

# 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

Members of the department have access to MARCC (<https://www.marcc.jhu.edu/>) high-performance computing systems for computational studies, simulations and data analysis.

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 a host of facilities necessary to conduct modern behavioral neuroscience research, including equipment for behavioral and operant testing, electrophysiology, calcium imaging (2p and endoscopic), opto- and chemogenetics, histology, surgery, neurochemistry, and systems for the analysis of behavioral gestures as well as neural data.

Psychological and Brain Science faculty conduct anatomical and functional MRI studies on human physiology and cognition at the F.M. Kirby Research Center for Functional Brain Imaging at Kennedy Krieger Institute (<https://www.kennedykrieger.org/kirby-research-center> (<https://www.kennedykrieger.org/kirby-research-center/>)).

## Programs

- Psychology, Bachelor of Arts (<https://e-catalogue.jhu.edu/arts-sciences/full-time-residential-programs/degree-programs/psychological-brain-science/psychology-bachelor-arts/>)
- Psychology, Minor (<https://e-catalogue.jhu.edu/arts-sciences/full-time-residential-programs/degree-programs/psychological-brain-science/psychology-minor/>)
- Psychology, PhD (<https://e-catalogue.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.200.110. 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.200.162. Childhood Disorders & Treatments. 3 Credits.

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, Neurodevelopmental Disorders, Learning Disorders and Intellectual Disability. Students will become familiar with various diagnoses, etiologies, and methods of treatment. Note: This course does not count toward the Psychology Major

Area: Social and Behavioral Sciences

### AS.200.199. Psychopathology and Its Development. 1 Credit.

Examine an overview of abnormal psychology (i.e., psychopathology), including its development, etiological/theoretical perspectives, diagnosis, and treatment. Broadly cover the DSM categories, with a focus on understanding the major features of the common disorders and the evidence-based treatment of these conditions.

**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.200.205. 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.

**AS.200.208. Animal Behavior. 3 Credits.**

This course examines how and why animal behaviors are produced across the animal kingdom. Neurobiological, hormonal and developmental mechanisms and adaptive function of behaviors are examined in an evolutionary context. Behaviors include survival, acquiring food, reproduction, communication, parental care, and cooperation. Students will also learn how to develop hypotheses and predictions for scientific questions and interpret graphical results.

**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.200.222. 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.200.250. Behavioral Neuroscience. 3 Credits.**

Behavioral neuroscience is the study of the neural basis of behavior of animals, including humans. This course will introduce the student to this field using a traditional lecture format. We will cover fundamental properties of brain structure and function, mechanisms of psychoactive drug action, and brain mechanisms of perception, homeostatic drives, learning and memory, and cognition. Along the way, we will touch on the biological bases for social interactions, as well as for behavioral and mental illnesses, such as addiction, depression and schizophrenia. A key focus will be understanding how behavioral neuroscientific research, past and present, leads to knowledge in this area.  
Area: Natural 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.200.304. 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). **Prerequisites:** AS.200.202 OR AS.200.212

**Prerequisite(s):** AS.200.202 OR AS.200.212

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 & Minors or with instructor approval. **Prerequisite:** AS.200.212

**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.200.312. Substance Use and Mental Health. 3 Credits.**

This course focuses on the intersection of substance use and mental health. Topics will include substance use disorders, the co-morbidity of substance use disorders and other mental health diagnoses, and substance use as a form of self-medication for mental health symptoms. We will explore abuse of substances including synthetic drugs, "street" drugs, and commonly abused prescription medications. We will review etiological factors, including psychological, neurobiological, genetic, and trauma-related factors, as well as evidenced-based treatments. We will also explore controversies about the diagnosis and conceptual models of substance use disorders and addiction and controversial treatments, such as methadone and suboxone. Psychology majors & minors or by permission of the instructor. **Pre-requisite:** AS.200.212 Abnormal Psychology, or by instructor permission.

**Prerequisite(s):** AS.200.212

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.200.317. 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 and Psychology minors.

