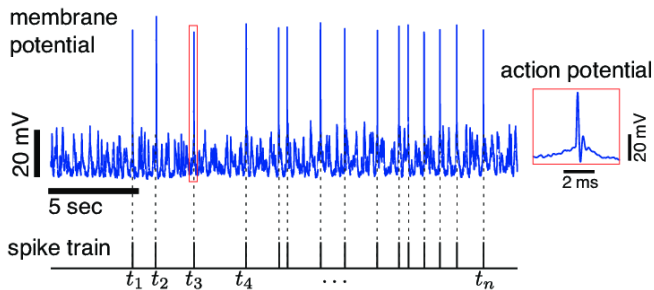
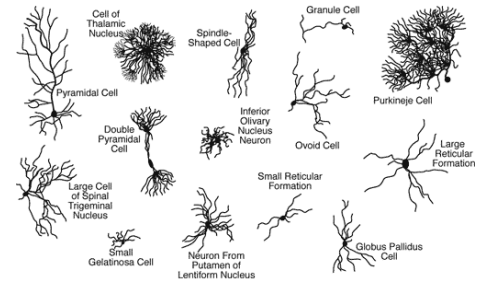


**BIOLOGY 351 Fall 2020**  
**PRINCIPLES OF NEUROBIOLOGY**  
*Online lectures and Face-to-Face: Tuesday or Thursday 1:40-2:55 pm*  
*Rita Hollings Science Center (RITA) 152*

**Instructor: Dr. Jeffrey D. Triplehorn**  
**E-mail: [triplehornj@cofc.edu](mailto:triplehornj@cofc.edu)**  
**Office location: RITA 117**  
**Phone: 953-5848**  
**Office hours: By appointment conducted via Zoom**



### 1. Course requisites

*Prerequisites:* PSYC 103, BIOL 111/BIOL 111L, BIOL 112/BIOL 112L; BIOL 211 or PSYC 214

*Co-requisite or Prerequisite:* MATH 250 or equivalent course in statistics

*Cross-listing:* PSYC 351

### 2. Course description

The principle goal of this course is to provide a rigorous introduction to cellular and molecular neuroscience. The course will cover topics that include the ionic basis of neuronal excitability, the principles of neural communication and neural interactions, and neurotransmitter systems. During the course, you will develop an understanding of how processes occurring at the cellular level form the basis of functioning nervous systems, including how these processes relate to normal behavior and neural pathologies.

### 3. Instructional objectives and student learning outcomes

- a. Identify and explain the cellular and molecular principles underlying the function of neurons.
- b. Describe how the historical contributions of neuroscience research contributed to the current understanding of the nervous system.
- c. Describe techniques employed in neuroscience research.
- d. Relate how the cellular and molecular principles of neuronal function relate to disorders of the nervous system.
- e. Demonstrate written skill sets by applying course material to current issues in neuroscience and neuroscience research.

#### 4. Required reading and materials

From Neuron to Brain, 5<sup>th</sup> ed., Nicholls, Martin, Fuchs, Brown, Diamond, Weisblat; Sinauer, 2012

Any additional required readings will be posted on OAKS. There may also be videos that are required for viewing outside of class. These will expand upon the material presented in class.

#### 5. Course and attendance policies

During the first three weeks, **lectures** will be presented **online, asynchronously** using VoiceThread and will be available in OAKS.

Beginning the week of September 14<sup>th</sup>, students are scheduled to be back on campus. *Due to social distancing restrictions*, all students enrolled in the course cannot occupy the room at the same time.

Therefore, **lectures will be presented face-to-face, one time per week for 75 minutes per lecture as scheduled with one lecture presented asynchronously online.** The class will be divided into two groups, with one group attending face-to-face on Tuesday and the other group attending face-to-face on Thursday, for the same lecture material.

The other lecture material for the week will be presented asynchronously online. **Although asynchronous, the online lecture will be continuous with the face-to-face lectures. In other words, you need to watch the online lectures before that week's face-to-face lecture.** The online lectures will be available on Friday in order to be viewed prior to face-to-face lectures the following week. **Refer to the course schedule (Section 16) to see the alternating pattern of online and face-to-face lectures.**

Although attendance is not taken, students that do not attend regularly or view the online lectures and keep up with the material generally do not do well on exams. Class time/online lectures will be used to present material, provide demonstrations and view video clips. Discussions will take place in face-to-face classes, on the Discussion board via OAKS, and in requested responses in VoiceThread lectures. The textbook can be a little challenging, but it includes much of the material I include in lectures (particularly the figures). You may find it helpful to read the book after the lecture. Exams will focus on lecture material (online and face-to-face) and corresponding information from the book.

