

Draft Syllabus Neurobiology, BioU405

Fall 2006 - Room: TBA Time: TBA

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Text: Neurobiology – Molecules, Cells and Systems, G. Matthews, 2nd Edition

Old Lecture Schedule (from Fall 2004): Topics and Assignments subject to Change

<u>Week</u>	<u>Day - Date</u>	<u>Lecture Topic:</u>	<u>Assigned Reading</u>
1	Wed 9/8 Fri 9/10	Introduction to Neuroscience Evolution of Nervous Systems	Chap. 1 Chap. 2
2	Tue 9/14 Wed 9/15 Fri 9/17	Imaging Nerve Cells (see BB/blackboard notes) Membrane Potential - cell volume and osmosis Membrane Potential - equilibriums & currents	Suppl. Mat'l. Chap. 3 Chap. 3
3	Tue 9/21 Wed 9/22 Fri 9/24	Action Potential – ionic conductances Action Potential – propagation, molecular properties Synaptic Transmission @ NmJx - Acetylcholine Release	Chap. 4 Chap. 4 Chap. 5
4	Tue 9/28 Wed 9/29 Fri 10/1	Synaptic Transmission @ NmJx – Postsynaptic Mechs. CNS Synaptic Transmission – Excitation & Inhibition EXAM I (covers through Chapter 5)	Chap. 5 Chap. 6
5	Tue 10/5 Wed 10/6 Fri 10/8	CNS Synaptic Transmission – channels, modul., integration Hypothalamus Overview of Sensory Systems	Chap. 6 Chap. 12 Chap. 13
6	Tue 10/12 Wed 10/13 Fri 10/15	Somatosensory System – receptors & spinal cord Somatosensory System - relays, thalamus & cortex Visual System – Retina: phototransduction	Chap. 14 Chap. 14 Chap. 15
7	Tue 10/19 Wed 10/20 Fri 10/22	Visual System – Retina: visual signal processing Visual System – LGN Visual Cortex -- Prof. Eskew- guest lecturer (SFN)	Chap. 15 Chap. 16 Chap. 16
8	Tue 10/26 Wed 10/27 Fri 10/29	Pain Pathways -- Prof. Sikes- guest lecturer (SFN) Circadian Rhythms – Prof. Davis – guest lecture (SFN) EXAM II (covers Chapters. 6,12,13,14 and 15)	Chap. 14 Chap. 12
9	Tue 11/2 Wed 11/3 Fri 11/5	Motor Control – excitation-contraction coupling Motor Control – motor units & recruitment Spinal Cord – reflexes	Chap. 7 Chap. 7 Chap. 8
10	Tue 11/9 Wed 11/10 Fri 11/12	Spinal Cord – CPGs and locomotion Motor Control – brainstem and cortex Motor Control – basal ganglia and cerebellum	Chap. 8 Chap. 9 Chap. 9
11	Tue 11/16 Wed 11/17 Fri 11/19	Eye Movement Control – Saccades Autonomic Nervous System EXAM III (covers Chapters 16, 7, 8, 9 and 10)	Chap. 10 Chap. 11
12	Tue 11/23 Wed 11/24 Fri 11/26	Auditory System – mechanotransduction no class - Thanksgiving no class – Thanksgiving	Chap. 17

*last day to drop cleanly: **xxxx** last day to drop with W: **xxxx***

13	Tue 11/30	Auditory System – auditory signal processing	Chap. 17
	Wed 12/1	Chemical Senses	Chap. 18
	Fri 12/3	Neural Development	Chap. 19
14	Tue 12/7	Synaptic Plasticity – LTP & circuits	Chap. 20
	Wed 12/8	Machine, Learning AI and Theoretical Neurosci.	Suppl. Mat'l.

15 **Final Exam – TBA Important:** Final Exam *cannot* be given early.
(Final Exam will be Cumulative, but with more emphasis on new material)

1. Exams and Grading:

Exams are multiple choice and matching

Research Report – 10%
Exam I - 20%
Exam II - 20%
Exam III - 20%
Final Exam - 30%
Total - 100%

Academic Integrity: Cheating of any kind is unacceptable and will result in a grade of F for the course and a report being sent to the college Dean.

Exam Content: Exam questions will test your understanding of the assigned reading in *Matthews*, but will be heavily weighted towards overlapping material from lecture. Read each assigned book chapter in its entirety. Some exam questions will address material presented in lecture that is not in the text book.

Curvature: My exams are designed to *very thoroughly* test your knowledge and averages usually run in the 60's. But there is also considerable curving of the grades. For “curved” grades the usual grading scheme applies:

A: 100-90, B: 89-80, C: 79-70, D: 69-60, F: below 60. (with +/- grading).

Bonus Points/Pop Quizzes: Up to **10 bonus points** towards the *final exam* grade can be earned based on pop-quizzes. Five pop-quizzes, worth 2.0 points each, will be given in class, for a total 10 possible bonus points. Bonus points *will not* affect the grade distribution of the final exam, so they can only improve your grade. There will be no make up for missed pop quizzes. Pop quizzes will start promptly at 3:25 p.m., will take 10 minutes or less, and will cover material from the last few lectures/readings. Because *very substantial* partial credit will be given, pop quizzes offer an excellent opportunity to boost your final exam grade: simply come to class on time, attend regularly, keep up with the text reading and periodically review your lecture notes, and you should be able

to greatly boost your final exam grade, which is worth 30% of the overall course grade.

Missed Exams: There will be **No Make-Up Exams**. A grade of zero will be given *except* in a case of a **documented emergency**. In such a case a substantial research paper will be assigned and graded based on scientific content, critical analysis and excellence of written presentation.

2. Office Hours: 422 Richards Hall, Office of Don O'Malley, 373-2284, d.omalley@neu.edu
Tuesday: 10:00 - 12:00 **Thursday:** 10:00 – 12:00
If you stop by at other times, and I am available, I will be happy to help you.

3. Research Report: Each person will select an original research article (that relates to a topic from class) and write a summary and critique that conveys the paper's contribution to the research literature. I will provide quite detailed guidelines explaining how to do this and will help you with any aspects of the article that pose difficulties. You will be able to select the articles (in consultation with me) from one of the 3 top-tier neuroscience research journals and I will provide a PDF for your use. I will provide detailed guidelines within the next 2 weeks.

4. Additional Help & Resources: Tutors might be available through the Academic Assistance Center (102 Cahners, 373-2328) and through the Media Center (200 Snell Library, 373-2465). In addition, I have a number of supplementary texts and reading materials. Please see me if you would like to try out some of these materials. Most importantly, **Seek Help Early**. If one waits until the day before the second exam to address substantial difficulties, then there will not be enough time to take meaningful corrective actions. *Good Luck!!*