Graduate Course Offerings 2019-2020

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

SUMMER 2019

PSYC 121. Perception (Greenlee)
This course will review recent scientific findings concerning the neural basis of perception, i.e. how our sensory organs transduce sensory information to form integrated percepts of our environment. We will present the central pathways underlying each of the sensory systems, along with a look at multisensory integration. Participants will be expected to make classroom presentations on selected topics.
Meeting time: 10A.

FALL 2019

PSYC 100. Proseminar (all faculty)
An introduction to the research program of PBS Faculty. Taken by students in their first year.

PSYC 110. Measurement and Statistics I (Wolford)
First section of Graduate level statistics. Taken by students in their second year.

PSYC 164. Computational Methods (Haxby)
This course will review current computational methods for understanding how information is coded in neural activity and how to decode patterns of neural activity to reveal the information that is being represented and processed. The course will cover topics such as multivariate pattern classification, representational similarity analysis, forward encoding models, and using hyperalignment to build common models of representational and connectivity spaces. The course will concentrate on applications to human functional neuroimaging data, but application to other methods of measuring neural activity in humans and animals will also be covered.

WINTER 2020

PSYC 111. Measurement and Statistics II (Wolford)
Second term of Graduate level statistics. Typically taken by PBS students in their second year.
PSYC 171. Brain Evolution (Granger)
For the first 200 million years of mammalian evolution, animals' brain sizes were relatively predictable from their body size via a straightforward allometric relation. In the past four million years, an evolutionary blink of the eye, primates rapidly evolved brains that are four times larger than previously would have been predicted for their body size. What are the contents of our brains? How do they differ from the brains of other mammals (and non-mammals)? How did they acquire their enormous size? Evolution acts on genes, not on organisms; what are the genetic factors that have been identified in recent primate brain growth? What mechanisms are at play, including extrinsic factors and evolutionary “pressures”? What criteria must theories of brain evolution conform to, and what data are to be accounted for? What differential predictions arise from various theories and how are they tested? What relationships obtain between anatomical and functional brain characteristics? The class will cover a set of related topics including brain structure, anthropology, evolution, genetics, development, cognition, race, and intelligence.

PEMM 115. Fundamental Neuroscience (PEMM faculty)
The PEMM 115 course provides graduate students with a rigorous exploration of fundamental neuroscience spanning from neurochemistry and molecular mechanisms, to systems neuroscience and pathological disease states. The course is designed to provide first-year neuroscience students with foundational knowledge upon which they will build as they pursue their own individualized research directions within the PEMM neuroscience theme. Specific topics covered include neural development, circuit formation and anatomy, neurophysiology and signaling, sensory and motor systems, neurogenetics, and pathology.

*PEMM 115 is a two credit course and will fulfill the requirement previously fulfilled by PSYC 126/127 for PBS students in the behavioral neuroscience research group and/or those students completing a Cognitive Neuroscience Ph.D. Tentative class schedule is MWF, 8:00-10:00am.*

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**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).

**PSYC 118. Research Presentation (1 credit):** For students who entered the program before 2015, taken while doing specialist grant proposal and defense; usually not awarded a grade.
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until completed (so ‘ON’ appears in the grade column until exam is completed). For students
who entered the program in 2015 or later, taken in the spring term of 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 one credit, 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 NUMBER OF RESEARCH COURSE CREDITS

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

The following is list of courses that have been offered in the past by other departments or programs and are already approved for PBS graduate curriculum credit. Please refer to the current ORC to find out if/when they are being offered. If there is a course other than those listed below which you would like to take for PBS grad program credit, contact the Chair of the Graduate Committee to request approval before taking the course.

PEMM 124. Ethical Conduct of Research
There will be approximately four one-and-a-half hour small group discussion sessions and four one hour lectures with the times to be arranged. Topics will include: mentoring, data collection, academic integrity, ethical use of human subjects and laboratory animals, authorship, sponsored research and intellectual property.

PEMM 131. Current Approaches in Experimental Therapeutics
This course will present a survey of current methods and approaches in pharmacologic, molecular and experimental therapeutic research. Topics will include pharmacogenomics, pharmacokinetics, functional genomics, in vivo imaging, global gene expression, proteomics, gene targeting, gene therapy and drug screening and delivery. The class will be in lecture format with student discussion and participation. The class will meet for 3 hours each week.

PEMM 211. Neurobiology of Disease
This course will introduce students to the cellular and molecular processes that are pathologically altered in a variety of neurological diseases. Students will also learn by reading and presenting seminal papers on neurological disease topics how neuroscientists research the causes and potential treatments of the disease. The course will be team taught by experts from the neuroscience faculty who will give a one hour didactic lecture in the first session of the week. Then, in a 2 hour session later in that week, students will present and critique scientific papers on the topic chosen by the faculty for that week.

PEMM 271. Advanced Biomedical Sciences
This course emphasizes the integration of molecular, cellular, and systems level information and the experimental approaches used to understand physiology and pathophysiology. It is designed to provide graduate students with a more sophisticated understanding of the major systems of an organism and how they act and interact in order for an individual to adapt and survive in the face of changing environmental resources and challenges. The course is organized into week-long, “stand alone” modules that cover integrative, translational topics in immunology, cardiovascular physiology, endocrinology, and neurobiology (e.g. influenza, congestive heart failure, sleep disorders, drug addiction, space physiology). Course meetings are a mixture of lectures and in-class discussions led by the participating faculty, as well as laboratory exercises and demonstrations, including human brain dissections, visits to clinical laboratories and diagnostic centers, and “hands on” opportunities with state-of-the-art electrophysiological and cardiovascular techniques. Course activities are supplemented by primary research articles, reviews, and other on-line materials.