

# BIOL 3833: Introduction to Neurobiology

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## Dr. Willis

**kwillis@ou.edu**

**Class: Tu/Th 12:00pm-1:15pm, Dale Hall Tower 105**

**Office hours: W 1pm-3pm, Richards Hall 102 (until further notice)**

## *Learning Goals*

- 1) Understand the structure and function of nervous systems at multiple levels:
  - a. Cellular level
  - b. Systems level
  - c. Organismal level
- 2) Critically evaluate primary literature
- 3) Clearly communicate what you have learned in both written and oral forms

## *Class Website*

All course-related materials will be posted on Canvas. Posted materials include the required class readings, detailed assignments, required resources, and supplemental materials (scientific papers, announcements, discussion questions, changes in scheduling, etc.). We will use Canvas for a number of course-related activities, including discussion boards, online collaboration, and online quizzes.

## *Activity Groups*

For in-class activities and small projects, students will work together in groups. I will assign students to groups. Ideally, 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. There will be 3 group member evaluations (online and confidential) during the semester that will contribute to your final grade (5 points available for each evaluation). Each student in the group will be assigned the same grade except in circumstances in which it is clear that a group member did not contribute to the assignment in an egregious manner (e.g. did not attend any class during which the work was done)

## *Textbooks, Readings, and Other Resources*

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 textbook (<http://nba.uth.tmc.edu/neuroscience/m/index.htm>) and scientific articles which will be posted on the course website. The online textbook sometimes does not have full functionality. Often closing and reopening your browser will fix this or you can use a different browser. Additionally, make sure all your browser plug-ins are up to date. We will also use neural simulation software available to you at no cost (<http://www.eotnprogram.org/>). The optional course textbook is *Neuroscience: Exploring the Brain* by Bear, et al, 4<sup>th</sup> edition. Equivalent readings for the optional course textbook will be listed. Another online textbook is available through NIH (<https://www.ncbi.nlm.nih.gov/books/NBK10799/>).

### *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 that we will cover. It is very important that you arrive to class on time, especially because quizzes will be often given at the beginning of class. 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 allowed for verified medical reasons, death in the immediate family, religious observances, and university activities, all in accordance with university policy.

*Assignments turned in late will be reduced in grade by 10% per day. The 10% reduction starts immediately after the deadline and increases by 10% every 24 hours after the deadline.*

Any behavior or conduct that interferes with other students' ability to learn or my ability to teach 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. Work from other classes should not be reused. 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 against University rules, and these are 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.

### *Communication*

The easiest way to contact me is via email ([kwillis@ou.edu](mailto:kwillis@ou.edu)). You may also communicate via Canvas. I do my best to respond to emails the same working day. If I don't respond to your email within 24 hours, feel free to resend it. Emails regarding exam *content* must be sent before 9pm the day before the exam in order to guarantee my response.

### *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. You may reach the DRC by email at [drc@ou.edu](mailto:drc@ou.edu)

or by phone at (405) 325-3852. You may contact the DRC without notifying me if you prefer to keep your disability confidential.

#### *Adjustments for Pregnancy/Childbirth Related Issues*

Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact me as soon as possible to discuss. Generally, modifications will be made where medically necessary and similar in scope to accommodations based on temporary disability. Please see [www.ou.edu/content/eoo/faqs/pregnancy-faqs.html](http://www.ou.edu/content/eoo/faqs/pregnancy-faqs.html) for commonly asked questions.

#### *Title IX*

Title IX makes it clear that violence and harassment based on sex and gender is a Civil Rights offense subject to the same kinds of accountability and the same kinds of support that are applied to offenses against other protected categories such as race, national origin, etc. If you or someone you know has been harassed or assaulted, you can find the appropriate resources from the Equal Opportunity Office (<https://www.ou.edu/eoo.html>). For any concerns regarding gender-based discrimination, sexual harassment, sexual misconduct, stalking, or intimate partner violence, the University offers a variety of resources, including advocates on-call 24-7, counseling services, mutual no contact orders, scheduling adjustments and disciplinary sanctions against the perpetrator. Please contact the Sexual Misconduct Office 405-325-2215 (8-5, M-F) or OU Advocates 405-615-0013 (24-7) to learn more or to report an incident. One resource outside the university is the Women's Resource Center <http://wrcnormanok.org/contact-us/>

