

LABORATORY IN PSYCHOBIOLOGY
PSY U606 Course outline

Course Number: PSY U606	Instructor: Professor Jay McLaughlin	TA: Amanda Carey
Key Number: 04473	Office: 114 Lake Hall	Office: 113 Lake Hall
Semester Offered: Spring 2008	Phone: (617) 373-2361	Phone: (617) 373-7983
Total Credit Hours: 4 credits	E-mail: j.mclaughlin@neu.edu	E-mail: carey.a@neu.edu

Office Hours: Tuesday, Wednesday and Thursday, 9:00 – 10:00 a.m., or by appointment

Class meets: Mondays from 8 – 10:20 a.m. in **274 Nightingale Hall**

Lab sections held Wednesdays and Thursdays from 8 – 10:20 a.m. in **118 Lake Hall**

COURSE GOALS:

- Understanding and application of biological experimental methods to psychological questions
- Skills preparation for future psychobiology research career, including basic methods in molecular biology (primer design, PCR, gel electrophoresis), pharmacology (receptor binding) and animal behavior (learning and memory; stress-related behaviors; conditioned place preference and automated data collection systems)
- Development of critical reading, analytical and discussion skills

COURSE STRUCTURE:

Class will be divided weekly into lectures on Mondays, followed by lab work in sections on either Wednesday or Thursday. Students **must** sign up for and attend one lab section a week.

Lectures will be given in the first 60-90 minutes of each Monday class. These are intended to provide the background necessary to understand and analyze the following week's experiments. Additional time will be spent each lecture summarizing the results of the previous week's work, and guiding students through analysis and discussion of results.

Laboratory research, and the weekly preparation of results, will comprise the majority of time spent in this course. Experiments are divided into three modules. Each week following the lecture, students will perform the designated experiments in the lab. Please note that students are responsible for all reading material assigned each week **before they come to lab. Attendance in the laboratory during your section is mandatory.** Note that participation and reporting of results from the lab counts significantly towards the final grade.

TEXTS:

None required. Materials used to develop the PowerPoint lectures for this course come from various texts and manuscripts. Weekly reading of protocols and the occasional primary literature article will be assigned (see below). Please note that lecture notes, assigned articles and protocol sheets will be the source of material for all exams.

PowerPoint presentations, lab protocols and research articles covered in class will be made available online through Blackboard. Copies will also be available in the Psychology Main Office (125 Nightingale Hall) for photocopying.

If further references for basic principles are desired, I recommend Biological Psychology, 8th edition. JW Kalat, Wadsworth Publishing, Belmont, CA (2004). This may be of assistance to you, but IS NOT REQUIRED. You can find it at Amazon.com or through the Northeastern University library. Kalat provides excellent background, but with much more material than needed for this course.

GRADING EVALUATION:

Final course grades will be computed using the following point system:

108 pts. Weekly lab reports, covering the nine experiments performed in the course.

20 pts. On-line safety testing. Chemical hygiene and radiation safety exams must be passed!

72 pts. Three exams. Students will be tested with noncumulative midterms and final.

Additionally, a student can earn an extra credit point each class by posing relevant questions.

All students are encouraged strongly to participate on a regular basis.

To be clear: **every week, each of you** will be performing assigned experiments and submitting a lab report. Keeping up with the assigned experiments and attending each week is therefore critical to passing this class! **Each week's lab report is worth 12 pts; each online safety exam 10 points, and each exam is worth 24 points.**

Scoring of your submitted writings are based on covering the following points in the assigned material:

Weekly lab reports:

- Purpose/hypothesis; introduction where appropriate. No more than 300 words long!
- Materials and methods. This is the procedural protocol, with notes on any deviations
- Experimental data, fully detailed
- Discussion and Conclusions, with analysis. No more than 500 words long!
- References, if any.

STANDARD RULES AND PROCEDURES:

Students are expected to attend each class and lab section. In case of illness or scheduling conflicts resulting in a missed lecture, students are responsible for obtaining lecture materials from other students. With advance permission, students may complete assignments outside their typical section. However, due to the nature of these experiments, students must complete assigned labs in the week assigned; **make ups will not be possible.**

Students are to demonstrate respectful, professional behavior. Users of cell phones, pagers and PDAs are asked to minimize disruptions by stepping outside of the classroom. If you have a special circumstance in this regard, please see me. Likewise, if you have specific disabilities that you believe may require accommodations for this course, please meet with me at your earliest convenience to discuss appropriate measures to assist you. The Disability Resource Center on campus (20 Dodge Hall, x2675) may also help. Bear in mind that the University requires that you provide documentation of your disability to the DRC.

The research sections of this course will be taught in a working laboratory. By their nature, laboratories can be a hazardous place to work. **Safety protocols given the class will be strictly enforced.** In particular, please note the dress code (no open shoes; protective covering) must be maintained for your own protection.

There are five key concepts that will help you succeed in this course:

1. Attend class and lab! Everything you need to know will be presented there.
2. Ask questions! Note that I give points for this, so clearly I **want** questions.
3. Be prepared for lab. If you keep up with the work, I promise this will not be a problem for you.
4. Form study groups. Much of this material makes more sense when approached in a team.
5. Ask for help. I am always available for a student in need.

LABORATORY IN PSYCHOBIOLOGY- PSY U606- SYLLABUS SPRING 2008:

JANUARY:

7 No class

MODULE 1: Molecular biology

- 9 Introduction. Lecture: Course responsibilities and safety
Homework: Take on-line lab safety course and exam (due by Jan. 17th)
- 10 Lecture: **DNA; working with PubMed and BLAST**
Lab 1 (January 10): **Working with sequences and designing primers**
(January 14 and 16: Complete Lab 1)
- 17 Lecture: **Working with DNA (1): Polymerase Chain Reaction**
- 21 **NO CLASS: Martin Luther King Jr's Birthday Observed**
Lab 2 (January 23 and 24): **PCR; genotyping**
- 28 Lecture: **Analyzing DNA: Restriction enzyme digests and gel electrophoresis**
Lab 3 (January 30 and 31): **Restriction enzyme digests and gel electrophoresis**

FEBRUARY:

4 MIDTERM EXAM 1 (covers all material through Module 1)

MODULE 2: Receptor pharmacology

- 11 Lecture: **Radiation safety**
Homework: Take on-line radiation safety exam (due by Feb. 20th)
- 18 **NO CLASS: President's Day Observed**
- 20 Lecture: **Statistics review; using Excel**
Lab 4 (February 20 ONLY): **Excel; Normal distributions and statistical analysis**
NOTE: Class meets in ? Hall for this lecture/lab!!!
- 25 Lecture: **Opioid pharmacology and receptor binding assay**
Lab 5 (February 27 and 28): **Opioid receptor binding assay**

MARCH:

- 1-9 **NO CLASS: Spring Break**
- 12 Review session
- 13 MIDTERM EXAM 2 (covers all material from Module 2)

MODULE 3: Behavioral pharmacology

- 17 Lecture: **Drug abuse; measures of reward**
Lab 6 (March 19 and 20): **Cocaine-conditioned place preference**
- 24 Lecture: **Stress and Mood disorders**
Lab 7 (March 26 and 27): **Social defeat stress, learned helplessness and anxiety**
- 31 Lecture: **Learning and memory**

APRIL:

- Lab 8 (April 2 and 3): **Effects of stress on novel object learning**
- 7 Lecture: **Extinction and reinstatement of reward**
Lab 9 (April 9 and 10): **Stress-induced reinstatement of cocaine reward**
- 16 FINAL EXAM (covers statistics and material from Module 3)