

Moravian College
Department of Biological Sciences
Neuroscience - BIO 362



Fall 2013

Instructor: Dr. Cecilia M. Fox
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Office: Collier Hall of Science, Room 311B
Office Hours: Wednesdays 12-3pm, Thursdays 1-3pm
and by appointment
Lecture: Mondays, Wednesday and Fridays 10:20am-11:10am
PPHAC 103 and CHoS 303
Lab: Thursdays 8:30am-11:30am
Collier Hall of Science, Room 303
Required Textbook: Neuroscience: Exploring the Brain – 3rd edition
By Mark F. Bear, Barry W. Connors and Michael A. Paradiso
Lippincott Williams and Wilkins
Clickers: Available in the Bookstore

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 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 and ALS

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 Phones/Pagers: Please turn off (or set on vibrate/quiet mode) your cell phones and pagers prior to entering the lecture hall and laboratory. **As a courtesy to the professor, no text messaging during lecture and lab!**

Students who wish to request accommodations in this class for a disability should contact learning services for academic and disability support at 1307 Main Street, or by calling 610-861-1510. 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. 26	Introduction to Neuroscience	Chapter 1
Sept. 2	No Class - Labor Day	
Sept. 2	Neurons and Glia	Chapter 2
Sept. 9	Resting Membrane and Action Potentials	Chapters 3, 4
Sept. 11	IN FOCUS Lecture: <i>Building Better Brains: How Neuroscience is Altering Human Functioning</i> – 6pm Foy Hall South Campus	
Sept. 12	Fall Convocation	
Sept. 16/23	Synaptic Transmission and Neurotransmitter Systems	Chapters 5, 6
Sept. 27	Exam 1 (Introduction through Neurotransmitter Systems)	
Sept. 30/Oct. 7	Structure of the Nervous System	Chapter 7
Oct. 12-15	Fall Break	
Oct. 14/21	Cranial Nerves and Chemical Senses	Chapter 8
Oct. 28	Somatic Sensory System	Chapter 12
Nov.1	Exam 2 (Structure of NS through Chemical Senses) Spinal Control of Movement Central Nervous System Lesions	Chapter 13
Nov. 4	Rhythms of the Brain	Chapter 19
Nov. 11-14	No Class - Society for Neuroscience Conference	
Nov. 11	Review for Exam 3	
Nov. 18	Exam 3 (Central Nervous System Lesions)	
Nov. 18	Sex and the Brain Brain Mechanisms of Emotion	Readings provided in class

Nov. 25-Dec. 1	Thanksgiving Holiday	
Dec. 2	The Aging Brain Special Topics in Neuroscience	Readings provided in class
Dec. 10	Final Exam at 1:30pm (Topics TBD)	

Laboratory Schedule

<u>Lab</u>	<u>Topic</u>
Aug. 29	Primary Literature Instruction Session Selection of Journal Club Articles
Sept. 5	Microscopic Study of the Nervous System Physio Ex. Neurophysiology of Nerve Impulses
Sept. 12	Fall Convocation – <i>meet in Collier 303 at 9:15am</i>
Sept. 19	Behavior Experiment - Positive Reinforcement Meet in Collier 303 followed by Animal Facility
Sept. 26	Gross Anatomy of the Brain, Spinal Cord and Skull
Oct. 3	Exam 1
Oct. 10	Cranial Nerve and Special Senses Testing
Oct. 17	BAW Service Learning Presentations
Oct. 24	Somatosensory and Reflex Testing Biopac – Reaction Time <u>Journal Club Presentation: Group 1</u>
Oct. 31	Central Nervous System Lesions PS <u>Journal Club Presentation: Group 2</u>
Nov. 7	Biopac: EEG <u>Journal Club Presentation: Group 3</u>
Nov. 14	No Lab – Society for Neuroscience Conference
Nov. 21	Exam 2
Nov. 28	No Lab – Thanksgiving Holiday
Dec. 5	Behavior Experiment Presentations

Annual Graduate Symposium - September 11, 2013

This year's Keynote speaker, Paul Root Wolpe, PhD, is a dynamic, engaging speaker and Professor of Bioethics and Director of the Center for Ethics at Emory University. One of the founders of the field of neuroethics and, Dr. Wolpe also serves as the first Senior Bioethicist for the National Aeronautics and Space Administration (NASA), where he is responsible for formulating policy on bioethical issues and safeguarding research subjects.

Dr. Wolpe's lecture, entitled "*Building Better Brains: How Neuroscience is Altering Human Functioning*" begins the College's year of thematic programming, *IN FOCUS: HEALTH CARE*. Dr. Wolpe will introduce cutting edge technologies, such as implantable brain chips, neural tissue transplants, brain-computer interfaces, and psychopharmaceutical strategies with an exploration of their profound impact on human functioning.

The evening will begin with a reception at 5:00, with the program to follow at 6:00-7:00 p.m. in Foy Hall on Moravian College's South Campus in Bethlehem.

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