

PSYCHOLOGICAL AND BRAIN SCIENCES

<http://pbs.jhu.edu/>

The psychological and brain sciences are concerned with understanding the biological and psychological processes underlying animal and human behavior at all stages of development.

The undergraduate program leading to the baccalaureate degree is intended to provide students with a sound background in psychological and brain sciences and, at the same time, to prepare them for advanced study.

The program for doctoral students in psychological and brain sciences has a strong empirical focus and emphasizes research methodology. The broad aim of the graduate program is to train students to become scientists rather than practitioners.

Facilities

The department's offices and laboratories contain dozens of desktop computers (PCs and Macintoshes) and UNIX workstations used for experimental control and for computational studies, simulation, data analysis, and manuscript preparation.

The F. M. Kirby Research Center for Functional Brain Imaging houses 3.0T and 7.0T Philips research-directed MRI scanners for fMRI studies of human perception, memory, and cognition.

The cognitive psychology and cognitive neuroscience laboratories contain a wide range of computer equipment and special-purpose research equipment, including image-processing and large-format graphics systems, eye-movement monitors, speech recognition and analysis systems, stereoscopic graphic systems, video equipment, EEG, Transcranial Magnetic Stimulation, and other stimulus-presentation and response-collection devices.

The biopsychology laboratories have all the facilities necessary to conduct modern behavioral neuroscience research, including equipment for behavioral and operant testing, electrophysiology, histology, surgery, neurochemistry, and systems for the analysis and synthesis of audio signals.

Programs

- Psychology, Bachelor of Arts (<http://e-catalog.jhu.edu/arts-sciences/full-time-residential-programs/degree-programs/psychological-brain-science/psychology-bachelor-arts/>)
- Psychology, Minor (<http://e-catalog.jhu.edu/arts-sciences/full-time-residential-programs/degree-programs/psychological-brain-science/psychology-minor/>)
- Psychology, PhD (<http://e-catalog.jhu.edu/arts-sciences/full-time-residential-programs/degree-programs/psychological-brain-science/psychology-phd/>)

For current course information and registration go to <https://sis.jhu.edu/classes/>

Courses

AS.200.101. Introduction To Psychology. 3 Credits.

Do we all see colors the same way? How did so many 'good' people support the Nazi party? Do crossword puzzles really stave off Alzheimer's Disease? This course tries to answer these questions and many others, providing a comprehensive overview of the scientific study of the mind. We'll explore topics such as perception, language, memory, decision-making, creativity, love, sex, art, politics, religion, dreams, drugs, brain damage and mental illness, grappling with deep and long-standing controversies along the way: differences between the sexes, the relationship between mind and brain, causes and consequences of racism, human uniqueness (or not) within the animal kingdom, nature vs. nurture, good and evil, consciousness. Appropriate for anyone wanting to know who and what we are as human beings (or who noticed that psychology is now on the MCAT).

Area: Natural Sciences, Social and Behavioral Sciences

AS.200.109. Introduction to Clinical Psychology. 1 Credit.

Students will be exposed to the practice and science of Clinical Psychology. Students will learn about various clinical characteristics of psychiatric disorders and treatments available for these conditions. This class will emphasize critical thinking and analysis. It is designed to help students gain an understanding of the scientific strengths and limitations essential to becoming a good diagnostician, therapist, and researcher in the field. This course does not count towards the psychology major.

AS.200.110. Introduction to Cognitive Psychology. 3 Credits.

Introductory survey of current research and theory on topics in cognitive psychology. The course will cover a range of topics in perception, attention, learning, reasoning, and memory, emphasizing relationships among mind, brain, and behavior.

Area: Natural Sciences, Social and Behavioral Sciences

AS.200.132. Introduction to Developmental Psychology. 3 Credits.

An introductory survey of human development from the prenatal period through adolescence. The developing child is examined in terms of cognitive, social, emotional, motor, and language development.

Area: Social and Behavioral Sciences

AS.200.133. Introduction to Social Psychology. 3 Credits.

An introductory survey of social psychology. Topics include social perception, social cognition, attitudes, prejudice, attraction, social influence, altruism, aggression, and group behavior.

Area: Social and Behavioral Sciences

AS.200.141. Foundations of Brain, Behavior and Cognition. 3 Credits.

A survey of neuropsychology relating the organization of behavior to the integrative action of the nervous system. Cross-listed with Behavioral Biology and Neuroscience.

Area: Natural Sciences, Social and Behavioral Sciences

AS.200.142. Profiling Mentally Ill Mass Murderers. 1 Credit.

Mass Shootings by mentally ill are a scourge upon society. Factors like easy access to guns by dangerous mentally ill, inadequate commitment laws, the inability to predict dangerous behavior, and media frenzy, contribute to an increasing death toll. This course uses case studies to highlight the role played by diagnostic assessment (suicide by cop, psychopathic behavior, PTSD, major mental disorders), inadequate prevention civil and gun policy strategies, and stigmatization of the mentally ill as dangerous. Pre-college students only.

Area: Humanities, Social and Behavioral Sciences

AS.200.159. Freshmen Seminar: Evolutionary Psychology. 1 Credit.

In this course we discuss evolutionary psychology, which is the idea that the mind can be understood as an adaptation to our ancestral environment by means of natural selection. Freshmen only. Note: This course does not count towards the Psychology major.

Area: Natural Sciences, Social and Behavioral Sciences

AS.200.161. Illusions, delusions, and other confusions. 1 Credit.

This course is suitable for all, but would be especially useful for a student who does not expect to take many (or any) additional psychology or cognitive science courses. We will explore what modern psychology has uncovered about how our intuitions concerning human nature deceive us. Freshmen Only. Note: This course does not count towards the Psychology major.

Area: Social and Behavioral Sciences

AS.200.162. Childhood Disorders & Treatments. 3 Credits.

This is an online course. The class will meet for ten weeks from May 26 through July 31 and will follow the deadlines for Term I for add/drop/withdraw and grade changes. This course examines the psychological disorders that are usually first diagnosed prior to adulthood. Some of the specific disorders that will be discussed are Attention-Deficit and Disruptive Behavior Disorders, Pervasive Developmental Disorders, Learning Disorders and Intellectual Disability. Students will become familiar with various diagnoses, etiologies, and methods of treatment. Note: This course does not count towards the Psychology major.

