

SUNY College at Old Westbury
Biological Sciences
Summer 2018

Course Information:

Cell and Molecular Neurobiology, Course Number BS4500

Lectures meet every Monday through Thursday from 9:00AM to 11:30AM. This course is worth 4 credit hours. An electronic version of the syllabus as well as downloadable copies of the lecture materials can be found on the course Blackboard page.

Instructor Information:

Dr. Jillian Nissen, PhD

Office Number: (516) 876-2731

Email: nissenj@oldwestbury.edu

Office Hours:

Room S-205, NSB

Mondays/Wednesdays 11:30AM-12:30PM

I will respond to your emails within 24 hours from Monday through Friday, and by Tuesday if over the weekend.

Detailed Course Information:

Lecture course designed to familiarize students with intracellular communication mechanisms and how they are used to promote intercellular interactions. Includes concepts as they relate to neurobiology; synaptic transmission, neurophysiology/neuropharmacology, selected topics relating to neurological disorders and drugs of abuse, etc. Completion of BS4400 recommended.

ALL DATES AND LECTURE TOPICS ARE TENTATIVE AND SUBJECT TO CHANGE

Course Textbook:

Neuroscience 6th Edition, by Dale Purves, George J. Augustine, David Fitzpatrick, William C. Hall, Anthony-Samuel LaMantia, Richard D. Mooney, Michael L. Platt, and Leonard E. White.
ISBN 9781605353807

This is the textbook that this class will follow closely. It is possible to be successful in this class without the textbook, as you will not be assessed on materials outside of those covered in lecture or posted on Blackboard. However, it will be much easier to do well if you have the textbook as you can clarify points I cover in lecture with readings. Several lectures will include additional content such as research articles posted on Blackboard.

Course Objectives:

After completing this course, students will understand the following core concepts and have the following competencies:

Core Concepts

1. Evolution

- Understand genetic mutation and its link to neuronal structure and function in an evolutionary context.

2. Structure and Function

- Understand how the molecular structure of signaling components, e.g. neurotransmitters and their receptors, transcription factors, etc., relate to the functional properties of neurons

3. Information Flow, Exchange, and Storage

- Understand signaling mechanisms, such as neuropeptides and neurotransmitters, and regulatory processes, such as inhibitory versus excitatory signals, leading to homeostasis in biological systems.
- Understand changes in cellular activity and function in a genomic context.

4. Pathways and Transformations of Energy and Matter

- Understand energy transactions and energy flow at the biochemical level, and its relation to enzyme function and electrochemical signaling in neurons.

5. Systems

- Understand how dynamic interactions of components at the molecular level relate to higher order cognitive processing and various nervous system pathologies.

Competencies

- 1. Ability to apply the process of science:** Students will understand and apply the process of science through gathering data in the preparation of a review-style research paper.
- 2. Interpreting multiple representations:** Students will be able to analyze information presented in different forms, e.g. tables, figures, flow charts and diagrams.
- 3. Ability to use quantitative reasoning:** Students will be able to apply quantitative reasoning through the application of mathematical algorithms and or models to the study of biological processes, e.g. action potential firing rates, etc.
- 4. Ability to tap into the interdisciplinary nature of science:** Students will analyze concepts using an interdisciplinary approach, e.g. understanding complex processes such as learning and memory from a molecular point of view.
- 5. Ability to communicate and collaborate with other disciplines:** Students will be able to communicate recent advancements in the field of neuroscience both orally (communicating to their professor and their peers) and in written form (written essay exams and a research paper). Students will also be able to communicate complex topics at a high technical level and to laypeople.
- 6. Ability to understand the connection between science and society:** Investigation into current avenues of scientific inquiry will provide students with insight into areas of societal need.

Course Schedule:

DATE	TOPIC	PURVES CHAPTER
5/29	Introduction, Electrical Signaling in Nerve Cells	Chapter 1, 2
5/30	Excitation and Conduction	Chapter 3, 4
5/31	Synaptic Transmission	Chapter 5
6/4	Neurotransmitters	Chapter 6
6/5	Signaling Within Neurons	Chapter 7
6/6	Exam 1	
6/7	Early Brain Development, Neural Circuits	Chapter 22, 23
6/11	Synaptic Plasticity	Chapter 8
6/12	Experience-Dependent Plasticity	Chapter 25
6/13	Learning and Memory	Chapter 30, Article TBD
6/14	Exam 2	
6/18	Neuroimmunology, Repair and Regeneration	Chapter 26, Article TBD
6/19	Disorders and Diseases of the CNS – I	Article TBD
6/20	Disorders and Diseases of the CNS – II	Article TBD
6/21	Neuropharmacology, Drugs of Abuse	Article TBD
6/25	Exam 3	
6/26	Presentations	
6/27	Presentations	
6/28	Final	

Assignment Information:

Exams:

There will be three exams during the course that will cover one third of the course content each. The lowest grade of these three exams will be dropped, and as such **there will not be make-up exams offered.**

The final exam will be in multiple choice format and will be cumulative. This exam cannot be dropped.

In-Class Group Quizzes

Following each lecture a quiz will be given to all students, and is meant to be taken through group discussion. This will be turned in at the end of class for a quiz grade.

Research Project

All students in this class will be assessed on their ability to communicate science to individuals with varying degrees of technical knowledge in the neuroscience field. This project will consist of two parts – a written research paper and a presentation on a topic of interest, subject to approval by the instructor. The research paper will take the form of a short review article, written at a high technical level and intended for an audience that has a substantial background in neuroscience. As for the presentation, this should be formatted as if your audience has no science background at all. Further details will be provided on Blackboard.

