Neuroscience I

BIOS/PHIL/PSCH 484
MWF 1:00-1:50
Lecture Center F6

Fall 2016
3 credit hours

INSTRUCTOR INFORMATION

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Office Hours</th>
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<tbody>
<tr>
<td>Dr. John Leonard</td>
<td><a href="mailto:leonard@uic.edu">leonard@uic.edu</a></td>
<td>by appointment</td>
</tr>
<tr>
<td>(course coordinator)</td>
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<tr>
<td>Dr. Dave Wirtshafter</td>
<td><a href="mailto:davew@uic.edu">davew@uic.edu</a></td>
<td>by appointment</td>
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<tr>
<td>Dr. Janet Richmond</td>
<td><a href="mailto:jer@uic.edu">jer@uic.edu</a></td>
<td>by appointment</td>
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<tr>
<td>Laura Manning (TA)</td>
<td><a href="mailto:manning5@uic.edu">manning5@uic.edu</a></td>
<td>will poll students for best times,</td>
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<td>see Blackboard for updates</td>
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OFFICE HOURS

COURSE WEBPAGE: The UIC Blackboard website (blackboard.uic.edu) will contain all course material including lecture material, assignments, readings, and announcements. This site will be updated regularly. Please check here for information before e-mailing your instructors with general questions.

PREREQUISITES: BIOS 286 or PSCH 262 are required prerequisites for this course. It is also highly recommended by former students (though not required) to take Cell Biology and Genetics before taking this course.


Note that this is a suggested text. Unless specifically noted, material that is not discussed in class will not be tested. The textbook is best used as a reference for figures and clarification of concepts. Students should focus on lecture notes and are not required to read the book.

See Blackboard for additional posted materials.
I-CLICKERS: Will be used for some, not all, lectures. Students may reuse an old I-Clicker or purchase one at the UIC Bookstore, or see an instructor. Information about I-Clicker registration can be found on the course Blackboard page.

LECTURE CAPTURE: Will be available for certain lectures but is not guaranteed. Students are welcome and encouraged to use a recording device or cell phone to record the lectures they attend.

DISCLAIMER: The terms of this syllabus are subject to change by announcements in class, on Blackboard, or by email.

COURSE DESCRIPTION
Neuroscience I is an introduction to neuroscience as an integrative discipline. Students will develop a foundation of knowledge in a range of neuroscience topics, including an understanding of current methods and recent findings in the field. Topics covered include neural development and neuroanatomy of vertebrates, cellular neurobiology, action potential mechanisms, synaptic transmission, and neuropharmacology. We also aim to foster intellectual leadership, critical thinking skills, and communication skills in order to prepare our students for careers in science and engineering.

ATTENDANCE
Attendance is expected at all scheduled lectures and exams. Religious obligations, official University activities, or extreme cases of illness may qualify a student for a conflict exam. Except in the case of emergency, students must notify the professors or TA no later than 1 week prior to the scheduled exam and provide appropriate documentation of the conflict, to be taken within 1 week of the scheduled exam.

Please see UIC’s official policy for rescheduling final exams at https://registrar.uic.edu/current_students/calendars/final_exam_schedule.html

Instructors reserve the right to accept or reject late work.

Unless otherwise stated, exam material will be covered during lecture, so attendance is essential in this course. We highly recommend that students bring a printed copy of the lecture notes that can be annotated during class. The textbook is useful as a reference for topics discussed in lecture. It is also helpful to read the relevant sections of the text before class.
EXAMS
There will be three exams in this course: two in-class midterm exams and one final exam. Exams have historically consisted of 40-60 multiple choice, short answer, and true/false questions, but the instructors reserve the right to change this format. Each exam will be based on material discussed in class and include only material presented before that exam. Plagiarism and cheating are not tolerated and may result in dismissal from the university.

PARTICIPATION/ASSIGNMENTS
A variety of activities will be assigned to help students practice their understanding of the material. These include participation in class group activities, homework problem sets, and in-class quizzes. These assignments are worth 2 points – 1 point for a decent effort completed on time, 1 point for a high quality effort. The instructors will create these assignments as needed, but students can earn full participation points by earning 12 points (6 assignments at 2 points each). For example, last year, there were 8 assignments.

GRADING
Midterm 1 28% A 90-100
Midterm 2 28% B 80-89
Participation/4% C 70-79
Assignments D 60-69
Final exam 40% F 0-59

Final grades are usually scaled in this class. The scale will not be determined until after all exams and assignments have been graded and will depend on class performance. A standard grade breakdown is described above. The scale will never raise the cutoffs for these grades, but it is not guaranteed to lower them.

Students need to properly register for a class in order to earn academic credit. Retroactive enrollments will not be processed.

Students are able to drop a course without penalty through Friday of the ninth week of the semester. Late drops are subject to the College of LAS rules and students should consult with the College advisor (996-3366).
COURSE OUTLINE
The syllabus outlines the topics to be discussed; each presenter will suggest page numbers in the suggested textbook that can be referred to when appropriate.