If there is an issue either viewing/keeping up with the online lectures or attending face-to-face lectures, I encourage you to contact me as soon as possible. Both online and face-to-face lectures, will use PowerPoint slides and blackboard (face-to-face) or whiteboard (online). Handouts will be provided ahead of time on OAKS to help notetaking. Complete slides will be posted on OAKS *after* lecture.

During the first three weeks of online lectures, I will schedule a Zoom meeting for the class *each Thursday during the class period* to answer any questions you have on the material in the online lectures. The Zoom meeting is *purely voluntary*.

After students return to campus starting the week of September 14, one hour question and answer Zoom sessions will be conducted Monday nights from 6-7 pm, which are also voluntary.

During the period of online only and face-to-face classes, I will also be available to meet with students by scheduling a Zoom meeting; just email me to setup a meeting time that works for both of us.

If the online only period is extended during the semester, we will continue with the same course format as the first three weeks of the semester until students do return to campus.

#### 6. Expectations of the students

Remember that you have a responsibility for you own education. I am here to facilitate you in this process. You accept this responsibility by being prepared, being attentive and participating in class, and reviewing materials prior to class. This course will cover a lot of material. If you are having difficulties with the material, seek help early. I can only help you if you come see me so that we can work together.

## 7. Reaching your instructor

If you have any questions, please use email to reach me. During the week, I will deliver my responses for emails within 24 hours. My response emails will be delivered within 48 hours on the weekend. I expect you to regularly log into OAKS to review plans and expectations for course activities and to be informed of course updates posted in the news feed on the course homepage. Please check your email regularly as I will email updates through OAKS to update you on class events and assignments. **Computer failure or unavailability does not constitute an excuse for incomplete or late assignments.** If you feel uncomfortable with technology, the College offers a number of resources to help you develop your technological competency, in general, but specifically within the context of this online class. Visit

<http://blogs.cofc.edu/studentreadinessforonlinelearning/> to access those resources. If you experience technological problems during the class, please contact me immediately at [triblehornj@cofc.edu](mailto:triblehornj@cofc.edu).

## 8. Technology Policy

**During face-to-face classes, there will be no use of cell phones, computers, iPads, iPhones, etc. during class.** These devices are disruptive to other students in the classroom and to my teaching. If your cell phone goes off during class, you may be asked to leave for the day. All devices are to be turned off and put away (not left on your desk) until class is dismissed.

## 9. Exam policies

Due to the social distance restrictions in the classroom, all exams will be administered online via OAKS on Thursdays during the course time for all students (see lecture schedule, Section 22). The final exam will take place at the scheduled final exam time.

If you know that you are going to miss an exam, you should inform me of this as soon as possible so that we can make other arrangements. Due to the novel situation COVID-19 provides, if you become ill such that you are unable to take the exam, you need to contact me as soon as possible so that we can make other arrangements. It would be best for these requests occur prior to the day (or night) before the exam, the day of the exam, or after the exam. I will follow up requests with a Zoom meeting with the student as soon as possible to discuss arrangements.

Keep in mind that being dishonest about an illness or COVID-related absence is a violation of the Honor Code and students violating the Honor Code will be reported to the Dean of Students.

## 10. Evaluation

Grades will be based on **three exams, a comprehensive final, five discussion posts/lecture participation, one take-home assignment and eight quizzes (see below).**

- **Exams**

Exams will consist of a number of question formats that may include: multiple choice, matching, short answers, short essay and figure completions. Material will be drawn from lectures, lab, class discussions, and the readings.

The exams will be given on the dates indicated on the schedule online during the normal class time for all students. Each student is responsible for knowing when the exams will be given as well as taking the exams on those dates.

Online exams will utilize an exam proctoring service (see *Section 15*).

- **Quizzes**

Quizzes (eight total, drop lowest) will be given roughly every two weeks, according to the schedule. Each quiz is worth 20 points. The format will mostly be fill-in-the-blank, but may also include multiple choice and/or short answer).

The quizzes will be given every Wednesday evening within a window between 7:00-7:30 pm (unless informed otherwise).

Quizzes will cover material indicated on the schedule.

If you have an academic course conflict with the quiz period, please inform me at the beginning of the semester.

If you miss a quiz, contact me in the same manner as missed exams..

- **Discussion posts**

There will be five (5) discussion topics posted throughout the semester. These will require an initial response the first week, followed by responses to three additional posts during the second week.

Each discussion will be worth 20 points. Information about discussion posts will be provided when the first discussion is assigned.

The remaining 10 discussion points will be based on answering questions requested during lectures (VoiceThreads online or face-to-face).

