

# 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 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/>).

## 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).

Distribution Area: Natural Sciences, Social and Behavioral Sciences  
AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

### 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.

Distribution Area: Natural Sciences, Social and Behavioral Sciences  
AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4)

EN Foundational Abilities: Engagement with Society (FA4)

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

How does a newborn's mind become an adult's mind, like yours? This course will introduce students to the foundational theories and research on how children's minds, brains, and behaviors develop, from birth through adolescence. Students will actively engage with a broad range of topics, from learning language to theory of mind, and consider the implications of what they learn for real-world issues like education, parenting, and policymaking.

Distribution Area: Social and Behavioral Sciences  
AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4)

EN Foundational Abilities: Engagement with Society (FA4)

### 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.

Distribution Area: Social and Behavioral Sciences  
AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

### 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.

Distribution Area: Natural Sciences, Social and Behavioral Sciences  
AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**AS.200.159. Evolutionary Psychology. 1 Credit.**

In this 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. Note: This course does not count towards the Psychology major.

Distribution Area: Natural Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2)

**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

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2)

**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 Foundational Abilities: Science and Data (FA2)

**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”.

Distribution Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Writing and Communication (FA1), Ethics and Foundations (FA5), Projects and Methods (FA6)

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):** AS.200.101 OR AS.200.110 OR AS.200.132 OR AS.200.133 OR AS.200.141 OR AS.200.212

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**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.

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2)

**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.

Distribution Area: Natural Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**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.

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4)

EN Foundational Abilities: Engagement with Society (FA4)

**AS.200.210. Thriving through College: A Developmental and Positive Psychology Perspective. 3 Credits.**

Students will develop a working knowledge of the characteristics that have been identified through research as being important in effective college transitions. Using practical and theoretical objectives, the course will explore the relevance of developmental and positive psychological processes as they apply in academic and social settings and provide theory-based research approaches for thriving in college and beyond. The developmental period of emerging adulthood (ages 18-25) will be discussed with a primary focus on cognitive, moral, and identity development theories. Students also will gain an understanding of what contributes to thriving and how to build the enabling conditions of a life worth living. The developmental theories and central concepts in positive psychology will provide students with a foundation to navigate college academic expectations and equip them with the attitudes, skills, and resources needed to function optimally and excel in college.

AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4)

EN Foundational Abilities: Engagement with Society (FA4)

**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.

Distribution Area: Natural Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2)

**AS.200.212. Psychopathology. 3 Credits.**

A survey of the major syndromes of psychological disorders. Research and theory about the mechanisms, development, and diagnosis of psychopathology are emphasized. This course was previously listed as 'Abnormal Psychology'.

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**AS.200.213. The Psychology of Evil. 3 Credits.**

Why is there evil in the world? Are some born evil, or do social, environmental and cultural forces create evil? What makes otherwise good people do evil things? The scientific study of evil epitomizes the fundamental challenge that psychology faces in dissecting the role of biology (nature) and the social context (nurture). Credit earned through this course counts toward the 120-credit degree requirement but does not count towards the Psychology major/minor. Students must be aged 18 or older to enroll, due to the sensitive nature of the material in this course (e.g., research on violence).

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4)

EN Foundational Abilities: Engagement with Society (FA4)

**AS.200.215. The Mind and Brain: Introduction to Cognition, Attention, and Memory. 3 Credits.**

Why do we 'not see' things right in front of us? What makes some memories crystal clear and others 'hazy'? Why does hurting a fake hand cause you physical pain? How can we recognize thousands of human faces? In this course we will learn about the cognitive processes—such as attention, memory and perception—that help us answer these kinds of questions. Through a combination of psychology and biology research, students will explore how the mind and brain give rise to how we interact with and experience the world. This course is designed for students who are interested in an introduction to psychology, biology, and neuroscience. Open to undergraduates and pre-college students.

Distribution Area: Natural Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2)

**AS.200.216. BioPsychology. 3 Credits.**

Dive into the world of behavioral neuroscience and discover how the brain gives rise to thought, emotion, and perception. This introductory course explores how the brain's structure, electrical activity, and chemical signals shape everything from memory, motivation and decision-making. We'll break down complex topics like neurotransmitters and neural circuits, showing how they connect to everyday experiences like learning, emotions and sleep. As you move through the course, you'll learn how we study the biology underlying behavior using techniques like neuroimaging. You'll also see how these methods are applied in the real world — powering innovations in mental health, neurotechnology, marketing, and design. Along the way, you'll complete weekly quizzes to reinforce your understanding, and apply your knowledge through short assignments. The course is open to undergraduates and high school students.