Area: Social and Behavioral Sciences

AS.200.163. Gamechangers: Conceptual Breakthroughs in Neuroscience. 3 Credits.

Freshman Seminar; This introductory class will highlight some of the key findings in neuroscience over the past century and a half that have revolutionized our understanding of how the brain works. The goal is to convey both the essence of, and the excitement surrounding, neuroscience breakthroughs that caused paradigm-shifts. We will also look at recent neuroscience-related headlines in popular media and unpack them from a scientific perspective. Topics covered will include "Is the brain just one big lump of tissue?", "Telephones in the brain?", "The frog with upside-down vision", "Brains vs. hard-drives", "Monkey see=monkey do neurons", Epigenetics, "Changing the brain's wiring diagram", "Do ants have GPS?", The science behind the movie 'Memento', "Implanting false memories into brains", "My brain sees you, but I don't", etc. For each big question, we will first examine the thinking that previously existed, and then explore the shift in thinking. Note: This course does not count towards the Psychology major.

Area: Natural Sciences

Writing Intensive

AS.200.200. Research Methods in Psychology. 4 Credits.

The goal of this course is to introduce how psychological scientists develop and test research questions about the mind and behavior. We will explore how empirical investigation differs from other ways of making discoveries and learning about the world, and how psychologists employ various methodologies to tackle their phenomena of interest. We will examine the relationships between research questions and research designs, the benefits and drawbacks of differing measurement and sampling approaches, the ethical implications of various research paradigms, and best practices in communicating research findings clearly and engagingly. You will have the opportunity to engage "hands-on" with the research process through interactive labs and demonstrations. Over the course of the semester, you will develop and receive feedback on a research proposal, which will serve as a foundation for the spring course "Design and Analysis for Experimental Psychology".

Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences

Writing Intensive

AS.200.201. Design & Statistical Analysis for Psychology. 4 Credits.

The goal of this course is to expose you to the processes of data collection, analysis, and dissemination in psychology. This course is the follow-up to "Research Methods in Experimental Psychology," and therefore will draw on the methodological principles and practices covered in the Fall semester. This course will cover a wide array of analytical techniques (i.e., statistics) that you will apply to data collected as part of a semester-long group research project. The course will also include extensive coverage of the R programming language for use in data management, analysis, and visualization. With your group members, you will collect primary research data, carry out appropriate statistical tests, compose individual research manuscripts, and collectively present a poster at an on-campus research symposium. In combination with the Fall course, this class will serve as strong preparation for those considering honors theses, joining research labs at Homewood and/or JHMI, conducting independent research projects, and ultimately pursuing careers/graduate work in experimental psychology.

Prerequisite(s): AS.200.200 (was AS.200.207)

Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences

Writing Intensive

AS.200.202. Forensic Psychology. 3 Credits.

The field of forensic psychology is focused on answering legal questions about the causes of human behavior. This survey course will explore the work that forensic psychologists do; their research, assessment, and clinical methods; and how their work influences lawyers, judges, and other legal practitioners. Specific topics will include mental capacity assessment, psychopathy, claims of mental distress, child custody evaluations, juvenile delinquency, forensic treatment, and forensic neuropsychological assessments.

Prerequisite(s): Students can only receive credit for AS.200.202 or AS.200.325, not both.

Area: Social and Behavioral Sciences

AS.200.204. Human Sexuality. 3 Credits.

Course focuses on sexual development, sexuality across the lifespan, gender identity, sexual attraction and arousal, sexually transmitted disease, and the history of commercial sex workers and pornography. Please note that the use of electronic devices is not permitted during this class, in order to promote the full interactive potential of this engaging seminar-style offering. Open to Juniors & Seniors within the following majors/minors: Behavioral Biology; Biology; Cognitive Science; Medicine, Science & the Humanities; Molecular & Cellular Bio; Neuroscience; Psychological & Brain Sciences; Public Health; Sociology; Study of Women, Gender, & Sexuality.

Corequisite(s): Students may enroll in both AS.200.204 and AS.290.420, but cannot do so in the same semester.

Area: Social and Behavioral Sciences

AS.200.205. Psychological Profiling. 1 Credit.

"Psychological Profiling" focuses on strengths and limitations of psychological methods employed by forensic professionals who assist police in criminal investigations. Clinical cases of serial offenders, spree killers, disgruntled employees, police profiling, and terrorists will be studied. Legal and ethical issues will be explored, especially racial profiling controversies. We anticipate visits to the FBI Behavioral Sciences Unit at Quantico, Virginia; Baltimore County Forensic Crime Lab (with emphasis on crime scene analysis), and the Baltimore Police Profiling Program. This course does not count towards the psychology major.

Area: Social and Behavioral Sciences

AS.200.208. Animal Behavior. 3 Credits.

Examines basic principles of animal behavior (orientation, migration, communication, reproduction, parent-offspring relations, ontogeny of behavior and social organization). Evolution and adaptive significance of behavior will be emphasized.

Prerequisite(s): AS.200.141 OR Permission of Instructor.

Area: Natural Sciences, Social and Behavioral Sciences

AS.200.209. Personality. 3 Credits.

This is a survey course focused on theory and research on human personality. Topics include personality traits, motivation, unconscious processes, self-regulation, cognitive and behavioral aspects of personality, biological and evolutionary influences on personality, and dysfunctional manifestations of personality.

Area: Social and Behavioral Sciences

AS.200.211. Sensation & Perception. 3 Credits.

This course surveys how stimuli from the environment are transformed into neural signals, and how the brain processes those signals to interpret the objects and events in the world. A primary focus will be on the visual system, with additional coverage of hearing, touch, taste, and smell.

Area: Natural Sciences, Social and Behavioral Sciences

AS.200.212. Abnormal Psychology. 3 Credits.

A survey of the major syndromes of psychological disorders. Research and theory about the mechanisms, development, and diagnosis of psychopathology are emphasized.

Area: Social and Behavioral Sciences

AS.200.220. Health Studies: Application of Abnormal Psychology to Forensic Cases. 1 Credit.

