

PSY 413W: Laboratory in Behavioral Neuroscience (FS19)

227 Giltner Hall; Tue/Thur 12:40-3:30 pm

The objectives of this laboratory course are to provide students with a basic understanding of some of the principles and techniques used in Behavioral Neuroscience research. Discussions, demonstrations, and hands-on experimentation will provide a fundamental appreciation of this field. You will also learn how to present and interpret your results in the context of an existing scientific literature by writing papers in a format appropriate for this field. To take this course, you already should have fulfilled your Tier I writing requirement, taken and passed either ZOL 402 (Introduction to Neurobiology) or PSY 209 (Brain and Behavior), as well as successfully completed PSY 295 (Data Analysis in Psych Research/Statistics).

Instructor: Prof. Lily Yan; 218 Giltner Hall; yanl@msu.edu. Office hours: Tuesdays, 9:30 - 10:30 am.

Teaching Assistant: Ben Fry, M.A.; 309 Giltner Hall; email: frybenj1@msu.edu. Office hours: Mondays 2:00pm -3:00 pm.

Class Hours: Class will be held on Tuesdays and Thursdays from 12:40-3:30pm in Giltner Hall room 227. Please be prepared to occasionally come a little earlier or stay later than the scheduled class time, which we will more than make up to you by ending class early on other days during the semester. We will try our best to tell you at least two days in advance if we might need to start earlier than 12:40 or stay later than 3:30 on any particular day.

Course Requirements and Expectations: Students are expected to be interested and involved in what we do in the lab, including attending class and participating in all discussions and experiments; grades will be strongly influenced by your perceived interest and involvement. In addition, students will be responsible for knowing the material covered in class and in the required readings. For the initial exercise dissecting the sheep brain, there is a lab guide that students are expected to read. For the remaining exercises, students are expected to read any scientific articles or book chapters that the instructors provide as background. Information covered in class and in the selected readings will provide background information for the four laboratory write-ups. Because almost all class meetings involve hands-on activities, sometimes requiring work in small groups, it is not possible to make up a missed lab day. Each student will be allowed one medical, religious, or legal excused absence if documentation of the excuse can be provided to the instructor within one week of the missed day.

Academic Honesty and Integrity: MSU has strict guidelines regarding academic honesty and integrity. These rules will be followed in this course and no student is exempt for any reason. Please refer to your Student Handbook to see details of these guidelines. Academic Honesty Article 2.3.3 of the Academic Freedom Report states, "The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards." In addition, the Psychology Department adheres to the policies on academic honesty specified in General Student Regulation 1.0 - Protection of Scholarship and Grades, the all University Policy on Integrity of Scholarship and Grades (<http://splife.studentlife.msu.edu/regulations/general-student-regulations>). Therefore, unless authorized by the instructors, you are expected to complete all course assignments without assistance from any source. You are not authorized to use the Koofers.com web site or similar sites to complete any work in this course. Students who violate MSU rules will receive a penalty, including but not limited to a failing grade on the assignment or in the course. If you have any questions or concerns about whether any particular activity is permitted while you carry out the work for this course you are urged to see the web site of the University Ombudsman at www.msu.edu/unit/ombud, especially the section on Academic Honesty. The ombudsman has some very specific information about the kinds of activities that are or are not appropriate. Also, please do not hesitate to discuss concerns or questions about these issues with us.

Required Materials: A short, paperback book is required, “Atlas of the Sheep Brain” by Northcutt, Williams, and Barber (1966). You will also need a set of laboratory dissecting tools, and a 3-ring notebook for taking notes and filing protocols and readings we provide throughout the semester. All of these can be purchased from the Student Bookstore. All other course materials will be distributed in class.