Distribution Area: Natural Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2)

**AS.200.219. Political Psychology. 3 Credits.**

This course will focus on the psychological underpinnings of political variables. Topics include voter decisions, ideology, persuasion, party identification, polarization, social media, misinformation, conspiracy theories, well-being, as well as the contribution of demographic variables such as religious beliefs, race, gender, and age. The course will incorporate relevant literature from research on personality traits, morals/ethics, happiness & mental health, and media studies. Coursework includes exams, activities, and small writing assignments.

**Prerequisite(s):** Students who have taken AS.200.319 cannot take AS.200.219. Students may only receive credit for AS.200.219 OR AS.200.319.

AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4)

**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.

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**AS.200.238. Primate Minds. 3 Credits.**

Humans are unique in many ways but we are also members of the Primate order. As a result, we share rich foundations of our psychology with the other living primates, foundations we inherited from our common evolutionary ancestors. This course will explore the minds and mental lives of our closest primate relatives. What does the world look like from the perspective of a chimpanzee, or a lemur? How do they think, reason, and make decisions? How has their cognition evolved? We'll cover basic aspects of primate biology, sociality, evolution, and cognitive representation, and then survey the many foundations of human thought that we share with other primates—from memory and planning to social intelligence and physical problem-solving. Psychology, behavioral biology & cog sci majors are preferred, but other majors are welcome.

**Prerequisite(s):** AS.200.141 OR AS.200.101 OR AS.200.110 OR AS.200.132 OR AS.200.133 OR AS.050.102 OR AS.050.105 OR AS.150.245 OR Instructor Approval.

Distribution Area: Natural Sciences, Social and Behavioral Sciences  
AS Foundational Abilities: Writing and Communication (FA1), Science and Data (FA2), Ethics and Foundations (FA5)  
Writing Intensive

**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.

Distribution Area: Social and Behavioral Sciences  
AS Foundational Abilities: Science and Data (FA2)

**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.

Distribution Area: Natural Sciences  
AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**AS.200.300. 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)

Distribution Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Writing and Communication (FA1), Science and Data (FA2), Projects and Methods (FA6)  
Writing Intensive

**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.

Distribution Area: Humanities, Social and Behavioral Sciences  
AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4)

EN Foundational Abilities: Engagement with Society (FA4)

**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.080.306 or instructor permission

Distribution Area: Natural Sciences

AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4)

EN Foundational Abilities: Engagement with Society (FA4)

**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

Distribution Area: Natural Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Writing and Communication (FA1), Science and Data (FA2), Ethics and Foundations (FA5)

Writing Intensive

**AS.200.307. Medical Psychology. 3 Credits.**

Medical, or Health, Psychology is a specialty area of psychology that seeks to understand how biological, psychological, and social factors influence health, as well as the course and treatment of physical illness.

Students will learn how health psychologists and their colleagues in related disciplines (e.g., public health, medicine, sociology, etc.) have applied psychological theories, research, and techniques to health promotion, disease prevention, and in clinical practice with medical patients. Enrollment limited to Junior & Senior Psychology majors and minors with second preference given to Public Health Studies majors or with instructor approval.

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

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4)

EN Foundational Abilities: Engagement with Society (FA4)

**AS.200.308. Fundamentals of Biopsychology. 3 Credits.**

The course covers foundational concepts and methods in neurobiology and cognitive neuroscience.

Distribution Area: Natural Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2)

**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

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and

Foundations (FA5)

**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

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**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. Enrollment limited to Juniors and Seniors. 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. Some basic experience with computer programming (any language) is recommended, although not required.

Distribution Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Projects and Methods (FA6)

**AS.200.316. Mind Reading 101: The Psychology of Mental State Inference. 3 Credits.**

Understanding the minds of other people, or "mind-reading", is among our most important capacities as a social species. Explaining peoples' actions in terms of underlying mental states such as beliefs, desires, preferences, and so on often feels obvious, yet at the same time, misunderstandings about the mental lives of others pervade our daily life. How do we form intuitions about what others are thinking and feeling from nonverbal interactions, regardless of whether these intuitions wind up being correct? This course will provide a brief overview of the scientific literature on mind reading and discuss the major theoretical questions that guide ongoing research.