COURSE SYLLABUS: SUBJECT/ INSTRUCTOR / Week of ---Topics TEXTBOOK PAGES

<table>
<thead>
<tr>
<th>Week</th>
<th>Subject</th>
<th>Instructors</th>
<th>Topics</th>
<th>Textbook Pages</th>
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<tbody>
<tr>
<td>Aug 22</td>
<td>Overview:</td>
<td>John Leonard</td>
<td>Introduction to Neural Systems</td>
<td>Chapter 1;</td>
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<td>Aug 29</td>
<td>Cellular</td>
<td>John Leonard</td>
<td>Neurobiology</td>
<td>Ch. 2: 21-31</td>
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<td>Sept 05</td>
<td>LABOR DAY</td>
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<td>Chapter 4</td>
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<td>Sep 07-09</td>
<td>SubCellular</td>
<td>John Leonard</td>
<td>Osmotic Balance and Maintenance of Cell Volume</td>
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<td>Sep 12</td>
<td>Ion Channels</td>
<td>John Leonard</td>
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<td>Chapter 5</td>
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<td>Sep 19</td>
<td>Resting Potential</td>
<td>John Leonard</td>
<td>The Voltage-Clamp Device Squid Giant Axon Ionic</td>
<td>Chapter 6</td>
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<td>Currents across Voltage-clamped Membranes</td>
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<td>Sep 26</td>
<td>Action Potentials</td>
<td>John Leonard</td>
<td>Kinetics of Change in Ionic Conductance Initiation</td>
<td>Chapter 7</td>
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<td>of Action Potentials Propagation The Gated Ion Channel</td>
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<td>Model Molecular Properties of the Voltage-sensitive Na</td>
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<td>; K Channels</td>
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<td>Oct 03</td>
<td>Electrical Vs Chemical Synapses</td>
<td>Janet Richmond</td>
<td>Synaptic Transmission-presynaptic release The quantal nature and calcium-dependence of release Molecular mechanisms of vesicle exocytosis Molecular mechanisms of vesicle endocytosis</td>
<td>Chapter 8/12</td>
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<td>Oct 10</td>
<td>Synaptic</td>
<td>Janet Richmond/John Leonard</td>
<td>Transmission-postsynaptic receptors/pharmacology Ionotropic receptors-ion permeability</td>
<td>Ch 9/10</td>
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<td>Oct 14</td>
<td>Cholinergic</td>
<td>John Leonard</td>
<td>Transmission</td>
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First Hour Exam, FRIDAY SEPTEMBER 30 COVERS THROUGH CHAPTER 7
Oct 17  John Leonard  Glutamatergic transmission
Janet Richmond  Neuro-Pharmacology  Chapter 13
Oct 19, 21  GABAergic/glycinergic transmission
Biogenic amines and nonclassical neurotransmitters
Peptides and unconventional neurotransmitters

Oct 24  Janet Richmond  Molecular signaling within neurons  Chapter 11
Signaling strategies-G-protein coupled receptors
Second messenger cascades-Calcium signaling
Cyclic nucleotides and phospholipids derivatives

Oct TBA  Comer Undergraduate Neuroscience Seminar  Dr. Janet Richmond

Janet Richmond  Neuronal signal transduction pathways  Chapter 11
Oct 31  Temporal consequences of G-protein activation
Signaling cascades in LTP
Receptor tyrosine kinases

Second Hour Exam, MONDAY NOVEMBER 7 COVERS THROUGH CHAPTER

Dave Wirtshafter  Early Brain Development
Nov 09  Birth, Migration and Differentiation of Neurons and Glia
Construction of Neural Circuits

Dave Wirtshafter  Neuroanatomy I
Nov 14  Neurohistology
Basic Morphology of the Vertebrate Nervous System and Its Coverings
Spinal Cord and Peripheral Nervous System

THANKSGIVING HOLIDAY Nov 24-25

Dave Wirtshafter  Neuroanatomy II
Nov 21  Brain Stem and Cranial Nerves
Cerebellum and Basal Ganglia

Dave Wirtshafter  Neuroanatomy III
Nov 28  Cerebral Cortex and Thalamus
Limbic System and Hypothalamus
Invertebrate Nervous Systems
Evolution of Nervous Systems

FINAL EXAM, Monday DECEMBER 5th, 1-3 PM, COMPREHENSIVE
DISABILITY ACCOMMODATION
The University of Illinois at Chicago is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at UIC. Students with disabilities who require accommodations for access to and/or participation in this course are welcome, but must be registered with the Disability Resource Center (DRC). You may contact DRC at 312-413-2183 (v) or 312-413-0123 (TTY) and consult the following:
http://www.uic.edu/depts/oaa/disability_resources/faq/accommodations.html

ACADEMIC INTEGRITY
As an academic community, UIC is committed to providing an environment in which research, learning, and scholarship can flourish and in which all endeavors are guided by academic and professional integrity. All members of the campus community—students, staff, faculty, and administrators—share the responsibility of ensuring that these standards are upheld so that such an environment exists. Instances of academic misconduct by students will be handled pursuant to the Student Disciplinary Policy:
http://dos.uic.edu/docs/Student_Disciplinary_Policy.pdf

RELIGIOUS HOLIDAYS AND OBSERVANCE
Students who wish to observe their religious holidays shall notify the faculty member by the tenth day of the semester of the date when they will be absent unless the religious holiday is observed on or before the tenth day of the semester. In such cases, the student shall notify the faculty member at least five days in advance of the date when he/she will be absent. The faculty member shall make every reasonable effort to honor the request, not penalize the student for missing the class, and if an examination or project is due during the absence, give the student an exam or assignment equivalent to the one completed by those students in attendance. If the student feels aggrieved, he/she may request remedy through the campus grievance procedure.
http://oae.uic.edu/docs/ReligiousHolidaysFY20152017.pdf

GRIEVANCE PROCEDURES
UIC is committed to the most fundamental principles of academic freedom, equality of opportunity, and human dignity involving students and employees. Freedom from discrimination is a foundation for all decision making at UIC. Students are encouraged to study the University's "Nondiscrimination Statement". Students are also urged to read the document "Public Formal Grievance Procedures". Information on these policies and procedures is available on the University web pages of the Office of Access and Equity:
http://www.uic.edu/depts/oa