INTRODUCTORY NEUROSCIENCE: THE ART AND SCIENCE OF STUDYING THE BRAIN.
NS 20 (4 UNITS) [FALL 2020]

Course Instructor:
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Course Description:
Lecture, four hours per week; discussion, 90 minutes/week. Preparation: high school background in either biology or chemistry. Limited to neuroscience majors. General overview of the field of neuroscience to serve as an introduction to the Major. Topics covered include a brief history of the field, basic neurophysiology and neuroanatomy, research methods, experimental design, data analysis and career prospects. May not be applied toward elective requirements for major. Letter grading.

Course Format:
This general and introductory course is designed to provide novice undergraduate students with a broad overview of what the neuroscience major entails at UCLA. Although students might be able to loosely define the term “neuroscience”, it is probably equally true that they do not fully grasp what becoming a neuroscientist requires. For instance, what do we know about the brain so far that needs to be learned? How does a neuroscientist discover new things? What does a career in neuroscience look like? Knowing the answers to these (and other) questions will not only help students assess the value of a neuroscience degree, but also mentally prepare them to succeed in this major. This course will only scratch the surface of a variety of topics, but it will provide students with a solid overview of the field from a historical, anatomical, physiological, experimental and logistical perspectives. A combination of interactive
lectures, discussions, readings and exercises will be used to give students the knowledge base needed to better understand their major.

**Student Learning Outcomes:**
1) Gain a holistic view of the field of neuroscience.
2) Appreciate how new knowledge is experimentally acquired and analyzed.
3) Acquire enough insight into the Neuroscience Major at UCLA to anticipate the challenges ahead and successfully overcome them.

**Class Time and Location:**

Lecture: Monday & Wednesday, 10:00 - 11:50 AM  
Online- recorded

Discussion: Thursday, 10:30 - 11:45 AM  
Online

**Reading Materials (Provided in Class):**


Assignments and Grading:
The grading scheme is basic, using a standard scale (A= 93-100%, A-= 90-92.9%, B+= 87-89.9%, B= 83-86.9%, B-= 80-82.9%, C+= 77-79.9%, C= 73-76.9%, C-= 70-72.9%, etc...) and without the use of curves to eliminate one source of course anxiety. The final grade will be calculated by adding all your earned points and dividing them over the total possible points in the course. More specifically, points will be assigned as follows:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
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<tbody>
<tr>
<td>Biographical assignment</td>
<td>– 130 pts</td>
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<tr>
<td>Midterm evaluation</td>
<td>– 165 pts</td>
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<tr>
<td>Problem sets (3)</td>
<td>– 180 pts</td>
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<tr>
<td>Section, attendance and activities</td>
<td>– 100 pts</td>
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<tr>
<td>End of course self-assessment</td>
<td>– 50 pts</td>
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<tr>
<td>Participation</td>
<td>– 75 pts</td>
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<td>Total</td>
<td>– 700 pts</td>
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Online Tools:
Within the course website (https://ccle.ucla.edu/course/view/20F-NEUROSC20-1) is the discussion forum. Students are encouraged to post general questions here. Not only will the course TA’s and instructor regularly post answers, but you will also get the insight from your fellow classmates. Certain course materials, like pdf’s of primary literature articles will be made available on the course website as well.

Course Evaluations:
Like all courses at UCLA, you will be asked to evaluate the instructor and course in the last few weeks of the quarter. These evaluations are conducted electronically and you are strongly encouraged to complete them as they are used to help improve the course in the future. Your thoughts and ratings are taken seriously and are used to improve the course is subsequent years. You will be getting several e-mail reminders for these evaluations later in the quarter.

Academic Integrity
UCLA is a community of scholars, which is to say a group of like-minded individuals in search of new knowledge. The process of discovery and dissemination of knowledge only works when everyone agrees that cheating and copying ideas is actually counterproductive to the search for new truths. In this community, all members, including faculty, staff and students are responsible for maintaining high standards of academic honesty and to actively avoid any type of cheating. Specifically, you, as a student, are here to get an education, which necessarily means stumbling and making mistakes from time to time. Attempting to cheat in order to overcome these normal and expected mistakes will not only detract from your educational experience, but also initiate a disciplinary process that could jeopardize your tenure at UCLA. Protocol dictates that any type of cheating will be reported to the Dean of Students, who will be encouraged to take strong action. Past examples of penalties include loss of an entire quarter of credit
and suspension for several quarters. If you plan to apply to graduate or professional school, such a blemish on your record may be a major obstacle to admission.

