Biobehavioral Professional Seminar, Part II: Behavioral Neuroscience
(PSYC 303)
Fall 2008

Professor:
John Green
Dewey Hall 358
E-mail: john.green@uvm.edu
Office hours: By appointment

Meeting Time & Location:
Dewey Hall 100
Tuesdays (October 22 – December 10), 9:05 am-12:00 pm

Course Description
Biobehavioral Professional Seminar is designed to be an advanced survey and analysis of behavioral and biological psychology, with special emphasis on learning theory (Part I) and behavioral neuroscience (Part II). The focus of Part II of this course is on behavioral neuroscience. Behavioral neuroscience can be defined as “the study of how neural systems work together to produce behavior”. Some people use the term “behavioral neuroscience” to refer to the study of nervous system-behavior relations in non-human animals and “cognitive neuroscience” to refer to the study of nervous system-cognition-behavior relations in humans (and perhaps other primates). These are very loose distinctions and not universally agreed upon but you should be aware of them. In this part of Pro Sem, we will focus mostly on rodent work because rats and mice are the most commonly used species to study nervous system-behavior relations and because these are the two species that UVM biobehavioral psychologists use.

Course Objectives
You should leave this course with a basic understanding of research in behavioral neuroscience. We will begin by talking about neuroscience “fundamentals”. For some of you, this will be no more than a review. For others, there may be a fair amount of new information in this section. The point is to make sure that everyone has a basic level of understanding of neuroanatomy, neurophysiology, neurochemistry, and neuropharmacology before moving on. There will be 5 lectures following this lecture on the fundamentals. In these lectures, you’ll hear about three examples of behavioral paradigms (fear conditioning; eyeblink conditioning; learned helplessness) in which researchers have made tremendous progress in determining reasonably precise relations between particular neural circuits and different types of behavior. The other 2 lectures will cover general areas of interest (animal models of clinical conditions and “translational neuroscience”; interactions between environment and neural plasticity) that cut across particular behavioral paradigms. By the end of this portion of Pro Sem, everyone should have some working knowledge of some of the approaches and questions in behavioral neuroscience. While it’s impossible to give you a full overview of behavioral neuroscience in only six weeks, you should get enough of an overview to support further exploration of these topics in our Biobehavioral seminars. It is also hoped that the topics we discuss will give you “food for thought” for how behavioral neuroscience-related approaches might contribute to your own area(s) of research interest.
Course Requirements

At the end of each week’s meeting, I will pass out one or more thought questions for the next meeting. These are designed to get you thinking about the readings for that week. I’ll collect your responses to these questions and this will form 25% of your grade.

For the Nov. 19 class on Translational Neuroscience, find an empirical paper from the recent literature (last 5 years or so) that you would consider “translational”. Choose something not related to post-traumatic stress disorder (PTSD) or attention-deficit/hyperactivity disorder (ADHD) since those are topics of the two reviews we’ll read. Be prepared to discuss why you consider the topic of your chosen paper “translational”.

Due in the final class (Dec. 10) will be a 6 page paper (1” margins all around, 11 pt Arial font, single line spacing) in the form of Specific Aims (1 page) and Background & Significance (5 pages) for an NIH grant application. The focus of this paper will be on “Translational Neuroscience Research”, which will also be our topic in the class (Nov 19) before Thanksgiving break. You can let me know in class or over e-mail about your ideas for a topic. I can be flexible on the topic you choose so that you can try to relate it to your own area(s) of research interest but it must incorporate some aspect of behavioral or cognitive neuroscience (e.g., animal models, imaging) and be translational in nature (e.g., one possibility is to include an animal model and human clinical component; another possibility is to include an imaging component to elucidate mechanisms and a component to translate these findings to people in an institutional or community setting of some sort). The final paper will be worth 50% of your grade.

Grading

Thought questions – 25%
Class participation – 25%
Final paper – 50%

Course Outline

NOTE: the articles should be read in the order specified for the optimal learning experience!

Readings will be available on the Blackboard course site and by the Psych 1 office.

Oct 22 -- Introduction

meet & greet
go over syllabus and discuss goals of this portion of the course
handouts:


Oct 29 – Overview of the Basic Neuroscience: Neuroanatomy, Neurophysiology, Neurochemistry, and Neuropharmacology

(Read Chapters 4 and 6 and skim Chapter 5)

Nov 5 – Neural Circuits, Physiology and Neurochemistry of Fear and Anxiety (guest lecture: Professor William Falls)


Nov 12 – A Neural Circuit Analysis of Behavior: Pavlovian Motor Learning


Nov 19 – Translational Neuroscience and Animal Models (Part 1); NIH Grant Writing Workshop (Part 2)


Nov 26 – no class; Thanksgiving break

Dec 3 – Stressor Controllability, Learned Helplessness, and Depression (guest lecture: Professor Jom Hammack)


**Dec 10 – Enriched Environments, Exercise and Brain Plasticity**
