

# BIOL3833: Introduction to Neurobiology

Fall Semester 2017

Tuesday and Thursday 12:00-1:30, DaHT105 (Dale Hall Tower 105)

**Instructor:** Dr. Michael Markham (Richards Hall 411A)  
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Office hours: By appointment



**A Brief Course Description:** This course will introduce you to the core operational principles of neural systems, including basics of membrane biophysics, cellular excitability, network properties, and neural basis of behavior.

**Class website:** All course related materials will be posted on the class website:  
[www.BIOL3833.net](http://www.BIOL3833.net)

Posted materials include the required class readings, detailed assignments, required resources and a great deal of supplemental materials (scientific papers, announcements, discussion questions, changes in scheduling, etc).

**Canvas:** We will use the university's new learning management system, Canvas, for a number of course-related activities, including discussion boards, online collaboration, and online quizzes. You can find it online at <http://canvas.ou.edu>

**Activity groups:** For in-class activities and small projects, students will work together in groups of 4 or 5. I will assign students to groups, and I expect that students will remain in their groups for the entire semester. For many of the in-class activities, it makes sense to divide up duties among different members of the group, and I do not expect that each member of a group will perform each duty entirely evenly. However, each student should try as much as possible to participate in all aspects of the group activities – this is how you will learn what you need to know for the exams!

**Textbooks and Readings:** You do not need to purchase a textbook for this course. The books and readings for the course are all available online free of charge. Readings will include online textbooks, scientific articles from the primary literature, and texts that I have written for this course. Assigned readings will be posted on the course website. We will also use neural simulation software that will be made available to you at no cost.

**Policies:** This is an upper division class. You are expected to attend class, participate in class discussions, and work outside of class to understand and master the material we cover. It is very important that you arrive to class on time, especially because quizzes will be given at the beginning of class. (Quiz dates will be posted on the class website). If you are late to class and the quiz has begun, you will have the remainder of the allotted time to complete the quiz; however, if the quizzes have all been completed by the time you arrive, you will not have the opportunity to take the quiz. Make up quizzes, exams, and assignments are only allowed for verified medical reasons or death in the immediate family. Assignments turned in late will be reduced in grade by 10% per day.

Any behavior or conduct that interferes with other students' ability to learn or my ability to teach the class will not be tolerated, one polite request to cease and desist will be followed by removal from the classroom if the problem persists.

**Academic integrity:** The University of Oklahoma seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work

from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. If you are at all unclear about any aspect of academic integrity, detailed information on the definitions and consequences of academic dishonesty can be found at [http://integrity.ou.edu/files/Academic\\_Misconduct\\_Code.pdf](http://integrity.ou.edu/files/Academic_Misconduct_Code.pdf).

Cheating and plagiarism are (of course) against University rules, and these are also actions that I take extremely seriously. Academic dishonesty will not be tolerated. Any student caught cheating will be reported to the Office of Academic Integrity and any form of academic dishonesty will result in a grade of "F" for the course.

**Statement for students with disabilities:** The University of Oklahoma will reasonably accommodate otherwise qualified individuals with a disability unless such accommodation would pose an undue hardship or would result in a fundamental alteration in the nature of the service, program, or activity or in undue financial or administrative burdens. The Disability Resource Center provides support services to students with disabilities, and is committed to the goal of achieving equal educational opportunity and full participation for students with disabilities. Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so we can arrange accommodations necessary to ensure full participation and facilitate your educational opportunities.

**Religious observance policy:** It is the policy of the University of Oklahoma to excuse the absences of students that result from religious observances and to provide without penalty for the rescheduling of examinations and additional required classwork that may fall on religious holidays. If you will miss class for religious observance, please notify me in advance so we can more easily make arrangements to accommodate your absence.

### **Grading:**

Grades will be determined by a standard percentage scale:

A = 90-100%; B = 80-89%; C = 70-79%; D = 60-69%; F = all the rest.

