pm** Complete independent projects **LN check**	
Wednesday August 2	Boat ride		Dismantle rigs, pack truck	**End of class party**
Thursday August 3	Finish lab report 2 Departure		**Lab report 2 due 5pm**	

LN check – lab notebook check

Grade breakdown:

Quiz 1	50
Quiz 2	50
Lab rpt 1	15
Lab rpt 2	15
Simulation	15
Lab notebook	5