NEUROSCIENCE M101A: FALL, 2008
(MCD Biology M175A, Physiological Science M180A, Psychology M117A)

Neuroscience: From Molecules to Mind: Cellular Neurophysiology, Sensory and Motor Systems

Instructors:
S. H. Chandler, Physiological Science 2859 Slichter Hall x66636
(Course Coordinator) Office hours: Wed, Thurs 4:00-5:00 p.m.
Nakit Piri, Ophthalmology B224 Jules Stein Eye Institute, x59850
Office hours: Tues 4:00-6:00 p.m. or by appt
S. White, Physiological Science LSB 2353 x41888
Office hours: Thurs 4:00-5:00 p.m. and an additional OH TBA, or by appt.

Web Page and Bulletin Board:
The web page for the Neuroscience program is http://www.neurosci.ucla.edu and should be consulted for general information regarding the major. The web page for the course can be found at www.lsic.ucla.edu/classes/fall08/ which contains a bulletin board as well. The bulletin board is linked to the web page. You are encouraged to use the bulletin board to ask questions and to read the questions and answers posted by fellow students, instructors and TA's. All questions pertaining to course material should be placed on the bulletin board and not sent to individual instructors so that all students can have the benefit in seeing the answers. If you feel unfamiliar with computer resources, please contact the course coordinator and tutorial sessions will be arranged.

Teaching Assistants
Pamela Douglas Office Hours: TBA
Carlos Lazo Office Hours: TBA
Gretchen Miller Office Hours: TBA
Melissa Moore Office Hours: TBA

Lectures:
Tues/Thurs 2:00-3:50 p.m., Young CS 24

Discussion Sections:
Section 1A: Friday 8-9:20AM Geology 4645
Section 1B: Friday 9:30-10:50AM Geology 4645
Section 1C: Friday 11-12:20PM Geology 4645
Section 1D: Friday 12:30-1:50PM Geology 4645
Section 1E: Friday 8-9:20AM Geology 6704
Section 1F: Friday 9:30-10:50AM Geology 6704
Section 1G: Friday 11-12:20PM Geology 6704
Section 1H: Friday 12:30-1:50PM Geology 6704

If you have any questions about registration for discussion sections please contact Melissa Moran (x62349, mmoran@mednet.ucla.edu, 1506D Gonda (Goldschmied) Neuroscience and Genetics Research Center).

You must attend your assigned discussion section. There are NO exceptions.
Graded Quizzes and Discussion Section Assignments

Discussion sections will have a combination of problem sets, and journal article readings. Depending which instructor is teaching, there could be quizzes and/or written assignments. This will be explained in discussion section by your TAs and announced in class. For instance, for Module 1 there will be a short 10 minute quiz at the beginning of each discussion section, excluding week 1 (Oct. 3, Oct. 10, Oct. 17). So be prepared! There are absolutely NO make-up quizzes and when applicable, the written assignments must be typed and no longer than one page (TAs will not read beyond the first page). These assignments are graded and worth up to 10 points each. Each written assignment has to be turned in at the beginning of the Discussion Section in which the paper was assigned. Papers turned in late will NOT be graded and there will be no make up papers. There are absolutely no exceptions. Additionally, you will be required to submit your papers via “Turn It In” which can be found at My UCLA. Students must work independently on these papers. Plagiarism is considered cheating and students will be sent to the Dean of Students.

There is a maximum of 90 points for Discussion Sections. Your lowest score will be dropped, thus making the total points for Discussion Sections = 80.

Seminar Attendance

You are required to attend one Neuroscience seminar during the quarter and write a summary of the seminar. A list of upcoming Neuroscience seminars is available on the Neuroscience Major Home Page (http://www.neurosci.ucla.edu/seminars.asp) and also will be placed on the course web page. Summaries should be typed, single-spaced; no more than one paragraph, and should convince the TA that you did attend the seminar. If the TA is unconvinced, you will have to attend another seminar. The seminar is worth 5 points. You may attend any seminar during the quarter but the summary is due within one week of your attendance at that seminar. Please include the date, time, place, name of the speaker and the title of the seminar on your summary. The last day to turn in any seminar summary is Thursday, December 4.

Clinical Correlations

You are required to attend both special Clinical Correlation Lectures. Each lecture provides a clinical correlation to material presented in class. The first lecture (Nov. 13) will be on Epilepsy and will be given by Gary Mathern, M.D. The second lecture (Dec. 2) will be on the Neurological Examination and will be given by Thomas Carmichael, M.D. Clinical Correlation Lectures will be held in CHS 73-105. Attendance will be taken at each lecture. You are required to write a 1/2 page (maximum) summary of the lecture material, single-spaced (typed). These are due one week after the lecture. You will receive 5 points for each Clinical Correlation Lecture attended.

Required Texts and Readers


Chandler, Piri and White. Lecture Notes and Readings for Discussion, 2007. Available from Course Reader Material, 1141 Westwood Blvd. (Bring to each Lecture and Discussion Section). Each module will have a separate reader which you can obtain prior to the start of that module. All 3 instructors will have their readers available as a PDF that you can download from our web page. You should print it out immediately and bring pertinent sections to class. Alternatively, you can purchase a bound copy from Course Reader Material at the appropriate time.

