

SYLLABUS
Neurobiology (BIOL 635), Spring 2016

GENERAL INFORMATION

Schedule:

Lecture/Discussion: Tuesdays and Thursdays 10:05 AM – 11:20 AM; Coker Life Sciences 303

Lab: Tuesdays and Thursdays 11:40 AM – 2:25 PM; Coker Life Sciences 303

Instructor: Dr. Daniel I. Speiser

Office: CLS 606

Phone #: 803-777-6597

Email: speiser@mailbox.sc.edu

TA: Luke Havens

Office: CLS 606

Email: lukethavens@gmail.com

Note: Your Instructor and TA would prefer to be contacted by email or in person. If you email us between 9am and 5pm, we will do our best to respond the same day. Do not expect immediate responses to emails sent after normal work hours (i.e. later than 5pm) or on weekends.

Website: See Blackboard for documents and announcements.

Office Hours: Dr. Speiser will be available to talk during and after lab on Tuesday and Thursday. If a separate appointment is necessary, please email Dr. Speiser with a proposed time and an outline of the topic you want to discuss.

Required Text: Text (mostly PDFs of primary literature) will be made available on Blackboard.

Other Required Resources: You will need some sort of calculating device that can handle logs, exponents, and roots. A graphing calculator will work, so will a smart phone or a tablet with the appropriate app(s).

Graduate Students: As this is a 600-level class, it is available to graduate students as graduate credit. Graduate students will be expected to prepare and be evaluated on an additional specific assignment, developed through discussion with the instructor.

Students with diagnosed learning disabilities: Please consult with the instructor (in person or by email) to make arrangements. These arrangements will be coordinated through the Office of Student Disability Services.

COURSE DESCRIPTION

Neurobiology (BIOL 635), taught by Dr. Daniel Speiser, is a discussion- and lab-based course that introduces students to the physiological components and simple circuits that make the complex nervous systems of animals possible. The seminar portion of the course will be dedicated to lectures, discussions, problem sets, and writing assignments concerning such topics as the resting potentials of cells, the generation and transmission of action potentials, synaptic connections between neurons, simple neural circuits, and the evolution of nervous systems. In lab, students will: learn how to take electrophysiological recordings from live animals (invertebrates only); build simple, animal-inspired robots that monitor and respond to changing sensory inputs; and practice designing, conducting, interpreting, presenting, and evaluating experiments in the field of neurobiology.

Neurobiology should establish a foundational knowledge for students continuing in a variety of professional careers, ranging from biological research to engineering to medicine. It is my hope that the course helps students appreciate both the history and future of neurobiology, as well as the care, persistence, and creativity that it takes to conduct experiments in neurobiology successfully.

LEARNING OUTCOMES

Successful students will:

1. learn the fundamental mechanisms by which neurons function and communicate, in a manner allowing translation of these processes to higher neuronal function, including sensory integration, behavior, learning, and memory;
2. develop hands-on skills working with electrophysiological instrumentation;
3. improve their ability to design and conduct experiments and to interpret the data they collect;
4. read and discuss scientific papers together, learning how to perform effective literature research and how to read and evaluate content of scientific literature;
5. improve their communication skills in written and oral presentation;
6. apply the skills and knowledge that they gain to self-directed projects including a mock grant proposal (on a topic of their choice) and an independent lab-based project (again on a topic of their choice).

COURSE EXPECTATIONS

Fundamentals: Neurobiology builds on a foundation of general biology, mathematics, physics, and chemistry. Beyond covering the mechanisms underlying the function of nerves and nervous systems, BIOL 635 will help students develop their skills as writers and presenters of science. Students will also gain experience formulating hypotheses, reviewing primary literature, designing experiments, and taking electrophysiological recordings.

