

DEPARTMENT OF PHYSICS

Fall 2007

Physics 171/271

Sept. 21, 2007

Web page: <http://physics.ucsd.edu/students/courses/fall2007/physics171/>

**INSTRUCTOR:** Professor Herbert Levine (hlevine@ucsd.edu)  
Office: 7230 Urey Hall; 534-4844  
Office Hours: Monday 11 am-1 pm or by appointment  
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**COURSE COORDINATOR:** Patti Hey, 118 Urey Hall Addition, 822-1468, [plhey@physics.ucsd.edu](mailto:plhey@physics.ucsd.edu)

**TEACHING ASSISTANT:** Scott Stambach, [sstambac@physics.ucsd.edu](mailto:sstambac@physics.ucsd.edu)  
Office Hour: TBA

**CLASS SCHEDULE:**

*Lectures:* TTh 8:00 – 9:20 AM, WLH 2208

*Final Exam:* due on Friday, Dec. 13

**TEXT:** Johnston/Wu Foundations of Cellular Neurophysiology

**COURSE FORMAT:** Physics 171/271 is a course covering the biophysical basis for neural information processing. It starts from the basic physics of ion behavior in neural cells and discusses action potentials, synaptic transmission, and the beginnings of information processing in neuronal populations.

**HOMEWORK ASSIGNMENTS:** Problem sets are assigned as selections from each text chapter, plus possibly several additional problems. Some extra problems involving simple numerical exercises will be assigned to 271 students. Solutions will be available either in the text itself or on the course web site. The homework will be partially graded, and will count for roughly 25% of the course grade.

**EXAMS:** There will be one midterm and one final exam.

**APPROXIMATE SCHEDULE**

Week	Date	Topic	Chapter
1,2	9/27-10/4	Ionic motion, membrane conductances	2,3,5
3	10/9-10/11	passive cable theory, dendrites	4
4,5	10/16-10/25	action potentials, channels, simplified models	6,7 +handout
<b>MIDTERM EXAM 10/29</b>			
6,7	11/1-11/8	microscopic models of channels	8,9
8	11/13-11/15	synaptic dynamics; plasticity, Hebb rule	11-13; 15
9,10	11/20-11/29	spike encoding of information	handout
11	12/4-12/6	simple neural networks	handout

**FINAL EXAM (take-home) due on Fri. 12/13**