AS Foundational Abilities: Science and Data (FA2)

**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

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4)

EN Foundational Abilities: Engagement with Society (FA4)

**AS.200.319. Political Psychology. 3 Credits.**

This course will focus on the psychological underpinnings of political variables. Topics include voter decisions, persuasion, party identification, polarization, misinformation, as well as the contribution of variables such as religious beliefs, race, gender, and age. The course will incorporate relevant literature from research on personality traits, morals/ethics, happiness & mental health, and media studies. Coursework includes reading and summarizing the scientific literature on these topics, in-class presentations, research proposals, quizzes, and essays. Course Prerequisites: Students must either take Introduction to Psychology AS.200.101 or Social Psychology AS.200.133 as a prerequisite. Course is restricted to juniors/seniors who are psychology majors/minors.

**Prerequisite(s):** AS.200.101 OR AS.200.133

Distribution Area: Humanities, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Democracy (FA4.1)

EN Foundational Abilities: Engagement with Society (FA4)

**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

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4)

EN Foundational Abilities: Engagement with Society (FA4)

**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 OR AS.080.306

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

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

Social media is a ubiquitous feature of modern social life. By interfacing with technology, we can communicate with one another, express our views, learn new information, pursue professional and recreational goals, and even earn a living. As a scientific community and through personal experience, we know a great deal about the various ways in which social media are used, the benefits and drawbacks, and how they shape our decisions and lifestyles. The goal of this class is to explore social media use through multiple psychological lenses. Through weekly student-led discussions and readings, it will accomplish 3 aims: 1) applying psychology of personality, identity, motivation, communication, etc. to social media (e.g., self-presentation, intergroup dynamics, interpersonal relationships), 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 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.

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4), Democracy (FA4.1)

EN Foundational Abilities: Engagement with Society (FA4)

**AS.200.325. Social Attraction and Relationship Development. 3 Credits.**

This course will cover theories and research on social attraction, both in the context of romantic and platonic relationships (friendships), at various stages of development including adolescence and later adulthood. This includes a focus on topics such as first impressions, courtship, internet applications, rejection, para-social relationships, and more. We will draw on evolutionary theories, sociocultural and situational forces, personality traits, family/peer influence, and incorporate multidisciplinary research from fields spanning psychology, communication, and sociology. Coursework includes critiques of existing literature, discussions, research proposals, and presentations.

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

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**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  
Distribution Area: Social and Behavioral Sciences  
AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4), Democracy (FA4.1)

**AS.200.328. Methods for Studying Infant Minds. 3 Credits.**

When babies look out into the world, what do they see and understand: shapes and colors, people and objects, or mental and physical states? These questions have motivated work in psychology, philosophy, neuroscience, and artificial intelligence since the founding of these fields - but how do we go about answering them? In this seminar, we will read primary research articles from the field of infant cognitive development. We will engage with the hypotheses, methods, and inferences of this work, and learn about the strengths and limitations of the methods we have to answer these questions. We will also learn about open science tools that make our work more robust and likely to produce true answers, and use them to propose and plan novel research. This course is intended for upper-level undergraduate students. Prerequisites: AS.200.132 Introduction to Developmental Psychology (or instructor permission). Helpful but not required: AS.200.200 Research Methods Psychology; AS.200.201 Design and Analysis for Psychology. Enrollment restricted to Psychology majors and minors.

**Prerequisite(s):** AS.200.132 or Instructor Approval

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4)

EN Foundational Abilities: Engagement with Society (FA4)

**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 Python. 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.

Distribution Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2)

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

The class will discuss a variety of original papers and book chapters on the following topics: 1. What is intelligence? 2. Origin and evolution of intelligence? 3. Human brain and intelligence? 4. Machine intelligence? 5. Neural network. Recommended course background: neurobiology.