#### *Equal Opportunity Office*

The University of Oklahoma, in compliance with all applicable federal and state laws and regulations does not discriminate on the basis of race, color, national origin, sex, sexual orientation, genetic information, gender identity, gender expression, age, religion, disability, political beliefs, or status as a veteran in any of its policies, practices, or procedures. This includes, but is not limited to: admissions, employment, financial aid, housing, services in educational programs or activities, or health care services that the University operates or provides. Inquiries regarding non-discrimination policies may be directed to: Bobby J. Mason, University Equal Opportunity Officer and Title IX Coordinator, 405-325-3546, [bjm@ou.edu](mailto:bjm@ou.edu), or visit <http://www.ou.edu/eoo.html>.

#### *Mental Health*

Your mental health is important. Professional services are available at low cost through the university counseling center (<https://www.ou.edu/ucc>)

#### *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.

### *University Activity Absences*

Documentation for absence due to a sponsored university activity (such as intercollegiate athletics or other competitions) must be provided in advance and in accordance with university policies.

### *Grading*

Grades will be determined on a standard percentage scale. There is no curve

A = 90-100% (450-500)

B = 80-89%; (400-449)

C = 70-79%; (350-399)

D = 60-69%; (300-349)

F = 59% and below (0-299)

### *Grade Composition (Out of 500 Points)*

- Homework (15 points each x 4, 12%)  
Homework assignments will get you ready for the exams by asking you to analyze new situations based on principles you have learned in class.
- Group evaluations/participation (5 points each x 3, 3%)  
Each group member will fill out confidential online surveys about each member's contribution to the group. These will collectively comprise your group evaluation score. One point of each five-point evaluation will be based on general class participation.
- Online quizzes (5 points each x 10, 10%)  
There will be 11 timed online quizzes over the course of the semester. Your lowest quiz score will be dropped.
- In-class quizzes (5 points each x 7, 7%)  
These unannounced quizzes will be given in class throughout the semester. Your 7 highest scores (out of about 8-10) quizzes will be kept.
- In-class group assignments (15 points each x 4, 12%)  
These are varied assignments that will largely be done during class. *If you are not in class to work on these assignments, you will have contribute in a manner determined by your group members or do the assignment on your own.*
- Regular exams (85 points each x 2, 38%)  
There will be two (non-cumulative) exams during the semester.
- Final exam (110 points x 1, 22%)  
The final exam is cumulative. If your percent score on the final is higher than either one or both of your regular exams, I will change **one** of your regular exam score to be the same percentage as your final exam.  
Example: 70% exam 1 (60/85); 90% exam 2 (77/85); 85% final (94/110). I'll replace your exam 1 score with the 85% from your final, changing your points on exam 1 to 72/85

- Extra credit (up to 10 points x 1, 2%)  
Choose a recent primary research article (not a review; published within the last 5 years) that is related to a topic we cover in class and write a 1-2 page (12 pt, standard font, single spaced) summary. Points will be earned based on the quality of your analysis of the paper and relating it to course material. A general writing rubric can be found on Canvas. Articles must be approved by Dr. Willis before you turn in your summary. Each student may submit only one article summary.

### *Examination Regrade Policy*

Regrading examinations will be considered as an unusual rather than a routine request. Exams must be written in pen to be considered for regrading. A request for regrading of an examination must be submitted to the professor in writing (on a separate sheet of paper with a brief explanation for the request), along with the original exam. A regrade request **MUST** be submitted by the end the next class meeting after a semester examination was returned to the class (not after you pick up an exam if you did not attend the lecture when the exam was available for provision to all students), which is usually to first or second class period after the examination date. Only one cycle of regrading will be considered per examination. By submitting an exam for regrading, you agree to accept the score of the entire regraded examination, not the original score. In other words, I will read and grade the exam again, and any errors detected that are in your favor or not in your favor would be corrected and included in determining your new score. If you think you have grounds for a grade review request you must construct an argument for any modifications in your score based on the specifics of your work compared to the instructions and the criteria for grading. For example, "The instructions state X, the criteria states Y, I did Z, therefore, I deserve to get credit (x number of points) for my work." The more specific you are the better. Due to time constraints, the final examination will not be considered for regrading.