This introductory course will examine the basic diagnostic psychology principles with special application to forensic psychology. The class will focus on investigating forensic psychology queries including: Does my client have a mental illness? Why did he or she act in such a self-defeating way? Does the law require special disposition? Should my client be punished or rehabilitated? We will explore the reasons behind why a movie star would shoplift or a famous athlete would engage in a series of extra marital relationships; why a policeman would commit a series of bank robberies in broad daylight; or why someone would shoot a Congresswoman and kill and wound many others in the process. As part of this course, students will visit with doctors and lawyers (including Judges), view and analyze video and movies about forensic cases, and participate in mock trial exercises. Note: This course does not count towards the Psychology major.

Area: Social and Behavioral Sciences

AS.200.222. Positive Psychology. 3 Credits.

The course will review the growing field of positive psychology and will review the research on positive human attributes such as optimism, happiness, hope, resiliency, self-esteem, altruism, empathy, and forgiveness. This course will explore the research on how such positive attributes are developed and how they relate to psychological and physical well-being.

Area: Social and Behavioral Sciences

AS.200.240. Industrial and Organizational Psychology. 3 Credits.

This course provides a survey of the field of Industrial and Organizational Psychology, a scientific discipline that studies human behavior in the workplace. The course focuses on understanding the psychological bases of work behaviors, cognitions, and emotions and practices that can be implemented to create a good fit between employees' characteristics and work demands. A number of topics are addressed in the scientist-practitioner model, including the structure/characteristics of jobs, techniques for assessing and supporting employee performance, selecting and training a workforce, and the various mechanisms that influence employee motivation and attitudes, among other topics. Real-world applications and research are emphasized throughout the course.

Area: Social and Behavioral Sciences

AS.200.301. History Of Psychology. 3 Credits.

A survey of leading figures, schools, and systems in the history of psychology. The course will emphasize the development of experimental psychology in late 19th century Germany and its establishment in America at Johns Hopkins, Harvard, Chicago, and Columbia. Special topics will include the development of clinical and applied psychology and psychological testing. Enrollment limited to Juniors and Seniors only. Sophomores with instructor approval. Recommended Course Background: two prior Psychology courses.

Area: Humanities, Social and Behavioral Sciences

AS.200.302. Behavioral Assessment of Animal Models of Cognition and Neuropsychiatric Disorders. 3 Credits.

What does a rat exploring its environment tell us about memory? How can a mouse help us better understand schizophrenia? This course will focus on procedures that are routinely used to study behavior in animal models of cognition and neuropsychiatric disorders. The procedures discussed will include assessments that fall into 3 broad functional domains: motor function, affective or emotional states, and cognition. Throughout the course, we will read and discuss original research articles to illustrate and compare some of the measures and results from the various procedures. Postdoc Teaching Fellowship. This is designed to be an upper level course.

Area: Social and Behavioral Sciences

AS.200.304. Neuroscience of Decision Making. 3 Credits.

This course will survey the neural mechanisms of decision-making. Current experimental research and theory concerning selection, control, and evaluation of actions are examined in humans and animals. Topics will range from simple perceptual judgements to complex social behavior. The course involves a weekly lecture about a specific topic followed by a student presentation of a current research paper. Cross-listed with Neuroscience.

Prerequisite(s): AS.080.305 AND AS.080.306 or instructor permission
Area: Natural Sciences

AS.200.305. Advanced Seminar in Forensic Psychology. 3 Credits.

Forensic psychologists determine clinical diagnoses and offer expert opinions to assist court decision makers who must employ legal tests to make case determinations. This course will explore how forensic psychologists communicate with the courts via consultation, report writing, and expert testimony. Students will write forensic analyses on a variety of controversial, cutting edge forensic topics (e.g., for competence to stand trial, child abuse, civil commitment, compensation for mental injuries, sex offender commitment, insanity, fitness for duty, child custody). Recommended background: AS.200.212

Prerequisite(s): AS.200.202

Area: Natural Sciences, Social and Behavioral Sciences

Writing Intensive

AS.200.307. Medical Psychology. 3 Credits.

Medical Psychology is a specialization within clinical psychology that focuses on the application of psychological theories, research, and techniques to physical health problems and health promotion. Students will learn about the consultation process and interventions used in medical psychology practice to improve the physical and psychological health of medical patients, including those with chronic conditions (e.g., chronic pain, heart disease) and those with acute illnesses and injuries. Enrollment limited to Junior & Senior Psychology Majors or with instructor approval.

Prerequisite(s): AS.200.212

Area: Social and Behavioral Sciences

AS.200.311. Sensory Representations in the Brain: Maps, Modules, & Distributed Coding. 3 Credits.

In this course we will explore the ways in which information from vision, hearing, touch, smell, and taste is encoded in the brain. We will compare and contrast different representation schemes and their computational advantages in order to uncover some overarching organizing principles of sensory processing in the brain. Class meetings will consist of lectures plus group discussions of classic papers in cognitive neuroscience, computational modeling, and neurophysiology. Enrollment limited to Juniors & Seniors.

Prerequisite(s): AS.200.211 OR AS.080.203 OR AS.050.203 OR AS.200.141 OR AS.020.312

Area: Social and Behavioral Sciences

AS.200.313. Models of Mind and Brain. 3 Credits.

This is a seminar surveying computational approaches to understanding mental and neural processes, including sensory and conceptual representation, categorization, learning and memory. The course will also develop familiarity with computational tools such as numerical simulation, linear transformation and data visualization. Recommended Course Background: AS.110.106 / Calculus I OR AS.110.108 Calculus I, AS.050.101 / Cognition OR AS.200.211 / Sensation & Perception OR AS.080.105 / Introduction to Neuroscience OR other introductory coursework in cognitive & neural sciences. Experience with at least one programming language is strongly recommended.

Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences

AS.200.316. Thought and Perception. 3 Credits.

This year's topic: Philosophical, Foundational, and Methodological Issues Connected to Bayesian Approaches in Cognitive Science. Bayesian probability theory and Bayesian decision theory aim to lay out how ideal reasoners update their beliefs in the light of new evidence and make decisions based on those beliefs. But what about such apparently non-ideal agents such as ourselves? The past few decades have witnessed a rising tide of Bayesian work on perception, higher cognition, neural coding, etc. It's been accompanied by vigorous debate concerning the aims and claims of these approaches. Some see the prospect of a grand unified theory of the mind/brain; others demur. We'll examine these debates and what one can learn from them regarding more generally about approaches to modeling the mind and the nature of rationality. Readings will be drawn both from the empirical and the philosophical literature. (This course meets jointly with AS.200.616 & AS.150.476)

Area: Humanities, Social and Behavioral Sciences

Writing Intensive

AS.200.317. Interpersonal Relations. 3 Credits.