Distribution Area: Natural Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**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 human brain. We will discuss, present, and write about primary literature in the areas of theoretical and computational neuroscience, with connections to machine learning and artificial intelligence. Principles to be explored will include: hierarchy; normalization; pattern completion; prediction; gradient-based learning; and compositional representation. We will consider the motivation for each of these computational principles; we will ask how successfully they organize the empirical data about our brains; and we will explore whether they are also observed in machine intelligence. Specific questions include: What are the functional benefits of a hierarchical organization in the human cerebral cortex? Does the neocortex express repeated functional motifs? How and why is pattern completion implemented in the human brain? Which kinds of learning can occur without supervision or reinforcement signals? In what ways are human learning and machine learning fundamentally distinct? Cal 1; Programming is not required, but students should be willing to engage with computational concepts. Course Prerequisites: a) AS.110.106 / Calculus I OR AS.110.108 Calculus I b) AS.050.101 / Cognition OR AS.200.211 / Sensation & Perception OR AS.080.105 / Introduction to Neuroscience OR AS.050.203 OR instructor permission.

**Prerequisite(s):** (AS.110.106 OR AS.110.108) OR (AS.050.101 OR AS.200.211 OR AS.080.105 OR AS.050.203)

Distribution Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2)

**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

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4)

EN Foundational Abilities: Engagement with Society (FA4)

**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.

Distribution Area: Humanities, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2)

**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, Behavioral Biology, Cognitive Science, Philosophy, or 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 050.102 Language and Mind OR 050.105 Intro Cog. Neuropsych OR instructor approval.

**Prerequisite(s):** AS.200.110 OR AS.200.132 OR AS.200.133 OR AS.200.141 OR AS.050.102 OR AS.050.105

Distribution Area: Natural Sciences, Social and Behavioral Sciences  
AS Foundational Abilities: Science and Data (FA2), Projects and Methods (FA6)

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

Diversity in psychology explores the ways in which our judgments, cognitions, and behaviors shape and influence our understanding of difference, power, identity, and social action. Grounded in empirical research, narratives, and theoretical frameworks, students in this advanced seminar will develop sensitivity and critical thinking regarding current issues, professional practices, and public health paradigms that may be influenced by factors such as age, generational influence, ethnicity, race, religion and spirituality, gender, socioeconomic status, sexual orientation, national origin, and disability. This seminar is discussion based and experiential in nature and requires students to actively reflect, demonstrate, and integrate knowledge and awareness developed throughout the course on introspective and interpersonal levels. This course is limited to Senior Psychology Majors and Minors, or instructor permission.

Distribution Area: Social and Behavioral Sciences  
AS Foundational Abilities: Citizens and Society (FA4), Ethics and Foundations (FA5)  
EN Foundational Abilities: Engagement with Society (FA4)

**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. Course Recommendations: Introductory or advanced courses in biology and an introductory course in neuroscience (e.g. Foundations of Brain Behavior and Cognition) are highly recommended for success in this course.

Distribution Area: Natural Sciences, Social and Behavioral Sciences  
AS Foundational Abilities: Science and Data (FA2)

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

This course will explore the neurobiological bases of motivated behavior through study of original research articles and scholarly reviews, with a focus on mammalian model systems. We will discuss neural systems underlying innate motivated behaviors, as 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. Students should have completed an introductory course or courses in neuroscience; a background in basic neuroscience, including neural/synaptic transmission is required.

Distribution Area: Natural Sciences

AS Foundational Abilities: Science and Data (FA2)

**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

Distribution Area: Natural Sciences, Social and Behavioral Sciences  
AS Foundational Abilities: Science and Data (FA2)

**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: 200.222 or by instructor permission.

**Prerequisite(s):** AS.200.222

Distribution Area: Social and Behavioral Sciences  
AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**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 states. 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.200.141 OR AS.080.306 OR (AS.020.306 AND AS.020.312)

Distribution Area: Natural Sciences, Social and Behavioral Sciences  
AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**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 Juniors, Seniors or by instructor approval. Prerequisite: AS.200.141 OR AS.080.305.

