

Moravian College Department
of Biological Sciences Neuroscience -
BIO 263



Fall 2014

Instructor: Dr. Cecilia M. Fox
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Office: Collier Hall of Science, Room 311B
Office Hours: Wednesdays 12-2pm, Thursdays 1-3pm
and by appointment
Lecture: Mondays, Wednesday and Fridays 10:20am-11:10am
Collier Hall of Science, Room 303
Lab: Thursdays 8:30am-11:30am
Collier Hall of Science, Room 303
Required Textbooks: Neuroscience: Exploring the Brain – 3rd edition
By Mark F. Bear, Barry W. Connors and Michael A. Paradiso
Lippincott Williams and Wilkins
Musicophilia: Tales of Music and the Brain
By Oliver Sacks
Vintage Publishers

Course Description: The study of neuroanatomy, neurophysiology and neuropathology; special emphasis on the functional aspect of brain organization; introduction to theories and research advances in the field of neuroscience will be presented through journal club and “Neuroscience in the News” activities. Laboratory includes gross anatomy and microscopic study of the central nervous system, computer assisted neurophysiology experimentation, computerized and radiographic study of the brain and a semester long behavior project.

Course Objectives: Upon completion of this course the student will be able to:

- 1) identify and discuss neuroanatomical structures and their related functions
- 2) appreciate the interrelationships among neurological structures
- 3) understand the various means through which neural transmission of information is achieved
- 4) realize the interrelationships among the central nervous system, peripheral nervous system and musculoskeletal system
- 5) become familiar with various imaging techniques in studying and identifying structures of the central and peripheral nervous systems
- 6) effectively discuss current advances in scientific research regarding various areas in neuroscience through journal club, book club and “Neuroscience in the news” activities

- 7) understand and discuss the symptoms, pathology, current therapies and research regarding neurodegenerative diseases such as Parkinson's disease, Alzheimer's disease, ALS, etc.

Grading: The grading system is as follows: (+/- will be administered as the professor deems appropriate)

A = 90 - 100

B = 80 - 89

C = 70 - 79

D = 60 - 69

Course Requirements: The student's grade will be based on the following:

Three written lecture exams	100 points each
Two laboratory exams	100 points each
Journal club presentation and participation	100 points
"Neuroscience in the News" presentation and participation	100 points
Neurotransmitter presentation	100 points
Behavior experiment	200 points
Brain Awareness Service Learning Assignment	100 points
Semi-comprehensive final exam	<u>200 points</u>
	1300 points

** Both lecture material and reading assignments are fair game for lecture exams.

** The final lecture exam is cumulative.

** The "presentation / participation grade" is based on your participation during the journal club and "news" discussions, preparation for discussion and quality of presentation.

** Presentations, assignments and behavior experiment will be discussed once the course is in progress.

Expectations and Policy:

- Attendance: Regular lecture and lab attendance is expected. No make-up exams will be given unless you have an acceptable reason (family emergency, illness, etc). If an emergency should arise, you must notify me prior to the exam and not after. If you plan to miss lab please notify me in advance.
- Cheating: will not be tolerated. Students will be held to the highest standards as specified by the Moravian College Honor Code. Violations of this code will be handled in the most severe manner allowed by university policy.
- Reading Assignments: should be completed prior to lecture as well as lab.
- Neuroscience in the News: Each student will present some new information in the field of Neuroscience that has been mentioned in the news recently. A schedule of presentations will be posted on Blackboard once the semester begins. Presentations will be on Fridays.
- Extra Help: If difficulties interpreting lecture or lab material arise, please contact me regarding tutoring sessions. *I will be more than happy to help!!*
- Cell Phone/Technology Policy: Please see attachment following course schedule.

Students who wish to request accommodations in this class for a disability should contact the staff of the Academic Support Center at 1307 Main Street, or by calling 610-861-1401. Accommodations cannot be provided until authorization is received from the Academic Support Center.

I look forward to introducing the field of Neuroscience to you. Best wishes for a great semester!