This course will investigate interpersonal processes ranging from attraction and courtship to relationship functioning and distress. Enrollment limited to Psychology majors, Psychology minors, and Behavioral Biology majors.

Prerequisite(s): AS.200.133

Area: Social and Behavioral Sciences

AS.200.320. The Interface of Psychology & Semantics: Procedural Matters. 3 Credits.

Often, languages are described as sets of expressions. But in acquiring a language, a child acquires a procedure that generates expressions. If Linguistic expressions pair pronunciations with mental representations, then one task shared by linguists and psychology is to specify the forms of these representations. This seminar explores this relationship in detail.

Area: Natural Sciences, Social and Behavioral Sciences

AS.200.321. Child and Adolescent Psychopathology. 3 Credits.

This course focuses on mental disorders in children and adolescents. The course begins with an exploration of the general models and theories for why psychopathology occurs in childhood. The second portion of the course provides a systematic review of the symptoms, course, risk factors, theories, and treatments for specific disorders, including mood disorders, anxiety disorders, autism, ADHD, eating disorders, and behavioral disorders.

Prerequisite(s): AS.200.212

Area: Social and Behavioral Sciences

AS.200.322. Clinical Neuropsychology. 3 Credits.

Clinical Neuropsychology is a clinical psychology specialty focused on assessment and treatment of acquired or developmental disorders of the nervous system, including dementia, neurodegenerative disorders, traumatic brain injury, learning disabilities, and neurodevelopment disorders. This course will focus on research findings and techniques used by psychologists in the assessment, treatment, and rehabilitation processes. Recommended Course Background: AS.200.141 / Foundations of Brain Behavior Cognition.

Prerequisite(s): AS.200.141

Area: Social and Behavioral Sciences

AS.200.323. Psychology and Social Media. 3 Credits.

This course explores modern-day social media use (e.g., Facebook, Match.com) through multiple theoretical lenses within psychology. Through weekly student-led discussions and readings, it will accomplish 3 aims: 1) applying psychology of identity, motivation, and communication to social media (e.g., self-presentation, intergroup dynamics), 2) investigating clinical/health implications of social media use (e.g., addiction, loneliness), and 3) exploring social media as data-gathering environments (e.g., user experience research from already committed guest-speakers who work in social media industries).

Area: Social and Behavioral Sciences

AS.200.326. Law, Psychology and Public Policy. 3 Credits.

An introduction to applications of psychological research in policy analysis. Special emphasis is given to the use and misuse of psychology in Supreme Court advocacy and decision making in the areas of children's rights, adult sexuality, and educational and employment opportunity. Recommended Course Background: Statistics & Regression Analysis

Area: Social and Behavioral Sciences

Writing Intensive

AS.200.329. Real World Human Data: Analysis & Visualization. 3 Credits.

Experiments in human cognition typically involve careful manipulation and control of variables in order to answer specific questions about the mind or brain. However, digital devices now provide an ocean of incidental human data: information collected continuously about our behavior and physiological states as we go about our lives. These incidental datasets are often large and noisy, and pose different analysis and visualization challenges from more traditional manipulated experiments. In this course students will learn computational tools and qualitative approaches for exploring, visualizing and interpreting large human data. The course emphasizes computer-based analysis of open-source human behavioral and neuroimaging datasets. Analyses will be conducted in MATLAB. Instructor will grant approval as long as you have previous programming experience (roughly equivalent to material covered in an introductory-level programming course). Self-taught or real-world experience can be applicable in lieu of previous formal classroom instruction.

Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences

AS.200.332. Seminar in Theoretical Neuroscience. 3 Credits.

This course develops a theoretical understanding of the large-scale anatomical and functional organization of the mammalian cerebral cortex. We will discuss primary research readings and will implement essential concepts in numerical simulations. The theoretical principles to be explored will include: hierarchy; normalization; pattern completion; prediction; gradient-based learning; and conjunctive representation. We will consider the broader motivation for each of these computational principles, and we will ask how successfully they organize the empirical data about our brains. Specific questions include: What are the functional benefits of a hierarchical anatomical organization of the cerebral cortex? Do neocortical circuits generically implement a normalization operation? How and why is pattern completion implemented in the neocortex and the hippocampus? Can gradient-based representational learning occur in the cerebral cortex without external supervision or reinforcement signals? How is the flow of information between brain regions regulated? How can distinct cortical representations be "bound" into joint representations? Cal 1; Computational Science or some programming experience highly recommended. Instructor approval required.

Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences

AS.200.333. Advanced Social Psychology. 3 Credits.

The class is designed as a seminar including discussion of primary readings of social psychology articles ranging in topics from interpersonal relationship to behavior in large groups. Rising junior & senior Psychology majors only.

Prerequisite(s): AS.200.133

Area: Social and Behavioral Sciences

AS.200.334. Human Memory Psychology. 3 Credits.

This class will survey the behavioral and biological science of human memory. Historical perspectives as well as modern controversies will be discussed. Intersections with other fields such as law, education, medicine, and technology will be highlighted. The course will be a mixture of lectures and group discussions.

Area: Social and Behavioral Sciences

AS.200.335. How Does the Brain Predict the Future?. 3 Credits.

"Have you ever wondered how you predict the beat will drop in a song or that a traffic light will change? A combination of evolution and experience have wired your brain to generate predictions about the future. In this course, you will learn about the factors which influence neural predictions. Understanding how the brain forms predictions is critical to understanding perception, movement, music, language, and cognition. Some examples include: hallucinations, how we walk, why we like pop music, how we converse, and how we make plans. We will read news articles and original research to strengthen scientific literacy and critical thinking. The content of our readings will encompass a variety of research methods (including behavioral assessment, fMRI, single electrode recordings, EEG, and ECoG). We will discuss key factors in neural predictions, such as: predictive domain (what is the objective of the prediction and where does it occur in the brain?), specificity (is the prediction very detailed or general?), timescale (when is something predicted to occur?), statistics (how probable is the predicted outcome?), consciousness (do you explicitly or implicitly know the prediction?), and reward (how much reward is associated with the predicted outcome?). Finally, we will talk about general theories of prediction, including predictive coding and Bayesian inference."

