SDSL Systems Neuroscience

Professor:
Marty Sereno -- email: msereno@sdsu.edu
class time (2017): MWF 9:00-9:50 AM (grad: F 8:00-8:50 AM)
location1: 1st class, exams only: LSS 356
location2: exams: SSW 2650
location3: lectures: SSW 2667
expect to take copious notes
exam mostly based on lecture content

Readings:
readings, lecture videos (links, top of homepage)
background reading (neuroscience reference texts):
background reading (undergrad neuroscience textbooks):

Exams:
multiple question short-answer, each question with a few
subsections, examples given in lecture
undergraduate: 2 midterms, final -- short-answer (midterms: 30% each, final: 40%)
graduate: 2 midterms, final (midterms: 24% each, final: 32%)
and short final paper (20%)
old pdf answer keys from my similar UCSD Systems Neuroscience course (2007) here and here

Learning Objectives:
Students will be able to do the following:
(1) describe and explain neuronal chemistry, electronics, development, and evolution
(2) describe and diagram neuroanatomical structures and their connections in visual, somatosensory, auditory, motor, limbic systems
(3) describe and analyze sequential processing stages in visual, somatosensory, auditory, motor, limbic systems from a signals and systems perspective
N.B.: consult with me if a disability hinders your performance so we can use University resources to maximize learning

Lecture Topics: (Spring 2017)
Week of Jan 16 (WF) -- Introduction
introduction to course
membrane (Nernst) potential
Week of Jan 23 (MWF) -- Cellular Physiology
action potential, voltage-gated channels
post-synaptic potentials, ligand-gated channels
dendritic propagation, equivalent circuits
Week of Jan 30 (MWF) -- Relation to Neural Models
NMDA channels, synaptic plasticity
spike-timing-dependent plasticity
[no class: Wed Feb 01]
relation to simple Hebbian and attractor network models
Week of Feb 06 (MWF) -- Neural Development
gastrulation, neural plate, neural tube, optic cup
cylindrical coordinate system, temporal lobe formation
the 'rule of Sereno'
Week of Feb 13 (MWF) -- Visual System I
cylindrical coordinate system, temporal lobe formation
visual system I

dLGN (layers, non-lagged/lagged)