

Moravian College
Departments of Biological Sciences and Psychology
Introduction to Neuroscience Methodology - NEUR 367
Fall 2013

Instructors:	Dr. Cecilia M. Fox	Dr. Sarah Johnson
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Office Hours:	W 12-3pm, R 1-3pm and by appt.	M & W 1-3pm and by appt.
Class Meeting:	Fridays 12:00pm-3:00pm Collier 302, Collier 309, Animal Facility and PPHAC 103 – <i>depending on the class (see class schedule)</i>	
Prerequisites:	BIO 362, PSYCH 211 and 212 or permission of the instructor	
Required Readings:	Selected primary and secondary scientific literature sources	

Course Description: This course will provide students with the background to understand the various experimental methods used in the discipline of neuroscience. Laboratory experiences and journal club discussions of primary scientific literature will be used to develop skills in preparation for future neuroscience research endeavors. Students will apply the fundamental techniques learned in this course to design their own research projects.

Course Objectives: The objectives of this course are the following:

- a) To introduce students to the range of experimental methods used in the field of neuroscience
- b) To strengthen skills used in reading, analyzing data and forming conclusions from scientific literature
- c) To develop research skills using a hands-on approach in a laboratory setting
- d) To investigate neuroscience from the anatomical, behavioral, molecular, cognitive and biochemical perspectives
- e) To apply the experimental methods learned in designing a research project
- f) To discuss important ethical implications associated with neuroscience research
- g) To provide an awareness of appropriate procedures and potential implications for the use of animals and humans in neuroscience research

Grading: The grading system is as follows: (+/- will be administered as the instructor 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:

Laboratory Quizzes	Top 10 quizzes (25 points each) =	250 points
Laboratory Participation		100 points
Journal Club Presentation		100 points
Journal Club Participation		100 points
Final Research Project Proposal		200 points
Final Research Project Presentation		<u>100 points</u>
		850 points

Please note: It is within the instructor's purview to apply qualitative judgment in determining grades for an assignment or the entire course.

Expectations:

- a) Attendance: Regular attendance is expected. **No** make-up quizzes will be given unless you have an acceptable reason (family emergency, illness, etc). If an emergency should arise, you must notify the instructor prior to the quiz and **not** after. If you plan to miss a laboratory experience please notify the instructor in advance. Students are allowed a maximum of one absence within this semester. If you miss class more than once, 50 points will be deducted from your laboratory participation grade. Another 10 points will be deducted from your laboratory participation grade for each additional absence. Please be aware that absences are not divided into excused and unexcused. Regardless of the reason, an absence from class is counted as an absence.
- b) Cheating and Plagiarism: 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 college policy.
- c) Reading Assignments: should be completed **prior** to every journal club discussion and laboratory experience.
- d) Laboratory Quizzes: for a particular unit will be administered the week following the relevant readings/laboratory experience (unless a different time is noted) to ensure key concepts have been understood.
- e) Laboratory Participation: You are expected to come prepared to the assigned laboratory experience. The requirements will vary depending upon the nature of the laboratory as well as the instructor for that particular laboratory experience.
- f) Journal Club Presentation and Participation: Each student will have the opportunity to lead a journal club discussion. **All students should come prepared to these presentations by having completed the assigned readings.**
- g) Final Research Project Proposal and Presentation: The details of this proposal will be distributed as the course progresses. ***This assignment will serve as the final exam for the course.*** It is expected that each student will design a research project that will apply existing techniques to new questions and we also encourage students to think creatively about innovative approaches.

Students who wish to request accommodations in this class for a disability should contact Elaine Mara, assistant director of 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.

Class Schedule

<u>Date:</u>	<u>Topic</u>	<u>Primary Instructor & Location</u>
Aug. 30	Introduction and Expectations Selection of Journal Club Presentation Dates Primary literature exercise Database Review – <i>Reeves Library at 1pm</i>	Fox/Johnson PPHAC 103
<i>Neuroanatomy</i>		
Sept. 6	Comparative Neuroanatomy: Systems Approach to Brain Dissection <i>Dissection Paper (Will serve as Quiz 1)</i>	Fox Collier 302
Sept. 11	IN FOCUS Lecture: <i>Building Better Brains: How Neuroscience is Altering Human Functioning – 6pm Foy Hall South Campus</i>	
Sept. 13	Care and Use of Animals in Laboratory Research Preparation of Research Animals for Surgical Lab Journal Club 1	Fox PPHAC 103 Animal Facility
Sept. 20	Stereotaxic Surgery <i>(Surgery times during the week TBD)</i> <i>Quiz 2</i>	Fox Collier 309
Sept. 27	Lesion (Animal & Human Studies) <i>Quiz 3</i>	Johnson PPHAC 103
Oct. 4	Neurotransmitters and Histology <i>Quiz 4</i>	Fox Collier 302
<i>Behavior and Cognition</i>		
Oct. 11	Psychology Research Methods & Electrophysiology Techniques Journal Club 2 <i>Quiz 5</i>	Johnson PPHAC 103
Oct. 18	Neuroimaging Techniques Journal Club 3 <i>Quiz 6</i>	Johnson PPHAC 103

Oct. 25	Neuroimaging: Ethics and Concerns <i>Quiz 7</i>	Johnson PPHAC 103
Nov. 1	Ethics in Animal and Human Research Journal Club 4 <i>Quiz 8</i>	Fox PPHAC 103
Nov. 8	Animal Behavior <i>Quiz 9</i>	Zaremba/Fox Animal Facility
Nov. 15	Stereology Journal Club 5 <i>Quiz 10</i>	Fox PPHAC 103 Collier 302
Nov. 22	Final Research Proposal and Presentation <i>Quiz 11</i>	Fox/Johnson PPHAC 103
Nov. 29	<i>Thanksgiving Holiday</i>	
Dec. 6	Final Research Proposal and Presentation	Fox/ Johnson PPHAC 103

Due to the experimental and hands-on nature of this course, the professors reserve the right to amend this syllabus as the course progresses.

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.