### **Grade Determination BIOL 3833**

	<b>Number</b>	<b>Points each</b>	<b>Total</b>	<b>% of Grade</b>
Online quizzes	12	5	60	15
In-class quizzes	6	20	120	30
STEPS	10	1	10	2.5
Homework	6	15	90	22.5
Exams	2	60	120	30
		<b>Total:</b>	<b>400</b>	<b>100</b>

### About the Assignments

- Online quizzes / Equizzes (5 points each) You can take these (through Canvas) whenever you want, as many times as you want. We keep your highest score. The catch? The questions can be hard and you have to complete the 10-question quiz in 5 minutes. You get a different set of questions every time you take the quiz.
- In-class quizzes These will be 20-question quizzes that you take in class. The questions will cover material from the two previous quizzes and will be drawn from the same question banks so you should know what to expect and how to do it. You will take these quizzes in class through Canvas so bring your laptop/tablet to class on quiz days. Quizzes will have a time limit of 15 minutes, so be prepared!
- Exams (60 points each) The exams are more in-depth and will be much harder than quizzes because you will be asked to apply the knowledge and skills you have learned to novel situations.
- Homeworks (15 points each) Homework assignments will get you ready for the exams by asking you to analyze new situations based on principles you have learned in class.
- STEPs (1 point each). Simple Tasks Easy Points. Stuff I need you to do so I bribe you to do it.

## TENTATIVE CLASS SCHEDULE (Check CANVAS for updates on assignments)

Week	Date	Topic	In-class Activity	In-class quiz - beginning of class
1	8/22/2017	Organizational	Info sheet concept map	
	8/24/2017	Passive properties	Lecture	
2	8/29/2017	Passive properties	Simulations 1	
	8/31/2017	Cable properties	Lecture / Discussion	
3	9/5/2017	Ionic gradients	Lecture	
	9/7/2017	Ion channels 1	Lecture	
4	9/12/2017	Ion channels 1	Simulations 2	Quiz 1 - Passives and Ionic Gradients
	9/14/2017	Ion channels 1	Discussion & Lecture	
5	9/19/2017	The action potential	Lecture	
	9/21/2017	The action potential	Simulations 3	
6	9/26/2017	Ion channels 2	Lecture	Quiz 2 - Ion channels & action potential
	9/28/2017	Ion channels 2	Simulations 4	
7	10/3/2017	Spike patterning	Lecture	
	10/5/2017	Spike patterning	Simulations 5	
8	10/10/2017	Spike Patterning	Simulations 5	Quiz 3 - Ion channels / spike patterning
	10/12/2017	Spike Patterning	Simulation/discussion	
9	10/17/2017	Wrap up / Exam prep		
	<b>10/19/2017</b>	<b>Exam 1</b>	<b>Exam</b>	<b>Exam 1 (10/22)</b>
10	10/24/2017	Synaptic transmission	Lecture	
	10/26/2017	Synaptic transmission	Simulations 6	
11	10/31/2017	Synaptic transmission	Simulations 6	
	11/2/2017	Dendrites	Lecture	
12	11/7/2017	Intro to Systems	Organizational	Quiz 4 - Synapse and Dendrites
	11/9/2017	Sensory - Hearing	Lecture	
13	11/14/2017	Sensory - Hearing	Group activities	
	11/16/2017	Sensory - Vision	Lecture	
14	11/21/2017	Sensory - Vision	Group activities	Quiz 5 - Sensory Systems
	11/23/2017	<b>Thanksgiving</b>		
15	11/28/2017	Learning & Memory	Lecture	
	11/30/2017	Learning & Memory	Group activities	
16	12/5/2017	Learning & Memory	Lecture	Quiz 6 - Learning/memory
	12/7/2017	Learning & Memory	Group activities	
<b>17</b>	<b>12/12/2017</b>	<b>Tuesday 1:30-3:30 Final Exam</b>		<b>Exam 2 (12/12)</b>