If you are a student with special needs (i.e. a documented learning disability) and you require special arrangements for the exams or course, please refer to *Section 16* below and contact me as soon as possible so that I can accommodate your needs. **Please provide documentation of your special need in writing at the beginning of the semester.**

### 11. Grading policy

Grades will be assigned on the basis of the number of points that you earn at the completion of the course. The number of points and the approximate percentage of the grade are indicated below.

Source	% of Grade	Number of Points
Best exam	20%	200
"Meh" exam	17%	170
Worst exam	15%	150
Final Exam (comprehensive)	20%	200
Discussions	11%	110
Quizzes (8, drop lowest)	14%	140
Take-home Assignment	3%	30
		<b>1000</b>

## 12. Grade assignment

The combined total for all of the above will be 1000 points. Your final grade in the course will be based on a percentage of points based on the College of Charleston grading scheme:

% of Total Points	Point Range	Grade Earned
93% and higher	930-1000	A
90-92.9%	900-929	A-
87-89.9%	870-899	B+
83-86.9%	830-869	B
80-82.9%	800-829	B-
77-79.9%	770-799	C+
73-76.9%	730-769	C
70-72.9%	700-729	C-
67-69.9%	670-699	D+
63-66.9%	630-669	D
60-62.9%	600-629	D-
<60%	<600	F

## 13. Late assignment policy

Due dates for the homework assignment and discussion posts will be provided when assigned. You are expected to turn in assignments on time. Assignment grades will be reduced by 10% for each calendar day late. No assignment will be accepted after ten days late and the grade will be a 0 for the assignment. Please note, computer failure or unavailability do not constitute an excuse for not completing assignments on time.

## 14. College of Charleston Honor Code and Academic Integrity

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student's actions are related more to a misunderstanding will be handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student's file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student's transcript for two years after which the student may petition for the XX to be expunged. The F is permanent. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

*Students should be aware that unauthorized collaboration--working together without permission-- is a form of cheating. Discussion posts, quizzes, and exams (administered in class or online) are individual assignments and no collaboration during the completion of each of these is permitted. All quizzes and exams are considered closed book. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others' exams, fabricating data, and giving or receiving unauthorized assistance.*

Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor.

Students can find the complete Honor Code and all related processes in the *Student Handbook* at <http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php>

### **15. Online Exams with Exam Proctoring**

This course will require the use of an exam proctoring service for the quizzes and exams. The College has purchased a license for Respondus, which is a lockdown browser and monitoring software system and students should not be responsible for the cost of this service. However, since this is a very recent development, if Respondus is not provided as planned, then students will be responsible for registering, scheduling and the cost of the service prior to **exams only**. In either case, instructions and additional information for online proctoring will be provided later in the semester.

### **16. Accommodations for students with disabilities**

Any student eligible for and needing accommodations because of a disability is requested to speak with the professor during the first two weeks of class or as soon as the student has been approved for services so that reasonable accommodations can be arranged. [Center for Disability Services/SNAP](#)

### **17. OAKS**

OAKS, including Gradebook, will be used for this course throughout the semester to provide the syllabus and class materials and grades for each assignment, which will be regularly posted.

### **18. Center for Student Learning**

I encourage you to utilize the Center for Student Learning's (CSL) academic support services for assistance in study strategies, speaking & writing skills, and course content. They offer tutoring, Supplemental Instruction, study skills appointments, and workshops. Students of all abilities have become more successful using these programs throughout their academic career and the services are available to you at no additional cost. For more information regarding these services please visit the CSL website at <http://csl.cofc.edu> or call (843)953-5635.

### **19. Inclement weather, Pandemic, or substantial interruption of instruction**

If in-person classes are suspended, faculty will announce to their students a detailed plan for a change in modality to ensure the continuity of learning. All students must have access to a computer equipped with a web camera, microphone, and Internet access. Resources are available to provide students with these essential tools.

If the College of Charleston closes and members of the community are evacuated due to inclement weather, students are responsible for taking course materials with them in order to continue with course assignments consistent with instructions provided by faculty. In cases of extended periods of institution-wide closure where students have relocated, instructors may articulate a plan that allows for supplemental academic engagement despite these circumstances. Be sure to check email and OAKS for course information during evacuations.

### **20. Mental and Physical Well-being**

At the college, we take every students' mental and physical wellbeing seriously. If you find yourself experiencing physical illnesses, please reach out to student health services (843.953.5520). And if you find yourself experiencing any mental health challenges (for example, anxiety, depression, stressful life events, sleep deprivation, and/or loneliness/homesickness) please consider contacting either the Counseling Center (professional counselors at <http://counseling.cofc.edu> or 843.953.5640 3<sup>rd</sup> Robert Scott Small Building) or the Students 4 Support (certified volunteers through texting "4support" to 839863, visit <http://counseling.cofc.edu/cct/index.php>, or meet with them in person 3<sup>rd</sup> Floor Stern Center). These services are there for you to help you cope with difficulties you may be experiencing and to maintain optimal physical and mental health.