Schedule: A *tentative* timeline for the course is posted on Blackboard. Any changes or clarifications will be announced in class and on Blackboard. The course is divided into two phases, one before Spring Break and one after. The first phase will involve looking back at the field of Neurobiology from where we stand today. What do we think we know and why do we think we know it? In lecture, Dr. Speiser will lead discussions delving into the mechanisms underlying action potentials, synapses, and simple neural circuits. In lab, students will learn the basics of neurophysiology by following a series of guided exercises. The second phase of the course will involve looking forward into the unknown. What are the next big questions and how might we go about exploring them? In lecture, each student will – through a series of written drafts – develop an original research proposal. In lab, they will design and conduct an independent research project, the results of which they will present at the end of the semester.

Attendance: You are expected to be present for **all lectures and labs**. Due to the small size of the class and the collaborative nature of the labs, missing class is detrimental not only to you, but to your classmates as well. Please take this responsibility to heart.

Notes: All students are expected to take notes during lecture. Do not expect that lecture notes will be made available electronically.

Participation: I expect you to participate actively during lecture, discussion, and lab.

Late Assignments: Overdue assignments will be penalized a full grade per day that they are late.

Extra Credit: There will be no opportunities for extra credit. Please focus your efforts on the assignments and lab projects.

Blackboard: Please check Blackboard frequently for updates.

GRADING

Your grade for Neurobiology will be the sum of points earned in lecture and lab (out of 400 total points possible). Details for all of these assignments will be provided as we proceed through the course. For lecture and discussion, the assignments break down as follows:

50 points	Problem sets (exact # TBD)
50 points	Participation
10 points	Research proposal topic
20 points	Research proposal paper presentation
20 points	Research proposal rough draft
<u>50 points</u>	<u>Research proposal final draft</u>
200 points	Total Possible

For lab, the assignments and points break down as follows:

60 points	Lab group presentations (3 of them, 20 points each)
40 points	Participation and lab notebook
<u>100 points</u>	<u>Independent Projects</u>
200 points	Total Possible

Grades are based on the accumulation of points. The numbers of points necessary to earn each letter grade are as follows:

A	≥ 360.0	C	280 – 299
B+	340 – 359	D+	260 – 279
B	320 – 339	D	240 – 259
C+	300 – 319	F	< 240

CLASSROOM POLICIES

- Students who are engaged in distracting behaviors will be asked to stop, and if necessary, directed to leave. The instructor is the sole arbiter of what is and what is not distracting.
- **Please silence your mobile devices during lecture and discussion starts. You are welcome to use your mobile devices to take notes or to look up information during lab.**
- If you are late, please enter the room quietly.
- If you have a question during lecture or discussion, please ask it! During lab, however, please try to solve problems on your own to the greatest extent possible. You can learn a lot through trial-and-error and getting better at research – to a large extent – involves getting comfortable with your research failing.
- **If you must lecture or lab for a legitimate reason, you must seek permission from me in advance.** Permission to miss lecture or lab will not be granted retroactively.
- Please note: lying to your professors is a violation of the Honor Code. I am obligated to report any suspected violations of the Honor Code to the Office of Academic Integrity.
- **You are expected to practice the highest standards of academic integrity.** Any deviation from the University of South Carolina Honor Code will result in a minimum of a zero score on the relevant assignment, and may result in additional, more severe disciplinary measures as determined by the Office of Academic Integrity. The Honor Code states: “It is the responsibility of every student at the University of South Carolina Columbia to adhere steadfastly to truthfulness and to avoid dishonesty, fraud, or deceit of any type in connection with any academic program. Any student who violates this Honor Code or who knowingly assists another to violate this Honor Code shall be subject to discipline.” For more information, see the Carolina Community Student Handbook.
- If you are curious about what might or might not count as plagiarism, please ask.
- Finally, **course materials may not be redistributed** to others in any manner, including, but not limited to, electronic copies online. Video recordings are prohibited. Violations will be referred to the Office of Academic Integrity and may result in expulsion and/or legal action, even after the course is over. The only possible exceptions to these rules are those granted through the Office of Student Disability Services.