### *Miscellaneous Items*

- Some of the primary literature we will read and discuss describes animal experiments in detail that might make you uncomfortable. You are not required to understand the minutiae of these experiments
- In order to improve group function, I may change the composition of the groups.
- You are free to take notes on your computer but do not do anything during class that could distract other students
- Bring your computer to class for group work and other activities
- **Talk to me when a problem starts rather than later so we can work together to find a good solution**

BIOL 3833 Tentative Course Schedule

Date	Topic	Reading	Assignment/Activity
Aug 21	Course logistics; Neuroanatomy & Neural coding	eTextbook: 1.intro & 1.8 Bear: ch 7	
Aug 23	Neural coding; Comparative neuroanatomy & brain evolution	eTextbook: 1.intro & 1.8 Butler & Hodos ch. 6 Bear: ch 7	Online anatomy lab
Aug 28	Resting potentials & action potentials	eTextbook: 1.intro & 1.1-3 Bear: ch 3	Quiz 1 Finish online anatomy lab Group assignment 1 due Neuron simulations
Aug 30	Resting potentials & action potentials	eTextbook: 1.intro & 1.1-3 Bear: ch 3 & 4	Neuron simulations Group contracts uploaded
Sept 4	Resting potentials & action potentials	eTextbook: 1.intro & 1.1-3 Bear: ch 4 Hodgkin & Huxley, 1952	Neuron simulations
Sept 6	Synaptic transmission	eTextbook: 1.4-7,9 Bear: ch 5	Quiz 2 Group assignment 2 due
Sept 11	Synaptic transmission	eTextbook: 1.4-7,9 Bear: ch 5 & 6	HW 1 due Group evaluation 1 due
Sept 13	Synaptic plasticity	eTextbook: 1.7,9 Bear: Ch 23 (805-19)	Quiz 3
Sept 18	Synaptic plasticity & Review	eTextbook: 1.7,9 Bear: ch 25	HW 2 due
Sept 20	<b>Exam 1</b>		
Sept 25	Vision	eTextbook: 2.14-15 Bear: ch 9 & 10	
Sept 27	Vision	eTextbook: 2.14-15 Bear: ch 9 & 10	Group assignment 3 due
Oct 2	Hearing	eTextbook: 2.12-13 Bear: ch 11	Quiz 4
Oct 4	Hearing & vestibular	eTextbook: 2.10-13 Bear: ch 11	Group evaluation 2 due
Oct 9	Somatosensation	eTextbook: 2.2,4-5 Bear: ch 12	Quiz 5

Oct 11	Nocioception	eTextbook: 2.6-8 Bear: ch 12	
Oct 16	Olfaction	eTextbook: 2.9 Bear: ch 8	Quiz 6
Oct 18	Gustation	eTextbook: 2.9 Bear: ch 8	Quiz 7
Oct 23	Non-human senses	Nagle, 1974	
Oct 25	Multisensory integration	Bulkin & Groh 2006 Knudsen & Knudsen 1985	Quiz 8
Oct 30	Multisensory integration & Review		HW 3 due
Nov 1	Multisensory integration & Review		
Nov 6	<b>Exam 2</b>		
Nov 8	Motor systems	eTextbook: 3.1-2 Bear: ch 14	
Nov 13	Motor systems & Sensory-motor integration	eTextbook: 3.3-6 Bear: ch 14	Quiz 9
Nov 15	Motor systems & Sensory-motor integration	eTextbook: 3.3-6 Bear: ch 14	
Nov 20	Student-chosen topics	TBD	
Nov 22	<b>Thanksgiving</b>	No class	
Nov 27	Student-chosen topics	TBD	Quiz 10 HW 4 due
Nov 29	Student-chosen topics	TBD	Group assignment 4
Dec 4	Student-chosen topics	TBD	Quiz 11 Group Evaluation 3 due
Dec 6	Buffer time Review for final		Last day to turn in bonus
Dec 13	FINAL	1:30-3:30 PM	