Prerequisite(s): AS.200.141 OR AS.080.306

Area: Natural Sciences

AS.200.339. Cognitive Development. 3 Credits.

How do children acquire knowledge about the world? In this course, we will explore how children understand the world, looking at concepts of objects, number, space, and other people. Students will read both empirical and theoretical writing on these topics, participate in class discussions, and complete short critical writing assignments and final literature review paper.

Area: Natural Sciences, Social and Behavioral Sciences

AS.200.344. Behavioral Endocrinology. 3 Credits.

An examination of the effects of hormones on behavior in non-human and human animals. Topics will include the effects of hormones on sexual differentiation, reproductive behavior, parental behavior, homeostasis and biological rhythms, regulation of body weight, learning and memory. Cross-listed with Behavioral Biology and Neuroscience.

Prerequisite(s): (AS.200.141 OR AS.080.306) OR (AS.020.151 AND AS.020.152) or instructor's permission

Area: Natural Sciences, Social and Behavioral Sciences

AS.200.350. Why is thinking hard?. 3 Credits.

In what ways and why is human cognition limited? This seminar will focus on understanding and explaining the limitations and capabilities of human cognition through deep dives into a number of subtopics. Possible topics include: What is 'intelligence,' does it have quantifiable units and/or a substance-like underpinning. Why does thinking feel hard, why and how do we experience mental effort? What limits visual attention and working memory? Where does insight come from? Why do we forget things? What is creativity? What makes some concepts hard to learn? Why do we misunderstand science? How do we evaluate our own knowledge and understanding?

Prerequisite(s): AS.200.110

Area: Social and Behavioral Sciences

AS.200.357. Advanced Statistical Methods. 3 Credits.

Topics in applied probability and statistical inference; analysis of variance; experimental design. Recommended Course Background: one statistics course.

Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences

AS.200.361. Tests & Measurements. 3 Credits.

Psychological tests and measures are used in several settings including research, clinical, business, forensic, school and other applied settings. This course will consider the methodological and practical issues involved in test construction, the evaluation of instruments, and the uses of psychological tests across settings and for different purposes. Examples of assessments that may be discussed are aptitude and achievement tests; personality and behavioral inventories; neuropsychological tests, observations and interviews; and tests for employment and forensic use. Enrollment limited to Junior & Senior Cognitive Science & Psychology Majors, or instructor approval.

Prerequisite(s): AS.200.201

Area: Social and Behavioral Sciences

AS.200.368. Sleep, Dreams, and Altered States of Consciousness. 3 Credits.

Sleep, dreaming, resting and arousal to waking represent very different states of consciousness which differ dramatically both psychologically and physiologically. This course focuses on cognitive, psychological, physiological, biological and genetic aspects characterizing each of these states with some reference to other altered states. The course includes a focus on the major pathologies affecting sleep-wake states. Clinical cases will be considered. These inform about both psychological and biological aspects of these states. The relative biological functions of each state will be evaluated with particular attention to the mystery of why we have and apparently need REM and NREM sleep. Actual physiological recordings of sleep states will be reviewed and the student will learn how these are obtained and how to evaluate these. The circadian rhythms, ontogeny and evolution of these sleep-wake states will also be covered. This will include a review of information learned from non-human animal sleep. The change from sleep to full awakening reflects change toward increasing brain organization supporting consciousness. Understanding of the neurobiology of these states will be used to explore some of the more modern and scientific concepts of human self-awareness or consciousness. Recommended Course Background: AS.200.101 OR AS.080.203 OR AS.050.203

Area: Natural Sciences, Social and Behavioral Sciences

AS.200.369. Neuroscience of Motivation & Reward. 3 Credits.

This course will explore the neurobiological bases of motivated behavior, including eating, drinking, and reproduction, tracing the history of our understanding from early neuroscientific studies to the modern day, with a focus on mammalian model systems. We will discuss innate motivated behaviors, and well as how learning can guide the expression of these behaviors. Neural mediation of processes such as reward and aversion will be considered in depth, as will applications of these findings to the understanding of addiction and other behavioral disorders. The course will be a mixed lecture/seminar format; we will read original research articles and scholarly reviews.

Prerequisite(s): AS.080.306 (students may enroll concurrently); AS.080.305; Students may not have taken AS.200.366.

Area: Natural Sciences

AS.200.370. Functional Human Neuroanatomy. 3 Credits.

This course examines the general organizing principles of the anatomy of the human central nervous system and how this anatomical organization relates to function, from the level of neural circuits, to systems, to behavior. Students will learn to identify neuroanatomical structures and pathways in dissections and MRI images through computerized exercises. Readings and lectures will emphasize general structure-function relationships and an understanding of the functional roles of particular structures in sensory, motor, and cognitive systems.

Prerequisite(s): AS.080.305 AND AS.080.306 or Instructor Permission

Area: Natural Sciences, Social and Behavioral Sciences

AS.200.376. Neuropsychopharmacology. 3 Credits.

Designed to provide information about how drugs affect the brain and behavior. The course focuses on biological concepts underlying structures and functions of the brain that relate to mental disorders. An introduction to neurobiology and brain function is presented as it applies to the interaction of various classes of drugs with the individual neurotransmitter systems in the brain. A brief historic review is followed by a discussion of clinical relevance. Cross-listed with Behavioral Biology and Neuroscience. Enrollment limited to juniors and seniors.

Prerequisite(s): (AS.080.305 AND AS.080.306) OR AS.020.306 AND AS.020.312) OR (AS.200.141 AND AS.020.306)

Area: Natural Sciences, Social and Behavioral Sciences

AS.200.377. Neuroethology. 3 Credits.

A comparative and evolutionary approach to understanding the neural underpinnings of biologically relevant behaviors in vertebrate and invertebrate animals. Enrollment limited to Sophomores, Juniors, Seniors or by instructor approval. Recommended Course Background: AS.200.141 Area: Natural Sciences

AS.200.379. Research Seminar in Clinical Psychology. 3 Credits.