**Prerequisite(s):** AS.200.141 OR AS.080.305

Distribution Area: Natural Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**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.050.203 OR AS.050.312

Distribution Area: Natural Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4)

EN Foundational Abilities: Engagement with Society (FA4)

**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.

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Writing and Communication (FA1), Science and Data (FA2), Ethics and Foundations (FA5)

Writing Intensive

**AS.200.385. Human Neuroplasticity. 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):** Students who have taken AS.200.363 are not eligible to take AS.200.385.; AS.200.141 OR AS.050.105 OR AS.080.105 OR AS.050.203 OR AS.080.306

Distribution Area: Natural Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Writing and Communication (FA1), Science and Data (FA2), Citizens and Society (FA4)

EN Foundational Abilities: Engagement with Society (FA4)

**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

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Citizens and Society (FA4)

EN Foundational Abilities: Engagement with Society (FA4)

**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.

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**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.

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**AS.200.403. Careers in Psychology - Juniors. 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.

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**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.

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**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.

Distribution Area: Natural Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2)

**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.

Distribution Area: Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**AS.200.457. Advanced Statistical Methods. 3 Credits.**

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

**Prerequisite(s):** AS.200.200 AND AS.200.201

Distribution Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Writing and Communication (FA1), Science and Data (FA2)

Writing Intensive

**AS.200.458. 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

Distribution Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2)

**AS.200.459. Quantitative Methods for Brain Sciences. 3 Credits.**

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.

AS Foundational Abilities: Science and Data (FA2)

**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 Customized Academic Learning using the Customized Academic Learning form found in Student Self-Service: Registration > Online Forms.

AS Foundational Abilities: Science and Data (FA2), Projects and Methods (FA6)

**AS.200.525. Psychology Internship. 1 Credit.**

Practical work experience (e.g., clinical internships) that includes readings and a paper that 1) summarizes the research literature associated with the focus of the internship and 2) reflects upon the internship experience, and must be sponsored by a full-time departmental faculty member. S/U grading only.

**Prerequisite(s):** You must request Customized Academic Learning using the Customized Academic Learning form found in Student Self-Service: Registration > Online Forms.

AS Foundational Abilities: Science and Data (FA2), Projects and Methods (FA6)

**AS.200.530. Independent Study in Psychology. 1 - 3 Credits.**

Independent study experience paired with an academic internship, includes readings and a paper that 1) summarizes the research literature associated with the focus of the internship and 2) reflects upon the internship experience, and must be sponsored by a full-time departmental faculty member. S/U grading only.

**Prerequisite(s):** You must request Customized Academic Learning using the Customized Academic Learning form found in Student Self-Service: Registration > Online Forms.

AS Foundational Abilities: Science and Data (FA2), Projects and Methods (FA6)

**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 Customized Academic Learning using the Customized Academic Learning form found in Student Self-Service: Registration > Online Forms.

AS Foundational Abilities: Science and Data (FA2), Projects and Methods (FA6)

**AS.200.613. Fundamentals of Biopsychology. 3 Credits.**

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. Distribution Area: Natural Sciences, Social and Behavioral Sciences

**AS.200.617. Fundamentals of Cognitive Psychology. 3 Credits.**

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.200.618. Seminar in Semantics & Psychology. 1 Credit.**

This course investigates the interactions between semantics & psychology. Graduate Students only.

**AS.200.619. Seminar 2 in Semantics & Psychology. 1 Credit.**

This course investigates interactions between semantics & psychology.

**AS.200.654. Psychological & Brain Sciences Core Topics A. 2 Credits.**

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. 3 Credits.**

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. 3 Credits.**

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.553.211 OR EN.553.230 OR AS.280.345 OR EN.553.310 OR EN.553.311 OR EN.560.435 OR EN.553.420 OR EN.553.430 OR EN.560.348

Distribution Area: Quantitative and Mathematical Sciences, Social and Behavioral Sciences

**AS.200.658. Advanced Research Design and Analysis. 3 Credits.**

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.

Distribution Area: Quantitative and Mathematical Sciences

**AS.200.659. Quantitative Methods for Brain Sciences. 3 Credits.**

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.

Distribution Area: Quantitative and Mathematical Sciences

**AS.200.661. Topics in Psychological & Brain Sciences. 1 Credit.**

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. 1 Credit.**

Professional development seminar for graduate students in Psychological & Brain Sciences. Topics include teaching, preparing a curriculum vita, types of employment, finding a job, writing and reviewing scientific papers, presenting work at professional meetings, preparing grant proposals, professional ethics, and care of animal and human subjects. Graduate students only.

