

# PSYCHOLOGY (PSYC)

## **PSYC 110a or b, Introduction to Psychology** Stephanie Lazzaro

A survey of major psychological approaches to the biological, cognitive, and social bases of behavior. SO

## **PSYC 116b / CGSC 216b / LING 116b, Cognitive Science of Language** Robert Frank

The study of language from the perspective of cognitive science. Exploration of mental structures that underlie the human ability to learn and process language, drawing on studies of normal and atypical language development and processing, brain imaging, neuropsychology, and computational modeling. Innate linguistic structure vs. determination by experience and culture; the relation between linguistic and nonlinguistic cognition in the domains of decision making, social cognition, and musical cognition; the degree to which language shapes perceptions of color, number, space, and gender. SO

## \* **PSYC 125a / CHLD 125a / EDST 125a, Child Development** Ann Close and Carla Horwitz

This course is **first in a sequence** including Theory and Practice of Early Childhood Education (CHLD127/PSYCH 127/EDST 127) and Language Literacy and Play (CHLD 128/PSYCH 128/EDST 128). This course provides students a theoretical base in child development and behavior and tools to sensitively and carefully observe infants and young children. The seminar will consider aspects of cognitive, social, and emotional development. An assumption of this course is that it is not possible to understand children – their behavior and development – without understanding their families and culture and the relationships between children and parents. The course will give an overview of the major theories in the field, focusing on the complex interaction between the developing self and the environment, exploring current research and theory as well as practice. Students will have the opportunity to see how programs for young children use psychodynamic and interactional theories to inform the development of their philosophy and curriculum. In the past students have done weekly in-person classroom observations at a Yale affiliated childcare program. If this is not possible, students will be expected to arrange on their own to do a weekly observation in-person or virtually of a child under the age of 6. For a portion of class meetings, the class will divide into small supervisory discussion groups. Priority given to juniors, seniors, Ed Study students. WR, SO

## **PSYC 130a / CGSC 110a, Introduction to Cognitive Science** Brian Scholl

An introduction to the interdisciplinary study of how the mind works. Discussion of tools, theories, and assumptions from psychology, computer science, neuroscience, linguistics, and philosophy. SO

## **PSYC 140a / EDST 140a, Developmental Psychology** Julia Leonard

An introduction to research and theory on the development of perception, action, emotion, personality, language, and cognition from a cognitive science perspective. Focus on birth to adolescence in humans and other species. Prerequisite: PSYC 110. SO

## **PSYC 141b / NSCI 141b, The Criminal Mind** Arielle Baskin-Sommers

Theoretical and empirical study of the development of criminal behavior, including constitutional, social, and neurobiological elements. Personality and psychopathological

factors associated with criminal behavior; theoretical and psychobiological explanations of crime; the biological/environment interaction; the impact of psychobiological models for policy and intervention. SO

**PSYC 150b / EDST 160b, Social Psychology** Jennifer Hirsch

Theories, methodology, and applications of social psychology. Core topics include the self, social cognition/social perception, attitudes and persuasion, group processes, conformity, human conflict and aggression, prejudice, prosocial behavior, and emotion. SO

**PSYC 160a / NSCI 160a, The Human Brain** Gregory McCarthy

Introduction to the neural bases of human psychological function, including social, cognitive, and affective processing. Preparation for more advanced courses in cognitive and social neuroscience. Topics include memory, reward processing, neuroeconomics, individual differences, emotion, social inferences, and clinical disorders. Neuroanatomy, neurophysiology, and neuropharmacology are also introduced. SC

**\* PSYC 230b / NSCI 240b, Research Methods in Human Neuroscience** Gregory McCarthy

Primary focus on structural, functional, and diffusion magnetic resonance imaging, with a secondary emphasis upon brain stimulation, electroencephalography, and evoked potentials. Students learn the fundamentals of each method and the experimental designs for which they are most applicable. Prerequisites: PSYC 160/NSCI 160 and a course in statistics, or permission of instructor. SC

**\* PSYC 235a or b, Research Methods, Writing Intensive** Staff

Introduction to general principles and strategies of psychological research. Topics include generating and testing hypotheses, laboratory and field experiments, scale construction, sampling, archival methods, case studies, ethics and politics of research, and Internet and cross-cultural methods. Hands-on research experience in laboratories. Prerequisite: PSYC 200 or S&DS 103. WR, SO

**\* PSYC 237b, Research Methods with Diverse Samples** Maria Gendron

Introduction to general principles and approaches to psychological research, with a focus on sampling diversity and cultural/cross-cultural research. Topics include generating and testing hypotheses, laboratory and field experiments, scale construction, sampling, archival methods, case studies, ethics, and politics of research. Hands-on research experience is part of the course. Prerequisites: PSYC 110 or Psychology AP equivalent, and Intro Statistics course (concurrent enrollment is acceptable with instructor permission). WR, SO