**Prerequisite(s):** AS.200.133

Area: 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, feeding disorders, and behavioral disorders. Restricted to Junior & Senior Psychology Majors & Minors, or permission of the instructor.

**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). Recommended Course Background: at least 1 course in introductory psychology, developmental psychology, social psychology and/or clinical psychology.

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

**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.200.330. Human and Machine Intelligence. 3 Credits.**

Description: The class will discuss original papers in a variety of papers and book chapters on the following topics.1. What is intelligence?2. Origin and evolution of intelligence?3. Human brain and intelligence4. Machine intelligence5. Neural networkRecommended course background: neurobiology.

Area: Natural 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 cerebral cortex. We will discuss, present, and write about primary literature in the area of theoretical neuroscience. The 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 supervision or reinforcement signals? How is the flow of information between brain regions regulated? How can distinct cortical representations be "bound" into joint representations? Calculus 1 or equivalent is required. Higher-level mathematics and programming experience are not required, but students should be willing to engage with computational concepts. Recommended Course Background: AS.200.110 OR AS.050.203 OR AS.200.211 OR AS.080.105 OR other introductory coursework in cognitive & neural sciences.

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

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.200.337. Origins of the Social Mind. 3 Credits.**

Humans possess remarkable capacities for morality, politics, and culture. But where do these capacities come from and what cognitive mechanisms support them? In this seminar, we will take comparative and developmental perspectives to understand the origins of the social mind. We'll explore how nonhuman animals, especially primates, represent and navigate their social worlds, and what makes the human mind unique. We'll also explore the earliest manifestations of social intelligence that are present in human infancy, allowing babies to richly experience the social world long before they develop language. We'll cover a range of topics, such as the abilities to remember other individuals and keep track of their social relationships and social groups, theory of mind, self-awareness, precursors of politics and morality, and the question of whether animals have culture. Enrollment limited to Junior & Senior Psychology, Neuroscience or Behavioral Biology majors/minors. Prerequisite: 200.132 Intro to Dev. Psych OR 200.133 Intro Social Psych OR 200.110 Intro Cog. Psych OR 200.141 Foundations of BBC OR instructor approval

**Prerequisite(s):** AS.200.132 OR AS.200.133 OR AS.200.110 OR AS.200.141

Area: Natural Sciences, Social and Behavioral Sciences

**AS.200.340. Diversity in Psychology. 3 Credits.**

This course presents an overview of the nature of human diversity in psychology and fosters the critical examination of major diversity issues in psychology. Conceptual, historical, philosophical, and theoretical issues and empirical research are reviewed. Students develop sensitivity and critical thinking regarding issues in psychology research and professional practice that may be influenced by factors such as age, generational influence, ethnicity, race, religion and spirituality, gender, socioeconomic class, sexual orientation, national origin, disability and other cultural diversity topics. Current issues will be highlighted. Students will also be introduced to public health paradigms regarding the changing roles of psychology researchers and practitioners. This course is limited to Senior Psychology Majors and Minors. Junior Psychology Majors and Minors can request to enroll by instructor permission.

Area: Social and Behavioral Sciences

**AS.200.344. Behavioral Endocrinology. 3 Credits.**

This course examines both the evolution and mechanisms of hormonal effects on behavior across animals, including humans. Topics will include the effects of hormones on sexual differentiation, reproductive behavior, parental behavior, stress and social behavior. Additionally, this course emphasizes developing skills in hypothesis testing and critically assessing the scientific literature. 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.200.358. Advanced Research Design and Analysis. 3 Credits.**

Second half of statistics sequence, covering complex research design and analysis. Recommended Course Background: AS.200.357. Enrollment limited to seniors by instructor approval.

**Prerequisite(s):** AS.200.357

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

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.