**AS.200.670. Advanced Seminar in Vision. 1 Credit.**

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.200.675. Advanced Seminar in Psychological Science. 1 Credit.**

In this seminar, we meet as a group to discuss current issues in our research, foundational topics in the study of the mind, as well as the challenges that arise in doing academic science.

**AS.200.680. Psychological & Brain Sciences Seminar. 1 Credit.**

Research Seminar on current research related to Psychological and Brain Science, presented by graduate students and post-doctoral fellows. Graduate students only.

**AS.200.800. Psychology Research - Summer. 9 Credits.**

Graduate students only.

**AS.200.808. Readings: Current Research in Cognitive Aging. 1 Credit.**

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. 2 Credits.**

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. 1 Credit.**

Advanced seminar covering topics related to cognitive research. Graduate Students only.

**AS.200.825. Biopsychology Seminar. 1 Credit.**

Graduate students only.

**AS.200.830. Research Seminar in Psychological & Brain Sciences. 2 Credits.**

Research seminar covering current issues and ongoing research in cognition & biopsychology. Graduate students only.

**AS.200.848. Current Advances in Psychological and Brain Sciences. 1 Credit.**

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

**AS.200.849. Teaching Practicum. 2 Credits.**

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

**AS.200.850. Advanced Teaching Practicum. 2 Credits.**

All PhD candidates are required to obtain advanced experience in various aspects of undergraduate teaching. This course is required for Teaching Assistants in order to satisfy graduate degree TA requirements. Graduate students only.

**AS.200.860. Dissertation Preparation. 10 Credits.**

Preparation for the writing of research results into a final PhD dissertation form and other research publications. Graduate students only.

**AS.200.870. Advanced Dissertation Preparation. 14 Credits.**

Advanced preparation for the writing of research results into a final PhD dissertation form and other research publications. Graduate students only.

## Cross Listed Courses

### Behavioral Biology

**AS.290.307. Evolution & Human Behavior. 3 Credits.**

The course examines human behavior from an evolutionary perspective. Lectures and seminar-based discussion of the primary literature will cover some of the major approaches and areas of study within the fields of (1) evolutionary anthropology, (2) evolutionary psychology, (3) human behavioral ecology, and (4) evolutionary medicine.

**Prerequisite(s):** AS.290.101 OR AS.200.208

Distribution Area: Natural Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Science and Data (FA2)

EN Foundational Abilities: Engagement with Society (FA4)

**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.

AS Foundational Abilities: Science and Data (FA2)

**Cognitive Science****AS.050.239. 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. Also offered as AS.050.639.

Distribution Area: Natural Sciences, Social and Behavioral Sciences  
AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

**AS.050.312. Cognitive Neuroimaging Methods in High-Level Vision. 3 Credits.**

This course is an advanced seminar and research practicum course. It will provide the opportunity to learn about fMRI methods used in the field of vision science and for students to have hands-on experience to develop, design and analyze a research study on topics in the cognitive neuroscience field of high-level vision. In the first part of the course students will read recent fMRI journal papers and learn about common fMRI designs and analysis methods; in the second part of the course students will conduct a research study to address a research question developed from readings. Students are expected to write a paper in a short journal article format at the end of the course and to present their results in front of the class. Research topics will vary but with special focus on topics in high-level visual processing.

**Prerequisite(s):** AS.050.105 OR AS.050.116 OR AS.050.203 OR AS.050.315 OR AS.050.332 OR AS.200.110

Distribution Area: Natural Sciences, Social and Behavioral Sciences  
AS Foundational Abilities: Science and Data (FA2), Projects and Methods (FA6)

**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.

Distribution Area: Humanities, Natural Sciences, Social and Behavioral Sciences

AS Foundational Abilities: Writing and Communication (FA1), Science and Data (FA2), Ethics and Foundations (FA5)

Writing Intensive

**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. Also offered as EN.601.485. Required Background: Calculus I and experience in a programming language (Python preferred).

**Prerequisite(s):** Students who are currently enrolled in, or have already taken EN.601.485/EN.601.685/AS.050.675, are not eligible to take AS.050.375.; AS.110.106 OR AS.110.108

Distribution Area: Quantitative and Mathematical Sciences

AS Foundational Abilities: Science and Data (FA2)

**AS.050.675. 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. Also offered as EN.601.685. Required Background: Calculus I and experience in a programming language (Python preferred).