A small group exploration of current issues in clinical psychology, aimed at developing students' empirical research skills. Following critical analysis of the empirical literature, students develop research proposals for novel research and/or conduct research and author research reports. Topics vary by semester. In the current offering, the topic will be stress, coping, emotion-regulation, peer relationships, and psychopathology among adolescents and emerging adults. Recommended Course Background: AS.200.212 Abnormal Psychology AND EN.553.111 Statistical Analysis I AND EN.553.112 Statistical Analysis II AND AS.200.207 Research Methods in Experimental Psychology. Enrollment limited to Junior & Senior Psychology majors & minors by instructor approval.

Prerequisite(s): AS.200.212

Area: Social and Behavioral Sciences

Writing Intensive

AS.200.380. Neurobiology of Human Cognition. 3 Credits.

The complexity of human behavior surpasses even our closest primate relatives. Only humans communicate through language, build complex technology, devise legal system and wage war. What neurobiological capacities set humans apart from other animals? This course will explore the neurobiology of cognition, focusing on cognitive domains that are particularly developed in the human species: language, social cognition, number, executive function and concepts. The course format will consist of lectures and in class workshops.

Prerequisite(s): AS.200.141 OR AS.200.312 OR AS.080.105 OR AS.080.203 OR AS.050.203 OR AS.050.312

Area: Natural Sciences, Social and Behavioral Sciences

AS.200.382. Models of Psychotherapy. 3 Credits.

This course reviews the major models of psychotherapy, including psychodynamic, cognitive, behavioral, interpersonal, and family therapy, with a focus on modern and empirically supported treatments. The application of the models through the analysis of clinical case studies is emphasized. Restricted to Junior & Senior Psychology Majors.

Prerequisite(s): AS.200.212

Area: Social and Behavioral Sciences

Writing Intensive

AS.200.385. Mind, Brain & Experience. 3 Credits.

How do nature and nurture shape the human mind? How does experience contribute to the development of visual perception, language and social reasoning? This course explores insights into these age-old questions from neuroscience and psychology. Studies of infant behavior reveal rich knowledge about objects and people in the first months of life.

At the same time, experience has profound effects on behavior and neurobiology. For example, temporary absence of vision (i.e. blindness) during development permanently alters visual perception and the visual cortex. Key evidence also comes from studies of naturally occurring variation in human experience (e.g. blindness, deafness, socioeconomic and cultural differences). We will discuss what such studies of cognitive and neural function tell us about the origins of human cognition. This is a writing intensive course with weekly lectures and seminar style discussion of primary sources. Students will be required to write weekly responses to readings and a term paper.

Prerequisite(s): AS.200.141 OR AS.050.105 OR AS.080.105 OR AS.050.203 OR (AS.080.305 AND AS.080.306) OR AS.080.203

Area: Natural Sciences, Social and Behavioral Sciences

Writing Intensive

AS.200.386. Animal Cognition. 3 Credits.

Examine relations between brain, mind, and behavior in nonhuman animals, focusing on topics such as learning, memory, attention, decision-making, navigation, communication, and awareness. We will take a variety of approaches, including behavioral, computational, evolutionary, neurobiological, and psychological perspectives.

Prerequisite(s): AS.200.141 OR AS.200.208 OR AS.290.101 or Instructor permission.

Area: Social and Behavioral Sciences

AS.200.388. Occupational Health Psychology. 3 Credits.

Occupational Health Psychology (OHP) concerns the application of psychology to improving the quality of work life, and to protecting and promoting the safety, satisfaction, health, and well-being of workers. This course will consider a broad range of topics in OHP including the role of work on well-being, job stress and burnout, diversity and work, safety climate, work-family balance, conflict, and counterproductive work behaviors. The emphasis will be on drawing connections between OHP theory and OHP practice and at the relationship between individual and organizational health and well-being. This class should be of interest to students interested in industrial/organizational psychology, social psychology, health psychology, clinical psychology, human factors, public health, preventive medicine, and industrial engineering.

Prerequisite(s): AS.200.240 or instructor permission

Area: Social and Behavioral Sciences

AS.200.401. Careers in Psychology - Freshmen. 1 Credit.

An introduction to the varied career paths offered across the field of psychology, hosting a diverse representation of speakers from various Johns Hopkins institutions and the local Baltimore community.

Area: Social and Behavioral Sciences

AS.200.402. Careers in Psychology - Sophomore. 1 Credit.

An introduction to the varied career paths offered across the field of psychology, hosting a diverse representation of speakers from various Johns Hopkins institutions and the local Baltimore community.

Area: Social and Behavioral Sciences

AS.200.403. Careers in Psychology - Juniors & Seniors. 1 Credit.

An introduction to the varied career paths offered across the field of psychology, hosting a diverse representation of speakers from various Johns Hopkins institutions and the local Baltimore community.

Area: Social and Behavioral Sciences

AS.200.404. Careers in Psychology - Seniors. 1 Credit.

An introduction to the varied career paths offered across the field of psychology, hosting a diverse representation of speakers from various Johns Hopkins institutions and the local Baltimore community.
Area: Social and Behavioral Sciences

AS.200.501. Psychological Research - Freshmen. 3 Credits.

S/U grading only.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.502. Psychology Research-Freshmen. 0 - 3 Credits.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.503. Psychological Research - Sophomores. 3 Credits.

S/U grading only

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.504. Psychology Research-Sophomores. 0 - 3 Credits.

Grading Satisfactory/ Unsatisfactory only.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.506. Psychological Readings. 0 - 3 Credits.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.509. Internship-Psychology. 1 Credit.

S/U grading only.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.510. Psychology Internship. 0 - 3 Credits.

Grading Satisfactory/ Unsatisfactory only.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.511. Psychological Research - Juniors. 3 Credits.

S/U grading only.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.512. Psychology Research-Juniors. 0 - 4 Credits.

Grading Satisfactory/ Unsatisfactory only.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.513. Psychological Research - Seniors. 3 Credits.

The student chooses some research problem with the advice and approval of a faculty member. S/U grading only.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.514. Psychology Research-Seniors. 0 - 4 Credits.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.519. Seniors Honors Research. 3 Credits.