Recommended Course Background in addition to pre-requisite AS.080.305: AS.080.306 OR AS.050.203 OR AS.080.250

**Prerequisite(s):** AS.080.305

Area: Natural Sciences, Social and Behavioral Sciences

**AS.200.374. Happiness and Psychological Well-Being. 3 Credits.**

This course will cover advances in the field of research on positive psychology, happiness, and well-being, including perspectives on motivational and emotional wellness, cognitive processes, social-interpersonal dynamics, and sociocultural variables. We will explore topics including hobbies and leisure, mindfulness and meditation, money/income, ethics and religion, social media, marriage, friendship, economic institutions, school, the workplace, and more. Coursework includes reflection exercises, discussions, research proposals, fact-checking analyses, and presentations. Restricted to Senior & Junior Psychology majors & minors. Prerequisite: (AS.200.133 OR AS.200.101) AND (AS.200.212 OR 200.382) AND 200.222 or by instructor permission.

**Prerequisite(s):** (AS.200.133 OR AS.200.101) AND (AS.200.212 OR AS.200.382) AND AS.200.222

Area: 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.200.380. 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. Instructor permission required to enroll.

**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.200.388. 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.200.431. Neural Systems & Behavior. 1 Credit.**

Discussion of research activities in the Neural Systems and Behavior Lab. Discussion of research activities in the Neural Systems and Behavior Lab. This course is only available for undergraduate students currently working on research projects in the Moss Lab.

Area: Natural Sciences, Social and Behavioral Sciences

**AS.200.450. Undergraduate Teaching Assistant in Psychology. 1 - 3 Credits.**

Qualified students can serve as undergraduate Teaching Assistants for psychology courses they have already taken at Hopkins (by faculty instructor invitation only). Each individual faculty instructor will determine TA responsibilities based upon departmental policy. Upon invitation, potential Teaching Assistants should forward the instructor invitation to the co-Director of Undergraduate Studies (Dr. Drigotas) and make a request in SIS to add the course using the instructor's section number (e.g., 200.450 section 2). Dr. Drigotas will be approving requests in SIS.

Area: Social and Behavioral Sciences

**AS.200.515. Psychological Research. 1 - 3 Credits.**

The student chooses a 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.200.525. Psychology Internship. 1 - 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.200.530. Independent Study in Psychology. 1 - 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.200.545. Psychological Readings. 1 - 3 Credits.**

Psychological Readings represents an in-depth analysis of a psychological subject area not typically covered in departmental course offerings. Students must have the support of a full time faculty sponsor and work with them to plan a curated set of readings and activities for the semester.

**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.200.617. 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.200.650. 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.**

Focuses on frequently used quantitative methods in the study of brain sciences. Course goals include gaining conceptual understanding of analysis techniques, application of techniques to datasets, and learning the use of MATLAB. Topics will include dimensionality reduction, information theory, clustering and classification, optimization and model selection, and frequency domain methods. Enrollment is limited to graduate students and undergraduate seniors; seniors must receive permission from the instructor to enroll. Recommended (but not required) 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.200.800. Psychology Research - Summer.****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.200.817. Cognitive Seminar.****AS.200.825. Biopsychology Seminar.**

Graduate students only.

**AS.200.830. Research Seminar in Psychological & Brain Sciences.**

TBA

**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.****AS.200.860. Dissertation Preparation.**

TBA

**Cross Listed Courses****Behavioral Biology****AS.290.400. 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. This course is only open to students doing research in the Neural Systems and Behavior Lab.

**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.

**First Year Seminars****AS.001.109. FYS: Why'd Your Brain Sign You up for This?. 3 Credits.**

This First-Year Seminar will explore the neuroscience of choice. In addition to exploring the neurobiology of choice, we will dabble with philosophical ideas of free will and determinism. We will also touch on questions related to culpability. For example, are people who break the law but suffer from brain damage responsible for their actions? Sound interesting? Well, why stop there? Let's sit back, eat some popcorn and take a look at how popular culture depicts the neuroscience of choice in the movies. Yes, with your help, we can do it all – but will you choose to???