If you are unclear of the rules and policies on academic integrity, feel free to review them at: http://www.deanofstudents.ucla.edu/students/integrity/. You are also reminded to review the student conduct code, section 102.01a-g in case you are unclear what types of behaviors are considered academic misconduct at UCLA (things like cheating, fabrication, plagiarism, multiple submissions, grade coercion or unauthorized collaboration). You can access the student conduct code at: http://www.deanofstudents.ucla.edu/Student-Conduct-Code

Center for Accessible Education:
Students needing academic accommodations based on a disability must contact the Center for Accessible Education (CAE) at (310) 825-1501 or present in person at Murphy Hall A255. As the professionals delegated authority from the campus to determine reasonable disability accommodations, CAE will assess all requested accommodations and communicate appropriately with faculty. In the event that a student has approval for proctoring arrangements during exams, please inform your respective professors and/or Teaching Assistant(s) before date of exam(s). When possible, students should contact the CAE within the first two weeks of the term as reasonable notice is needed to coordinate accommodations. For more information visit www.cae.ucla.edu.

Additional Campus Resources:

Letters & Science Counseling Service
A316 Murphy Hall: (310) 825-1965
www.college.ucla.edu

Academics in the Commons
at Covel Commons: (310) 825-9315
Free workshops on a wide variety of issues relating to academic & personal success
www.orl.ucla.edu (click on "academics")

College Tutorials
at Covel Commons: (310) 825-9315
free tutoring for ESL/math & science/composition/and more!
www.college.ucla.edu/up/ct/

Student Psychological Services
John Wooden Center West
221 Westwood Plaza (310) 825-0768
http://www.counseling.ucla.edu/

Lesbian, Gay, Bisexual and Transgender Resource Center
220 Westwood Plaza B36, Student Activities Center
(310) 206-3628
www.lgbt.ucla.edu

Dashew Center for International Students and Scholars
106 Bradley Hall: (310) 825-1681
www.intl.ucla.edu
http://www.internationalcenter.ucla.edu/

Student Legal Services
70 Dodd Hall: (310) 825-9894
www.studentlegal.ucla.edu
Discussion Section:
Weekly discussion sessions are intended to deepen your understanding of the material covered in class. Your attendance and participation is mandatory as it will provide a substantive percentage of your course grade. There will be 10 meetings where the following topics will be covered:

Week 1- (Oct 8): Meet your TA- Introductions and expectations.
Week 2- (Oct 15): History- ancient times to 20th century.
Week 3- (Oct 22): Building circuits- Neuronify.
Week 4- (Oct 29): Statistics in research.
    Discuss “How to Read a Scientific Paper” (2013, ASPB) [pgs. 7 – 12].
Week 5- (Nov 5): Literature searches- PubMed and journal websites.
Week 6- (Nov 12): Working in a lab- What to expect & how to find and approach one.
Week 7- (Nov 19): Research deconstruction- Discussion of paper #1.
Week 8- (Nov 26): Thanksgiving Holiday
Week 9- (Dec 3): Research deconstruction- Discussion of paper #2.
Week 10- (Dec 10): Research deconstruction- Discussion of paper #3.

CLASS SCHEDULE

Week 1

Wednesday, Oct. 7  Modern history. A field matures: the last 100 years.

Week 2

Wednesday, Oct. 14  Neurophysiology, part I. Resting membrane potential, the action potential and propagation.

Week 3
Monday, Oct. 19  Neurophysiology, part II. The synapse and synaptic plasticity.


Biographical Assignment Due
Week 4

Wednesday, Oct. 28  Experimental Design. The scientific method. Importance of controls. Data sampling and rationale behind statistical analyses.

Week 5
Take Home Midterm Exam Due (Dev., Physiol., Anat., Cell Bio.)

Wednesday, Nov. 4  Model Systems, part II. Vertebrates: zebrafish (D. rerio), zebrafinch (T. guttata), mouse (M. musculus), Rhesus monkey (M. mulatta). Ethical considerations. ARC and IRB approvals.

Week 6
Monday, Nov. 9  Scientific Communication. Verbal and written expression. Reading a primary research article.

Wednesday, Nov. 11  Veteran's Day Holiday

Week 7
Monday, Nov. 16  Research in Neuroscience, example 1, deconstruction #1.

Wednesday, Nov. 18  Research in Neuroscience, example 1, deconstruction #2.

Week 8
Monday, Nov. 23  Research in Neuroscience, example 2, deconstruction #1.
Deconstruction Problem Set #1 Due

Wednesday, Nov. 25  Research in Neuroscience, example 2, deconstruction #2.

Week 9
Monday, Nov. 30  Research in Neuroscience, example 3, deconstruction #1.
Deconstruction Problem Set #2 Due

Wednesday, Dec. 2  Research in Neuroscience, example 3, deconstruction #2.
**Week 10**
Monday, Dec. 7  
Deconstruction Problem Set #3 Due

Wednesday, Dec. 9  
Next steps- Career options. Professional or graduate schools. Types of terminal degrees. Professional memberships.

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**Week 11 (Finals)**
Monday, Dec. 14  
Self-Assessment Due.

Wednesday, Dec. 16

~End of Syllabus~