Seniors working on the honors thesis enroll with the approval of the undergraduate coordinator.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.520. Seniors Honors Research. 0 - 3 Credits.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.540. Independent Study-Seniors. 1 - 3 Credits.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.541. Independent Study - Juniors. 3 Credits.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.542. Independent Study - Sophomores. 3 Credits.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.595. Internship. 1 Credit.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.597. Psychology Research. 3 Credits.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.599. Independent Study. 1 - 3 Credits.

Prerequisite(s): You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration & Online Forms.

AS.200.613. Fundamentals of Biopsychology.

This is a required course for all first year PhD students in the Department of Psychological and Brain Sciences. The course covers foundational concepts and methods in neurobiology and cognitive neuroscience.
Area: Natural Sciences, Social and Behavioral Sciences

AS.200.616. Thought and Perception.

This year's topic: Philosophical, Foundational, and Methodological Issues Connected to Bayesian Approaches in Cognitive Science. Bayesian probability theory and Bayesian decision theory aim to lay out how ideal reasoners update their beliefs in the light of new evidence and make decisions based on those beliefs. But what about such apparently non-ideal agents such as ourselves? The past few decades have witnessed a rising tide of Bayesian work on perception, higher cognition, neural coding, etc. It's been accompanied by vigorous debate concerning the aims and claims of these approaches. Some see the prospect of a grand unified theory of the mind/brain; others demur. We'll examine these debates and what one can learn from them regarding more generally about approaches to modeling the mind and the nature of rationality. Readings will be drawn both from the empirical and the philosophical literature. (This course meets jointly with AS.200.316 & AS.150.476) Writing Intensive

AS.200.617. Fundamentals of Cognitive Psychology.

This is a required course for all first year PhD students in the Department of Psychological and Brain Sciences. The course covers foundational concepts and methods in cognition.

AS.200.648. Aging, Cognition, and Neurodegenerative Disorders I.

This course will provide an overview of clinical, neuropsychological, imaging and neuropathological approaches to the study of cognitive systems altered in aging, AD and other neurodegenerative disorders. It will consider research using animal models as well as human subjects and clinical populations. The course is intended for graduate students and is open to advanced undergraduates only with permission of the professor. Predoctoral and Postdoctoral students from A&S, SPH and SOM students participating in the NIA Training Program on Age-Related, Cognitive and Neuropsychiatric Disorders are required to take this course; meets concurrently with PH.330.802(01).

AS.200.649. Aging, Cognition, and Neurodegenerative Disorders II.

Second part of a two-semester course. Course will provide an overview of clinical, neuropsychological, imaging and neuropathological approaches to the study of cognitive systems altered in aging, AD and other neurodegenerative disorders. It will consider research using animal models as well as human subjects and clinical populations. The course is intended for graduate students and is open to advanced undergraduates only with permission of the professor. Predoctoral and Postdoctoral students from A&S, SPH and SOM students participating in the NIA Training Program on Age-Related, Cognitive and Neuropsychiatric Disorders are required to take this course; meets concurrently with PH.330.802(01)

AS.200.650. Why is thinking hard?

In what ways and why is human cognition limited? This seminar will focus on understanding and explaining the limitations and capabilities of human cognition through deep dives into a number of subtopics. Possible topics include: What is 'intelligence,' does it have quantifiable units and/or a substance-like underpinning. Why does thinking feel hard, why and how do we experience mental effort? What limits visual attention and working memory? Where does insight come from? Why do we forget things? What is creativity? What makes some concepts hard to learn? Why do we misunderstand science? How do we evaluate our own knowledge and understanding?

Area: Social and Behavioral Sciences

AS.200.654. Psychological & Brain Sciences Core Topics A.

This course is designed to introduce students to core topics in psychological and brain sciences. Students will read seminal and contemporary papers in topics that cover the breadth of the field. Graduate students in Psychological and Brain Sciences.

AS.200.655. Psychological & Brain Sciences Core Topics B.

This course is designed to introduce students to core topics in psychological and brain sciences. Students will read seminal and contemporary papers in topics that cover the breadth of the field. Graduate Students in Psychological & Brain Sciences.

AS.200.657. Advanced Statistical Methods.

Topics in applied probability and statistical inference; analysis of variance; experimental design. Intended for graduate students. Recommended Course Background: one statistics course.

Prerequisite(s): Statistics Sequence restriction: students who have completed any of these courses may not register: EN.550.211 OR EN.550.230 OR AS.280.345 OR EN.550.310 OR EN.550.311 OR EN.560.435 OR EN.550.420 OR EN.550.430 OR EN.560.348

Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences

AS.200.658. Advanced Research Design and Analysis.

Second half of graduate statistics sequence, covering complex research design and analysis. Recommended Course Background: AS.200.657. Enrollment limited to seniors by instructor approval and graduate students.

Area: Quantitative and Mathematical Sciences

AS.200.659. Quantitative Methods for Brain Sciences.

Focus on frequently-used quantitative methods used in the study of brain sciences, including gaining conceptual understanding of techniques, analysis and summarization of data, extracting the process underlying a data set, explaining data as a function of variables, data visualization, etc. Enrollment is limited to undergraduate seniors and graduate students with instructor approval. Recommended Course Background: Probability & Statistics, Linear Algebra, MATLAB programming.

Area: Quantitative and Mathematical Sciences

AS.200.661. Topics in Psychological & Brain Sciences.

An introduction to postdoctoral activities (e.g., grant applications, journal article submission, meeting presentations, the politics of psychology and American science) for Ph.D. candidates in psychology.

AS.200.662. Psychological and Brain Sciences: Career Development.**AS.200.670. Advanced Seminar in Vision.**

This seminar will cover advanced topics in vision from the perspectives of several disciplines. Topics include human visual psychophysics, perception and cognition, and computational vision. Graduate students only.

AS.200.680. Psychological & Brain Sciences Seminar.**AS.200.804. Research Seminar: Neurocognitive Aging.**

This seminar will cover advanced topics in neurocognitive aging. Topics will include animal models of memory loss in normal aging and in Alzheimer's disease (AD), including both behavioral and neurobiological findings. Special attention will be given to the relation between such findings and the effects of aging and AD on memory and the brain in man. Similar comparative analysis in other cognitive domains (e.g. attentional processes) will also be considered.