Honors Contracts: Contact Dr. Chandler in week #2.

Grading

There are 2 hour, 100 point EXAMS following each module. Note that Exams 1 and 2 occur after the end of Modules 1 and 2, and Exam 3 is scheduled during Finals Week. No early or late exams will be permitted. If you are unable to take an exam because of illness or emergency contact Dr. Chandler or the Neuroscience Office before the exam.
Exam 1: 100 points. Module 1: Cellular Neurophysiology. Monday, October 20
Exam 1 will start at 7 pm and end at 9 pm. Room LaKretz 110. (Arrive 10 minutes early, alternate seats)

Exam 2: 100 points. Module 2: Motor Systems. Monday, November 10
Exam 2 will start at 7 pm and end at 9 pm. Room LaKretz 110. (Arrive 10 minutes early, alternate seats)

Exam 3: 100 points. Module 3: Sensory Systems. Monday, December 8, 3-6 p.m., Room TBA.

All exams are closed book. Calculators or talking during the exam are not allowed. Any violation of this policy will result in the student being sent to the Dean of Students Office.

CLASS GRADES are loosely based on a 70% = C, 80% = B, 90% = A sliding scale. Use this to get an approximation as to how you are doing in the class.

<table>
<thead>
<tr>
<th>Class Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>Three Module Exams</td>
<td>300</td>
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<tr>
<td>Discussion Sections</td>
<td>80</td>
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<tr>
<td>(90 points, but lowest score dropped)</td>
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<tr>
<td>Seminar Attendance</td>
<td>5</td>
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<tr>
<td>Clinical Correlation</td>
<td>10</td>
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<td>Total =</td>
<td>395</td>
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TOPICS AND ASSIGNED READINGS FOR LECTURES AND DISCUSSIONS

Note that in addition to book chapters, students are responsible for contents of the course readers.

**Date** | **Lecturer** | **Lecture Title, Readings for Lecture or Discussion**
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Th, Sept. 25 | Chandler | Introduction, electricity and ion channels. Read Bear (pp. 23-45, 51-72) and Matthews (pp. 3-16).
F, Sept. 26 | Discussion | Introduction and review of electricity.
Tu, Sept. 30 | Chandler | Ion channels and origin of resting potential. Read Matthews (pp. 26-32; 40-54).
Th, Oct. 2 | Chandler | Intraneuronal communication: Passive membrane properties.
F, Oct. 3 | Discussion | Equilibrium potentials. **Bring calculator to section.**
Tu, Oct. 7 | Chandler | Intraneuronal communication: Action potentials and voltage-gated channels. Read Bear (pp. 75-99) and Matthews (pp. 55-94).
Th, Oct. 9 | Chandler | Intraneuronal communication: Action potentials and voltage-gated channels, continued.
F, Oct. 10 | Discussion | Charge separation calculation and review. **Bring calculator to section.**
Tu, Oct. 14 | Chandler | Interneuronal communication: Mechanisms for synaptic transmission. Read Bear (pp. 101-131) and Matthews (pp. 110-148).
Th, Oct. 16 | Chandler | Interneuronal communication: Synaptic integration.

**MON, Oct. 20** | **Exam 1** | Cellular Neurophysiology. Evening Exam 7:00-9:00 p.m. LaKretz 110

**Module 2: Motor Systems**

Tu, Oct. 21 | White | Introduction to motor systems
Th, Oct. 23 | White | Spinal control of movement. Read Bear Ch. 13
Fri, Oct. 24 | Discussion | Julia Understands Everything (Newspaper article, quiz).

Th, Oct. 30  White  Finish brain control.

Tu, Nov. 4  White  Modulation of movement by the basal ganglia. Read Bear pp 464-468.

Th, Nov. 6  White  Modulation of movement by the cerebellum. Read Bear pp. 474-478.


**MON, Nov. 10**  **Exam 2**  Motor systems. Evening Exam 7:00-9:00 p.m. La Kretz 110

**Module 3: Sensory Systems**

Tu, Nov. 11  **VETERANS DAY, no class**

Th, Nov. 13  **Piri**  Overview of sensory systems. Audition. Bear Ch. 11.

**Th. Nov. 13**  **Mathern**  Clinical correlation #1 Epilepsy. 4pm CHS 73-105. Be on time.


Tu, Nov. 18  **Piri**  Chemical senses: taste and olfaction. Bear Ch. 8.

Th, Nov. 20  **Piri**  Somatic sensory system: Touch and Pain. Bear Ch. 12.


Tu, Nov. 25  **Piri**  Vision 1: Anatomy of the eye and phototransduction. Bear Ch. 9.

**Th, Nov. 27**  **F, Nov. 28**  THANKSGIVING, HAPPY HOLIDAY. THANKSGIVING, HAPPY HOLIDAY

Tu, Dec. 2  **Piri**  Vision 2: Organization of the visual pathways. Bear Ch. 10, pp 310-333.

**Tu. Dec. 2**  **Carmichael**  T. Carmichael Clinical Correlation Lecture: Neurological Exam. (4-5pm, CHS 73-105)


**Mon, Dec. 8**  **EXAM 3**  **FINAL EXAM**, 3-6pm room, TBA