**Prerequisite(s):** Students who are currently enrolled in, or have already taken EN.601.485/EN.601.685/AS.050.375, are not eligible to take AS.050.675.

**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???

**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.

**AS.001.130. FYS: Evolutionary Psychology. 3 Credits.**

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.

Distribution 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 will 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. This course will explore these topics using foundational texts in biology, such as *The Origin of Species* and writings by the evolutionary biologist Stephen Jay Gould. It will feature guest lectures from curators from natural history museums across the country as well as offer students their own opportunity to go into the field to collect fossils here in Maryland.

Distribution Area: Natural Sciences, Social and Behavioral Sciences

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

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.

Distribution Area: Humanities, Social and Behavioral Sciences

**AS.001.182. FYS: Seeing Things. 3 Credits.**

This First-Year Seminar will explore diverse aspects of how we see and fail to see the world. We’ll discuss questions such as: What can we learn about vision from illusions and hallucinations? What explains why we sometimes miss things even though we’re looking right at them? Does what we believe and desire affect what we see? What happens to our visual experience when the brain is damaged, for example in conditions such as “blindsight,” “neglect” and “visual form agnosia”? And: Is there such a thing as subliminal or unconscious perception? Though primarily psychological, the course will draw on other disciplines, especially the philosophy of perception. We’ll also think about some of the ways visual artists and magicians exploit the workings of our visual systems to achieve their aims. This will likely involve at least one outing to a local art gallery to look for examples of what we’ve learned, an in-class screening, and hopefully a guest speaker or two.

Distribution Area: Social and Behavioral Sciences

**AS.001.200. FYS: Great Adaptations in the Animal Kingdom. 3 Credits.**

Animals have evolved a vast array of sensory systems that support a rich repertoire of natural behaviors. Some animals live in dark environments and use tactile, chemical, electrical and auditory sensors that allow them to operate in the absence of light. Other animals rely heavily on vision and take advantage of colors that humans cannot see. In this First-Year Seminar, we will explore extraordinary adaptations of sensory systems in animals that live on land and under water. Our focus will be on sensory systems that guide navigation and foraging behaviors in species as diverse as star-nosed moles, weakly electric fish, honeybees, and echolocating bats. As we delve into understanding the extraordinary sensory systems of selected species, we will also consider how these animals have inspired literary and visual artists. We aim to introduce students to a rich interdisciplinary experience that opens their eyes to new areas of inquiry as they take advantage of local resources, such as the National Aquarium, Baltimore Zoo, Wyman Park, Peabody School of Art, and Baltimore Museum of Art.

**AS.001.253. FYS: The Drama of Artificial Intelligence. 3 Credits.**

From the rise of machine consciousness to the ethics of automation, artificial intelligence has captured the human imagination. This First-Year Seminar explores how playwrights and theater artists engage with AI as a dramatic subject, a creative tool, and a lens for examining the human condition. Through an interdisciplinary approach, and co-taught by faculty in Psychological and Brain Sciences and Theatre, students will analyze and performances that grapple with the hopes and anxieties surrounding AI. Works such as Karel Capek’s *R.U.R.* (which introduced the word “robot”), Jordan Harrison’s *Marjorie Prime*, Jennifer Haley’s *The Nether*, and Nick Payne’s *Constellations* will serve as key texts alongside contemporary plays such as Julia Cho’s *The Language*, Rolin Jone’s *The Intelligent Design of Jenny Chow*, *The Effect* by Lucy Prebble, and *Photograph 51* by Anna Ziegler. We will also discuss experimental performances that integrate AI technologies.

## 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.

Distribution Area: Humanities, Social and Behavioral Sciences

AS Foundational Abilities: Citizens and Society (FA4), Ethics and Foundations (FA5)

EN Foundational Abilities: Engagement with Society (FA4)

## 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.080.306 OR (AS.020.312 AND AS.020.306) or instructor permission.

Distribution Area: Natural Sciences

AS Foundational Abilities: Science and Data (FA2)

### 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

Distribution Area: Natural Sciences

AS Foundational Abilities: Science and Data (FA2), Ethics and Foundations (FA5)

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