

# DARTMOUTH

Department of Psychological and Brain Sciences

## Graduate Course Offerings 2022-2023

All courses are 1 credit unless otherwise noted; PBS graduate students **must** enroll in a total of at least **3 credits per term** including at least one credit of research.

### SUMMER 2022

#### **PSYC 179. Virtual Reality for Psychology and Neuroscience (Wolbers)**

Virtual reality (VR) and related technologies (Augmented / Mixed Reality) are powerful tools for understanding the human mind. This course will introduce the latest developments in virtual reality technology and its key applications for psychological and neuroscience research. We will discuss what makes VR such a powerful technology, how it is used – across species – to understand fundamental principles of neural and behavioral processing, and how the technology can improve the treatment of mental disorders.

### FALL 2022

#### **PSYC 100. Proseminar (all faculty)**

An introduction to the research program of PBS Faculty. Taken by students in their first year.

#### **PSYC 126/IND 102. Systems Neuroscience (Taube)**

#### **PSYC 165. Best Practices for Eye Tracking (Rolf)**

Students will learn about the state of the art in eye tracking in experimental psychology and gain hands-on experience in experimental control, data collection, data analysis, and interpretation.

#### **PSYC 177. Interacting Minds (Stolk)**

Insight into how human brains work in their most ubiquitous and biologically meaningful context, social interaction, has remained largely elusive. This course ventures into this “dark matter” of social neuroscience, pursuing the question of what constitutes a meeting of minds. Conceptual and methodological challenges of studying human interaction are dealt with in-class discussions, laboratories, and small group research projects on selected topics. Students will be expected to design, run, analyze, and write up an interaction study answering a question of their choosing. Example research projects include but are not limited to studies of human interactive behavior in the real world, the lab, simulated scenarios, or on social media.

**PSYC 179. Computational Models of Cognition (Soltani)**

This course will explore various computational models used for studying cognition. This includes models of attention, decision making, reward-based and reinforcement learning, and working memory. The course will focus on both descriptive and mechanistic models and how these models are used to explain behavior, interpret neural activity, and reveal underlying neural mechanisms. We will emphasize circuit-level models that can provide testable predictions for future experiments in humans and other animals. Overall, the purpose is to introduce students to a broad class of recent computational models of cognitive processes.

**PSYC 700. Grad Student Ethics Course (Soltani)**

Required course for all Cognitive Neuroscience and Psychological & Brain Sciences graduate students. Generally, consists of five two-hour sessions as well as additional reading and preparation.

**WINTER 2023****PSYC 110. Measurement and Statistics I (Wolford)**

First section of Graduate level statistics. Taken by students in their first or second year.

**PSYC 160. Imaging Methods (Chang)**

How can we understand how the brain works? This course provides an introduction to in vivo neuroimaging in humans using functional magnetic resonance imaging (fMRI). The goal of the class is to introduce: (1) how the scanner generates data, (2) how psychological states can be probed in the scanner, and (3) how this data can be processed and analyzed. Students will be expected to analyze brain imaging data using the opensource Python programming language. We will be using several packages such as numpy, matplotlib, nibabel, nilearn, fmriprep, pybids, and nlttools. We will cover the basics of signal processing, and how we can make inferences using the general linear model. We will also introduce more advanced analysis techniques such as prediction/classification, representational similarity analysis, and intersubject correlations.

**PSYC 167. Professional Development (Stoermer)****SPRING 2023****PSYC 111. Measurement and Statistics II (Wolford)**

Second term of Graduate level statistics. Typically taken by PBS students in their first or second year.

**PSYC 132. Introduction to Programming for Psychological Scientists (Manning)****PSYC 175. Current Topics in Behavioral Neuroscience (van der Meer)****PSYC 123. Social Neuroscience (Wheatley)**

## RESEARCH AND TEACHING COURSES

These courses are offered every term.

**PSYC 115. Supervised Teaching (1 credit):** Taken while performing a TA.

**PSYC 117. Specialist Requirement (1 credit):** Taken while doing specialist reading and written exam, usually not awarded a grade until completed (so 'ON' appears in the grade column until exam is completed and graded).

**PSYC 118. Research Presentation (1 credit):** Taken in the spring term of the second year while completing the second-year research presentation.

### **PSYC 168. Experiential Learning**

The goal of this course is to provide students with practical training through a full-time internship outside of Dartmouth College. This real-world, hands-on experience will expose students to diverse career opportunities during graduate school and give students a chance to engage with a field of interest, related to their doctoral research, prior to completion of their PhD.

For this course, the student will propose and arrange a paid or unpaid internship in an existing enterprise (industry, government, or other) in consultation with their Thesis Advisor (primary mentor) and the PBS Graduate Committee. This process should happen in advance of the term of enrollment. Course enrollment is concurrent with the internship and should be for a period of one term. At the end of the internship, the student will make an oral presentation to the PBS community (faculty, post-doctoral fellows, graduate students, and others who may be interested) that addresses the nature of the enterprise they were engaged in, the problem they were assigned, and the results and impact of their project. The purpose of the presentation is to share lessons learned from the internship experience with the PBS community. The presentation will be accompanied by a short but complete written report. Neither the presentation nor report should contain confidential information of the enterprise.

This course is considered a methods course, carries two credits, and can fulfill one of the elective course requirements for the PhD degree. Students may enroll in the course no more than once. Students holding F-1 sponsorship should consult with the Office of Visa and Immigration Services (OVIS). Students engaged in paid internships will not receive a graduate student stipend during the term of the internship.

Prerequisites: This course is generally open to students in their second-fourth year in the program (i.e. after completion of their first three terms and prior to proposing their dissertation). Instructor permission is required and will be granted once the PBS Graduate Committee approves of the student's internship proposal.

**PSYC 188 (1 credit), 288 (2 credits), 388 (3 credits). Graduate Research:** All active students must take at least one research credit every term.

## **HOW TO CHOOSE THE CORRECT RESEARCH COURSE**

Remember that you must be enrolled for 3 total credits per term to be considered 'active'. If you are not sure about courses, check with Julia Abraham.

If you are enrolling in full time research (i.e. not taking any seminars, teaching assistantships, or specialist reading courses), enroll in PSYC 388 (3 credits). If you are enrolling in 1 seminar course as well as conducting research, enroll in PSYC 288 (2 credits). If you are enrolling in 2 courses as well as doing research, enroll in PSYC 188 (1 credit). You should be enrolled in at least 1 credit of research every term.

*Example 1:* you are a first year student taking the proseminar and doing research: you will sign up for PSYC 100 and PSYC 288.

*Example 2:* you are TA'ing a course, taking a Special Topics Seminar, and doing research: you will sign up for PSYC 115, PSYC 179, and PSYC 188.

*Example 3:* you are taking no courses, you are not TA'ing, and you are not working on your specialist requirement; you are only participating in research for the term: you will sign up only for PSYC 388.

## **COURSES OFFERED BY OTHER DEPARTMENTS AND PROGRAMS**

If there is a course offered by another department, which you would like to take for PBS grad program credit, please contact the Chair of the Graduate Committee to request approval before taking the course.