AS.200.805. Research Seminar: Attention and Cognition.**AS.200.808. Readings: Current Research in Cognitive Aging.**

Guided independent readings. The class is designed as a seminar including discussion of primary research articles of cognitive aging. Specific topics include human imaging and animal models of memory, aging, and neurodegenerative disease.

AS.200.810. Research In Psychology.

Students plan and execute original research under guidance of advisers. Results are usually prepared in a form suitable for publication. Graduate students only.

AS.200.811. Research Seminar: Human Performance.**AS.200.813. Research Seminar: Cognitive Development.****AS.200.814. Research Seminar: Cognitive Development.****AS.200.817. Cognitive Lunch.****AS.200.818. Research Seminar: Neuroscience of Decision-making.****AS.200.819. Research Seminar: Vision and Cognition.****AS.200.820. Directed Readings & Research.**

Guided independent readings and research in special fields. Graduate Students only.

AS.200.822. Research seminar: Naturalistic memory and perception.

Research seminar covering topics on human memory and perception in real-world settings.

AS.200.824. Research Seminar: Neural Circuits for Learning.

Research seminar covering topics related to neural circuits for learning.

AS.200.825. Research Seminar: Psychobiology.

Graduate students only.

AS.200.826. Research Seminar: Neuroplasticity and Development.

Graduate Students Only.

AS.200.829. Research Seminar: Neural Circuits & Computations.

Graduate Students Only

AS.200.831. Research Seminar: Neural Systems & Behavior.

Graduate Students Only

AS.200.832. Research Seminar: Neural Circuits & Behavior.

Graduate Students Only.

AS.200.833. Research Seminar: Perception & Mind.

Research seminar covering topics related to perception & mind.

AS.200.834. Research Seminar: Dynamic Scene Perception.

Research seminar covering topics on the behavioral and brain basis of perception in dynamic scenes.

AS.200.835. Research Seminar: Cognitive and Systems Neuroscience.

Research seminar covering topics on cognitive and systems neuroscience.

AS.200.836. Research Seminar: Hippocampal System.

Research seminar covering topics on the behavioral neurophysiology of the hippocampal formation

AS.200.840. Research Seminar: Neural Systems.

Graduate students only. Permission Required.

AS.200.841. Research Seminar: Neural Systems.**AS.200.848. Current Advances in Psychological and Brain Sciences.**

Introduces advanced research topics to graduate students (as well as faculty) through a series of speakers and discussions.

AS.200.849. Teaching Practicum.

All candidates are required to obtain special experience in various aspects of undergraduate teaching. Graduate students only.

AS.200.850. Advanced Teaching Practicum.**Cross Listed Courses****Behavioral Biology****AS.290.510. Comparative Neural Systems and Behavior Research Discussions. 0.5 Credits.**

This course is required concurrently with research in the Comparative Neural Systems Research and Behavior lab. During the scheduled meetings we will discuss scientific papers, policies and procedures, research ethics and other information related to activities in the lab. At the end of the semester, students will present their research in groups. **Prerequisite(s):** You must request Independent Academic Work using the Independent Academic Work form found in Student Self-Service: Registration > Online Forms.

Cognitive Science**AS.050.339. Cognitive Development. 3 Credits.**

This is a survey course in developmental psychology designed for individuals with some basic background in psychology or cognitive science, but little or none in development. The course is strongly theoretically oriented, with emphasis on issues of nature, and development psychology as well as relevant empirical evidence. The principle focus will be early development, i.e., from conception through middle childhood. The course is organized topically, covering biological and prenatal development, perceptual and cognitive development, the nature and development of intelligence, and language learning. Area: Natural Sciences, Social and Behavioral Sciences

AS.050.358. Language & Thought. 3 Credits.

Have you ever wondered about the relationships between language and thought? Philosophers, linguists, psychologists, evolutionary theorists and cognitive scientists have too and this course will survey the current thinking on this matter. Classical papers such as those by Whorf and Sapir, more recent philosophical papers by people such as Fodor and Dennett, and recent empirical work by linguists and psycholinguists on the relationship between language and thinking in development and in adults will be covered. Discussions will focus on the theoretically possible relationships between language and thought and the empirical data that speak to these. Juniors and seniors only. Freshmen and sophomores by permission of instructor only.

Prerequisite(s): AS.050.102 OR AS.050.320 OR AS.050.325 or instructor permission.

Area: Humanities, Natural Sciences, Social and Behavioral Sciences

AS.050.375. Probabilistic Models of the Visual Cortex. 3 Credits.

The course gives an introduction to computational models of the mammalian visual cortex. It covers topics in low-, mid-, and high-level vision. It briefly discusses the relevant evidence from anatomy, electrophysiology, imaging (e.g., fMRI), and psychophysics. It concentrates on mathematical modeling of these phenomena taking into account recent progress in probabilistic models of computer vision and developments in machine learning, such as deep networks. Required Background: Calculus I and experience in a programming language (Python preferred).

Prerequisite(s): AS.110.106 OR AS.110.108

Area: Quantitative and Mathematical Sciences

AS.050.675. Probabilistic Models of the Visual Cortex.

The course gives an introduction to computational models of the mammalian visual cortex. It covers topics in low-, mid-, and high-level vision. It briefly discusses the relevant evidence from anatomy, electrophysiology, imaging (e.g., fMRI), and psychophysics. It concentrates on mathematical modelling of these phenomena taking into account recent progress in probabilistic models of computer vision and developments in machine learning, such as deep networks. Also offered as AS.050.375.

Neuroscience**AS.080.304. Neuroscience Learning and Memory. 3 Credits.**

This course is an advanced survey of the scientific study of learning and memory. Different perspectives will be used to review the science of learning and memory including the cellular-molecular basis of synaptic plasticity, the functional circuitry involved in learning and memory and memory systems in the brain. The course is designed to provide a deep understanding of the issues and current debates in learning and memory research and focuses specifically on animal models of memory and memory impairment. This is an interactive lecture course with a strong emphasis on student participation.

Prerequisite(s): AS.200.141 OR (AS.080.305 AND AS.080.306) OR (AS.020.312 AND AS.020.306) or instructor permission.

Area: Natural Sciences

For current faculty and contact information go to <http://krieger.jhu.edu/publichealth/people/>