If you need additional help with writing, you can visit the Writing Center located in the Library in Campus Center, room L-242. You can make an appointment online at <https://oldwestbury.mywconline.com>, or stop by the Writing Center.

Academic Courtesy and Class Rules:

Please call me Dr. Nissen.

In order to have a constructive and fruitful learning experience together this Summer, I ask that you adhere to these course rules:

- 1) Questions and comments during class should be relevant to the course material.
- 2) You should be in your seat and ready to begin class on time.
- 3) Refrain from using cell phones and other electronic devices during lecture, except in circumstances when we are utilizing them for classwork.
- 4) Packing up your belongings before the end of the class is disruptive not only to the others around you but myself as well.
- 5) Classroom discussion should be respectful and on topic.

Attendance Policy:

I understand that there may be days that you will not be able to make the lectures due to unforeseen circumstances and other obligations. If you miss a lecture, you will be responsible for the material contained within and will still be required to submit your Blackboard quizzes on time. Attendance on dates in which you are scheduled to present is only excusable in situations described below under Grading Policies.

Grading Policies:

Point Value:

The point value is as follows:

Lecture Exams – 40% (highest two of the three exams)

Final Exam – 20%

In-Class Group Quizzes – 20%

Presentation – 10%

Writing Assignment – 10%

Grading Scale:

A = 93% - 100%

A- = 90% - 92%

B+ = 87% - 89%

B = 83% - 86%

B- = 80% - 82%

C+ = 77% - 79%

C = 73% - 76%

C- = 70% - 72%

D+ = 67% - 69%

D = 63% - 66%

D- = 60%-62%

F = 0 – 59%

Missed Assignment Policy:

Under certain circumstances students who miss assignments can be excused.

Legitimate reasons to be excused from missed assignments are: illness, death in the family, conflict with another officially scheduled university exam, official university travel, religious observance, or requirement to appear in court

In the case of an emergency, contact me as soon as possible **in writing** to inform me that you will miss an assessment. I will only accept notice of a missed assignment due to emergency within 24 hours of the scheduled time.

Acceptable documentation includes (but is not limited to): A doctor's note, a letter from a relevant campus official explaining your university-sanctioned travel, the syllabus of a conflicting class along with the contact information of that course's professor, a police report describing a car accident.

As one of the three exams on lecture content can be dropped, there will be **no make-up exams offered**.

All decisions regarding excused absences will ultimately be at my discretion.

Writing Assignment Submission:

Writing assignments will have 10% deducted for each day it is late. If handed in more than 5 days late, it will receive no credit.

If you have extenuating circumstances as described above under Make-up Request Procedure, then an extension will be provided.

Additional Information:

You will receive your writing assignment grades back within two weeks of their submission. Final grades will be available within 48 hours of the final exam.

Academic Integrity Policy:

The SUNY Old Westbury policy on Academic Integrity can be found at:

http://www.oldwestbury.edu/sites/default/files/documents/academic_integrity_0.pdf

In brief:

Plagiarism and cheating are condemned at all institutions of higher learning. These acts detract from the student's intellectual and personal growth by undermining the processes of studying, reading, note-taking and struggling with one's own expression of ideas and information. Moreover, cheating inevitably involves secrecy and exploitation of others. See "Academic Integrity" and related topics in the *Old Westbury Catalog, 2006-2008*, p.46.

Plagiarizing means "presenting somebody else's words or ideas without acknowledging where those words and ideas come from" (Ann Raimés, *Keys for Writers*, 5th ed., p.188). Examples include:

- copying material from the Internet or other sources and presenting it as your own
- using any author's words without quotation marks; using any quotation without credit
- changing any author's words slightly and presenting them as your own
- using ideas from any published sources (even in your own words) without exact credit. **Note:** This includes all material from the Internet or electronic databases.
- using long passages in a paper that have been written or rewritten by a friend or tutor
- turning in any assignment written by someone else

However, using quotations or borrowed ideas while giving exact credit is good academic procedure.

Other types of academic dishonesty include unauthorized collaboration or copying of students' work (cheating); falsifying grades or evaluations; and others. They are treated as equivalent to plagiarism.

When detected and verified, plagiarism and other academic dishonesty will be punished severely. Normally, **the first offense will result in a failure on the specific assignment; a second offense or a particularly flagrant first offense will result in failing the course.** A second verified instance of plagiarism within the School of Arts and Sciences, after report of a first verified instance, will normally result in failing the course in which the second instance occurs. Know what plagiarism is and how to avoid it; for guidance see Raimes or any other college writing handbook. **Please note: in this matter, ignorance is never an acceptable excuse.**

Accommodations for students with special needs:

If you have or suspect you may have a physical, psychological, medical or learning disability that may impact your course work, please contact:

Stacey DeFelice, Director, The Office of Services for Students with Disabilities (OSSD)

NAB 2065

Phone: 516-628-5666

Fax (516) 876-3005

TTD (516) 876-3083

E-mail: defelices@oldwestbury.edu

The office will help you determine if you qualify for accommodations and assist you with the process of accessing them. All support services are free and all contacts with the OSSD are strictly confidential. SUNY/Old Westbury is committed to assuring that all students have equal access to all learning activities and to social activities on campus.

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