Lecture Schedule

<u>Week of:</u>	<u>Topic</u>	<u>Reading Assignment</u>
Aug. 25	Introduction to Neuroscience	Chapter 1
Sept. 1	Neurons and Glia	Chapter 2
Sept. 8	Resting Membrane and Action Potentials	Chapters 3, 4
Sept. 15/22	Synaptic Transmission and Neurotransmitter Systems	Chapters 5, 6
Sept. 29	Exam 1 (Introduction through Neurotransmitter Systems)	
Sept. 29/Oct. 6	Structure of the Nervous System	Chapter 7
Oct. 11-14	Fall Break	
Oct. 13/20	Cranial Nerves and Chemical Senses	Chapter 8
Oct. 27	Somatic Sensory System	Chapter 12
Oct. 31	Exam 2 (Structure of NS through Chemical Senses)	
Nov. 3	Spinal Control of Movement	Chapter 13
Nov. 10	Rhythms of the Brain	Chapter 19
Nov. 17-20	No Class - Society for Neuroscience Conference	
Nov. 21	Exam 3 (Central Nervous System Lesions)	
Nov. 24	Sex and the Brain	Readings provided in class
Nov. 26-30	Thanksgiving Holiday	
Dec. 1	Musicophilia and Special Topics in Neuroscience	Oliver Sacks text
Dec. 8	Final Exam at 8:30am (Topics TBD)	

Laboratory Schedule

<u>Lab</u>	<u>Topic</u>
Aug. 28	Microscopic Study of the Nervous System
Sept. 4	Primary Literature Instruction Session Selection of Journal Club Articles <i>Meet outside Reeves Library at 9:00am</i>
Sept. 11	Fall Convocation – <i>meet in Collier 303 at 10:00am</i>
Sept. 18	Behavior Experiment - Positive Reinforcement Meet in Collier 303 followed by Animal Facility
Sept. 25	Gross Anatomy of the Brain, Spinal Cord and Skull
Oct. 2	Exam 1
Oct. 9	BAW Service Learning Presentations
Oct. 16	Cranial Nerve and Special Senses Testing
Oct. 23	Somatosensory and Reflex Testing <u>Journal Club Presentation: Groups 1 and 2</u>
Oct. 30	Central Nervous System Lesions PS <u>Journal Club Presentation: Groups 3 and 4</u>
Nov. 6	Biopac: EEG <u>Journal Club Presentation: Groups 5 and 6</u>
Nov. 13	Exam 2
Nov. 20	No Lab – Society for Neuroscience Conference
Nov. 27	No Lab – Thanksgiving Holiday
Dec. 4	Behavior Experiment Presentations

Professor reserves the right to amend this syllabus as the course progresses

Technology and the Downside of Multitasking

Recently, the abundance of cell phones, iPads, laptops and other devices has produced something known as the "problem of divided attention". Articles in the New York Times, Harvard Mental Health Letter and Scientific American Mind all summarize several studies of productivity in business and medical settings. Researchers found that after responding to email or text messages, it took people more than 15 minutes to re-focus on the "serious mental tasks" they had been performing before the interruption and in some cases, this initial mental task was completely forgotten. Other research has shown that when people attempt to perform two tasks at once (e.g., following what's happening in class while checking text messages), the brain simply cannot perform these tasks equally. The brain must abandon one of the tasks to effectively accomplish the other. So, multi-tasking is not an efficient or productive way to learn or retain information.

Overall, the human brain works best when focusing on a single thread of related thoughts. By being fully engaged with the pursuit, you may experience a number of positive effects, such as more pleasure, faster learning or greater productivity. Perhaps even all three!

For this reason alone you should avoid the problem of divided attention when you are in this class. However, there is another, equally important reason to only use technology in an appropriate manner during our academic time together. As technology-users, we often lose our senses when it comes to customs of polite behavior, and the result is that perfectly charming people may become incredibly rude.

So, for both these reasons, please turn off your cellphones or set them on silent/vibrate mode when you come to class. It is disrespectful for our activities to be interrupted by a ringing cellphone. Similarly, text messaging will not be tolerated in class. Any student found to be sending or checking text messages during class will be invited to make a choice either to cease the texting or leave the classroom.

Of course, you are welcome to bring your laptop and iPad to class and use them to take notes, access readings and slideshows, etc. You are not welcome to do social networking, check email, or otherwise perform non-class-related activities during our academic time together.

So, this is my best advice: If you are not using it to perform a task specifically related to what we are doing in class at that very moment, please put it away.

Thanks to Dr. C.A Finnegan, University of Illinois at Urbana-Champaign and Dr. M.C. Miller, Harvard Medical School