## **21. Food and Housing Resources**

Many CofC students report experiencing food and housing insecurity. If you are facing challenges in securing food (such as not being able to afford groceries or get sufficient food to eat every day) and housing (such as lacking a safe and stable place to live), please contact the Dean of Students for support (<http://studentaffairs.cofc.edu/about/salt.php>). Also, you can go to <http://studentaffairs.cofc.edu/student-food-housing-insecurity/index.php> to learn about food and housing assistance that is available to you. In addition, there are several resources on and off campus to help. You can visit the Cougar Pantry in the Stern Center (2nd floor), a student-run food pantry that provides dry-goods and hygiene products at no charge to any student in need. Please also consider reaching out to your instructor if you are comfortable in doing so.

**16. Schedule** The following schedule represents a tentative plan for the course, subject to change.

Week	Week of	Format (lecture #)	Pages	Quiz	Topic
1	August 24	Online (1)	3-22 159-179		Course Introduction Cells of the Nervous system
		Online (2)			Cells of the Nervous system Vertebrate brain organization
2	August 31	Online (3)	99-111	Quiz 1 (L 1-2) Wed. 9/2	Vertebrate spinal cord and peripheral nervous system Invertebrate nervous systems
		Online (4)			Electrical properties of neurons Electrophysiological techniques
3	September 7	Online (5)	112-128	Quiz 2 (L 3-4) Wed. 9/9	Equilibrium potentials
		Online (6)			Resting membrane potentials
		Online (7)			Action potential generation
4	September 14	In class (8)		Quiz 3 (L 5-6) Wed. 9/16	Action potential generation
		Online (9)	129-141 185-211		Action potential refractory periods Action potential propagation: length constant
5	September 21	Online (10)	243-272		Action potential propagation: Time constant
		No class lecture			Tuesday (9/22): Zoom Q&A session (voluntary for all)
		<b>EXAM I</b>			<b>THURSDAY 9/24 ONLINE synchronous (Lectures 1-8)</b>
6	September 28	In class (11)			Action potential propagation: conduction velocity Current spread in dendrites
		Online (12)	213-241		Synaptic transmission Chemical and electrical synapses
7	October 5	In class (13)		Quiz 4 (L 9-11) Wed. 10/7	Quantal release theory Postsynaptic potentials
		Online (14)	299-316		Synaptic integration G-protein coupled receptors
8	October 12	In class (15)		Quiz 5 (L12-13) Wed. 10/14	2 <sup>nd</sup> messenger systems
		Online (16)			Introduction to neurotransmitters
9	October 19	In class (17)	273-281	Quiz 6 (L14-15) Wed. 10/21	Neurotransmitter receptors and research techniques
		Online (18)			Neurotransmitters: The three "G's" GABA, Glycine, and Glutamate
10	October 26	Online (19)	286-298		Neurotransmitters: Monoamines Neurotransmitters: Dopamine and Parkinson's Disease
		No class lecture			Tuesday (10/27): Zoom Q&A session (voluntary for all)
		<b>EXAM II</b>			<b>THURSDAY 10/29 ONLINE synchronous (Lectures 9-17)</b>
11	November 2	Online (20)			Neurotransmitters: Dopamine and Parkinson's Disease Neurotransmitters: Dopamine and Schizophrenia
		No class lecture			<b>ELECTION DAY</b>
12	November 9	In class (21)		Quiz 7 (L 18-19) Wed. 11/11	Neurotransmitters: Norepinephrine Attention, anxiety disorders, and ADHD
		Online (22)			Neurotransmitters: Serotonin Aggression and Major Depressive Disorder
13	November 16	In class (23)	281-286 300-202 317-323	Quiz 8 (L 20-21) Wed 11/18	Neurotransmitters: Serotonin; a new hypothesis for depression Neurotransmitters: Acetylcholine Neurotransmitters: Acetylcholine disorders and Alzheimer's disease
		Online (24)	323-333		Long term potentiation
14	November 23	<b>EXAM III</b>			<b>TUESDAY 11/24 ONLINE synchronous (Lectures 18-23)</b>
		No lectures			<b>THANKSGIVING</b>
15	November 30	Online (25)			Metamodulation
		Online (26)			Course wrap-up
					<b>FINAL EXAM ONLINE TUESDAY DECEMBER 8; 1-3 PM</b>