Grading: Course grades will be based on the following:

Total points = **500**

1) Sheep brain practical exam: 10% total grade, **50 points**

2) Read 5 articles and complete the assigned writings: 10% total grade, **50 points**

3) Experiment write-ups:

Experiment I - Visualizing Neurons - 10% total grade or 50 points:

Title page = 5 points

Methods = 25 points

Results = 20 points

Experiment II - Biological Basis of Depression - 15% total grade or 75 points:

Title page = 5 points

Abstract = 10 points,

Introduction = 30 points,

Methods = 25 points,

Results = 30 points

Experiment III - Object recognition memory - 20% total grade or 100 points:

Title page = 5 points

Abstract = 10 points

Introduction = 30 points

Methods = 10 points

Results = 20 points

Discussion = 25 points

Experiment IV - Photic effects on neural activity - 25% total or 125 points:

Title page = 5 points

Abstract = 10 points

Introduction = 30 points

Methods = 20 points

Results = 20 points

Discussion = 40 points

5) Attendance and participation in class: 10% total grade or **50 points:**

Attendance/Participation 2 points/day = 50 points

6) Grading Scale (% points out of 500 total):

>90% = 4.0

85-89% = 3.5

80-84% = 3.0

75-79% = 2.5

70-74% = 2.0

65-69% = 1.5

60-64% = 1.0

<60% = 0.0

Accommodations for Disabilities: Michigan State University is committed to providing equal opportunity for participation in all programs, services and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities at 517-884-RCPD or on the web at rcpd.msu.edu. Once your eligibility for an accommodation has been determined, you will be issued a Verified Individual Services Accommodation ("VISA") form. Please present this form to me at the start of the term and/or two weeks prior to the accommodation date (test, project, etc.). Requests received after this date may not be honored. If you require testing accommodations (additional time, less disruptive room, etc.) you must contact the instructor or the TA and present your VISA *at least two weeks before the exam date* to schedule an alternative exam.

Class Schedule

Date	Topic/Task
8/29 (Thur)	<u>General Introduction</u>
9/3 (Tue)	Dissection and anatomy of sheep brain
9/5 (Thur)	“
9/10(Tue)	“
9/12 (Thur)	Sheep Brain Practical Exam
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9/17 (Tue)	<u>Experiment #1 Introduction</u> - Histology & Immunocytochemistry (ICC); Introduction to APA writing style (distribute assigned reading #1)
9/19 (Thur)	Freezing microtome; Sectioning rat brains (3 alternate sets)
9/24 (Tue)	Mount 1 set of sections for Cresyl-Violet staining, start ICC on another set.
9/26 (Thur)	Cresyl-violet staining/cover slip; 2 nd day ICC (2 nd antibody, ABC)
10/1 (Tue)	DAB reaction; mount (coverslip by TA)
10/3 (Thur)	Microscope analysis of ICC and Cresyl-violet staining. Discuss lab report #1
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10/8(Tue)	<u>Experiment #2 Introduction</u> – Biological basis of depression and anxiety, continue microscope analysis of expt. 1 (distribute assigned reading #2)
10/10 (Thur)	Assess anxiety-like behavior using open field test; Lab #1 write-up due
10/15 (Tue)	Assess depression-like behavior using tail-suspension test (TST)
10/17 (Thur)	Compile and analyze behavioral data.
10/22 (Tue)	Society for Neuroscience Annual Meeting, Class cancelled
10/24 (Thur)	Review lab report #1, discuss lab report #2 (distribute assigned reading #3, 4)
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10/29 (Tue)	<u>Experiment #3 Introduction</u> – Learning and memory
10/31 (Thur)	Test object recognition memory Lab #2 write-up due
11/5 (Tue)	Compile behavioral data, analyze statistically. Discuss lab report #3
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11/7 (Thur)	<u>Experiment #4 Introduction</u> – Circadian rhythms and sleep; Transcardial perfusion, review lab report #2 (distribute assigned reading #5)
11/12 (Tue)	Transcardial perfusion (mice)
11/14(Thur)	Section mouse brains, Lab #3 write-up due
11/19 (Tue)	Processing brain tissue (ICC) - day1
11/21 (Thur)	Processing brain tissue (ICC) - day2
11/26 (Tue)	DAB reaction, mount sections and coverslip, review lab report #3
11/28 (Thur)	Holiday - University closed
12/3 (Tue)	Microscope analysis of sections; compile data across groups.
12/5 (Thur)	Discuss lab report #4
12/12 (Thur of finals week)	Lab #4 write-up due (12:45-2:45pm)