

# Tentative Syllabus



## **From Neurons to Consciousness, Spring 2021 Brown - Pfizer Master of Arts Program Course Number: NEUR 1500**

*This course does NOT satisfy a core requirement for the Master of Arts degree*

### **Course Goals**

The course has two goals – for students to acquire a broad knowledge of neuroscience from molecules to behavior and to understand what is known about neurological and psychiatric disorders and their treatment.

### **Course Content**

NEUR 1500 will provide an overview of the mammalian nervous system with an emphasis on the structure and function of the human brain. The course begins with the study of nerve cells: their structure, the propagation of nerve impulses and the transfer of information between neurons. These are the building blocks for all the systems and functions we will discuss. This is followed by lectures on overall brain anatomy; these will give you the big picture for how the brain is organized and which brain areas are involved in particular functions as well as different diseases and disorders. We then move to the sensory systems such as hearing, vision and touch and discuss how physical energy is converted by each system into neural signals, where these signals travel in the brain, and how they are processed. These systems are the basis for all the experiences we have. Next we study the control of voluntary movement, which is the only way we have to interact with the world. In the last portion of the course we discuss brain mechanisms involved in coordinated brain functions and behavior, including functions of the autonomic functions, motivated behaviors (e.g. eating, drinking), learning and memory, attention and consciousness, and mental illness.

### **Prerequisite**

Introductory biology or equivalent background knowledge. We assume people in the class have diverse backgrounds, so basic concepts will be introduced as we go.

### **Instructor**

The course director is Michael Paradiso, Ph.D. Dr. Paradiso is a Professor in Brown's Department of Neuroscience. He is also a member of Brown's Carney Institute for Brain Science and Director of Brown's Center for Vision Research. He can be reached at: ; [Michael.Paradiso@brown.edu](mailto:Michael.Paradiso@brown.edu). Some weeks we will also have a guest lecturer.



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## Course Format

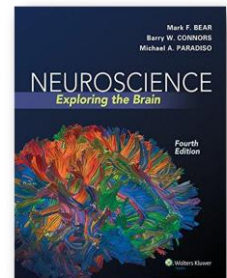
The course will be held on Tuesday afternoons 3-6pm. In addition to lectures, some class time will be used to discuss special topics and research papers. Additionally, a Teaching Assistant will run a weekly session to review material and answer questions. Finally, toward the end of the course, each student will give a presentation on a research article.

## Exams and Grades

The course grade will be based on scores from quizzes, class participation, and the student presentation.

## Readings

The textbook used in the course is *Neuroscience: Exploring the Brain, Fourth Edition* by Bear, Connors and Paradiso. Note that there are older editions of this book kicking around but we don't recommend them as the new edition has significant revisions. We will also read and discuss a number of research articles.



## Course Outline

<b>Date</b>	<b>Topic</b>
January 26	Introduction, neurons, neurological disease
February 2	Resting membrane potential and action potentials
February 9	Synapses and neurotransmitters
February 16	No class
February 23	Brain anatomy
March 2	The visual system
March 9	The auditory system
March 16	The somatosensory system
March 23	Control of movement
March 30	Chemical control of brain and behavior, motivated behaviors
April 6	Learning and memory
April 13	Mental illness
April 20	Attention and consciousness
April 27	Student presentations