Area: Natural Sciences, Social and Behavioral Sciences

**AS.001.115. FYS: Illusions, Delusions, and Other Confusions. 3 Credits.**

Most people think the strongest kind of evidence in a criminal case is a confident eyewitness. Most students think re-reading textbook materials or class notes is the best way to prepare for an exam. And all too many people think that measles vaccines cause autism. All three of these ideas are wrong. In this First-Year Seminar, we will explore what modern psychology has uncovered about how our intuitions concerning human nature deceive us, and lead to incorrect ideas such as the ones just mentioned. We will discuss a wide variety of topics including "the attention economy," groupthink, and subliminal perception.

Area: Social and Behavioral Sciences



**AS.001.130. FYS: Evolutionary Psychology. 1 Credit.**

In this unique, 1-credit First-Year Seminar, we discuss evolutionary psychology—the idea that the mind can be understood as an adaptation to our ancestral environment by means of natural selection. Topics range from nature vs. nurture and freewill vs. determinism to the exploration of how evolutionary principles speak to broad social issues such as sexuality, gender, social class, and violence.

Area: Natural Sciences, Social and Behavioral Sciences

**AS.001.165. FYS: Biology in Deep Time. 3 Credits.**

This First-Year Seminar will explore seminal ideas in macroevolutionary theory through both classic and cutting-edge studies. Topics would include the relationship between evolution and development, how fossils shape our understanding of biological systems, and the logical basis of evolutionary inference. Students will also gain an appreciation for the historical development of these ideas and their application in modern science and beyond.

Area: Natural Sciences, Social and Behavioral Sciences

**AS.001.168. FYS: The Psychology of Mass Politics in the U.S.. 3 Credits.**

Taught during the election season of 2022, this First-Year Seminar looks at the deeper psychological motivations of the American electorate. We begin by discussing the meaning of democracy and establishing a common understanding of American democracy specifically, placing the current moment into historical and international context. We then gradually dismantle the "folk theory" of democracy that assumes all voters are rational and economically-minded. Instead, we apply theories from social psychology to understand some essential questions about voter behavior. Why do people vote? How do they understand politics? How are their feelings and judgments affected by their own identities, biases, information sources, and by the messages they hear from leaders? Why have Americans grown so polarized? What role do racial and gender-based prejudice play? Is American politics headed toward a more violent future? We use evidence-based research from political science, sociology, and psychology to answer these questions.

Area: Humanities, Social and Behavioral Sciences

**History of Science, Medicine, and Technology****AS.140.336. History of Mental Healthcare in the United States. 3 Credits.**

In recent decades, much has been done in the United States to destigmatize mental illness and incorporate psychiatric services into broader systems of healthcare and welfare. As clinicians, policy makers, social scientists, activists, and other stakeholders have collaborated to promote mental health and reintegrate people with behavioral disorders into society, they have often contrasted their efforts with those made in the past, portraying community-based approaches as more efficacious and humane. Narratives like these, however, deemphasize many important continuities in the history of American psychiatry. In this discussion-based course, students will explore how concerns about citizenship and social control have shaped the organization and provision of mental healthcare in the United States from the early nineteenth century to the present day. They will also complete various assignments designed to hone their ability to evaluate historical arguments, conduct independent and collaborative research on primary sources, and communicate the results of their scholarship to professional and lay audiences.

Area: Humanities, Social and Behavioral Sciences

**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

**AS.080.308. Neuroeconomics. 3 Credits.**

Every day decisions often require us to weigh the costs and benefits of engaging in a particular course of action in order to obtain some expected outcome. Unfortunately, we often lack the information necessary to obtain our desired goal with complete certainty. Economists have long been interested in understanding human decision-making under these circumstances. In parallel, neuroscientists have made great strides at describing the underlying neural basis of simple decision-making. However, despite much progress in both fields, our understanding of how the brain makes decisions is incomplete. In order to strengthen and further research in both fields, the interdisciplinary field of Neuroeconomics arose. This course will survey the field of Neuroeconomics focusing on theoretical concepts developed by economists and the role these theories are playing in guiding current experimental neuroscience.

**Prerequisite(s):** AS.080.306 OR AS.200.141 OR AS.020.312

Area: Natural Sciences

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