**PSYC 239b / CGSC 239b / LING 239b, Phonetics II: Speech Production and Perception** Jason Shaw

This course introduces theoretical tools for explaining physical aspects of speech, including speech articulation, acoustics, audition, and perception. Acoustic properties of speech sounds are derived from first principles, following acoustic theories of speech production. The course covers articulatory kinematics alongside contemporary theories of motor coordination and speech planning. Audition and speech perception are introduced in the context of signal processing and statistical tools for mapping the continuous phonetic signal to phonological representations. These topics are pursued in the context of speech examples from a wide range of natural languages, preparing

students to engage with primary literature in the field of phonetics. Prerequisites: LING 110, 116, 217, or 220. QR, SO

**\* PSYC 258b / NSCI 258b, Computational Methods in Human Neuroscience** Nick Turk-Browne

This course provides training on how to use computational science for the advanced analysis of brain imaging data, primarily from functional magnetic resonance imaging (fMRI). Topics include scientific programming, high-performance computing, machine learning, network/graph analysis, real-time neurofeedback, nonparametric statistics, and functional alignment. Prerequisites: CPSC 100, CPSC 112 or other course involving terminal commands and programming (Python preferred); course in statistics and/or data science; PSYC 160 or other human neuroscience course; or permission of instructor. QR, SC

**\* PSYC 260a / NSCI 260a, Research Methods in Psychopathology: Psychotic Disorders** Tyrone Cannon

Methods of research in psychopathology. Focus on longitudinal designs, high-risk sampling approaches, prediction of outcomes, and modeling change over time. Students design and perform analyses of clinical, cognitive, genetic, neuroimaging and other kinds of measures as predictors of psychosis and related outcomes, using existing datasets supplied by the instructor. SO

**\* PSYC 270a / NSCI 270a, Research Methods in Cognitive Neuroscience** Stephanie Lazzaro

This course introduces methods used by cognitive neuroscientists to discover the structural and functional features of the nervous system. A combination of lectures and hands-on lab activities help students understand the structure and function of the human brain. WR, SC

**\* PSYC 312a / ER&M 412a, Native American Mental Health** Mark Beitel and Christopher Cutter

Issues of health policy, research, and service delivery in Native American communities, with a focus on historical antecedents that shape health outcomes and social policy for indigenous communities. Urgent problems in health and wellness, with special attention to Native American mental health. The roles of the Indian Health Service, state and local agencies, and tribal health centers; comparison of Native American and European American conceptions of health and illness. SO

**\* PSYC 313b / CGSC 313b / PHIL 305b, Philosophy for Psychologists** Joshua Knobe  
Introduction to frameworks developed within philosophy that have applications in psychological research. Principal topics include the self, causation, free will, and morality. Recommended preparation: a course in philosophy or psychology. HU, SO

**PSYC 315a / CGSC 315a, The Modern Unconscious** Staff

The notion of the unconscious mind traced from the early 1800s through Freud to present-day cognitive science, with a focus on the past thirty years. The power and function of the unconscious as a pervasive part of normal everyday human functioning. Readings mainly from cognitive and social cognitive psychology but also philosophy of mind and evolutionary biology. SO

**PSYC 317a / EDST 237a / LING 217a, Language and Mind** Maria Pinango

The structure of linguistic knowledge and how it is used during communication. The principles that guide the acquisition of this system by children learning their

first language, by children learning language in unusual circumstances (heritage speakers, sign languages) and adults learning a second language, bilingual speakers. The processing of language in real-time. Psychological traits that impact language learning and language use. SO RP o Course cr

**PSYC 318a / LING 220a, Phonetics I** Jason Shaw

Each spoken language composes words using a relatively small number of speech sounds, a subset of the much larger set of possible human speech sounds. This course introduces tools to describe the complete set of speech sounds found in the world's spoken languages. It covers the articulatory organs involved in speech production and the acoustic structure of the resulting sounds. Students learn how to transcribe sounds using the International Phonetic Alphabet, including different varieties of English and languages around the world. The course also introduces sociophonetics, how variation in sound patterns can convey social meaning within a community, speech perception, and sound change. SO o Course cr

\* **PSYC 320a / ENGL 382a / FILM 280a, The Science and Culture of Memory** John Williams and Samuel McDougle

This is an FAS-sponsored cross-divisional course. This course offers a comparative and interdisciplinary approach to the science and culture of memory. We aim to bring traditional philosophies, narratives, and histories of memory into conversation with both long established and cutting-edge research findings on the neuroscience of memory. Questions explored in the course include: What is memory and how does it work? How has memory been conceptualized over time in both culture and science? What are the various media through which we process memories, including collective and individual forms? What can we learn from moments of mnemonic failure? What new technologies of memory are on the horizon? How is our vision of the future influenced by the content and processes of memory? In wrestling with these questions, we encounter a wide selection of narratives, art objects, films, and scientific data. Students also have an opportunity to explore their own experiences in learning and memory (including experiential assignments, e.g., asking them to memorize certain things and report on the experience, as well as opportunities to reflect on their experiences of and access to forms of collective, communal memory). HU, SO

**PSYC 327b / LING 227b, Language and Computation I** Robert Frank

Design and analysis of computational models of language. Topics include finite state tools, computational morphology and phonology, grammar and parsing, lexical semantics, and the use of linguistic models in applied problems. Prerequisite: prior programming experience or permission of instructor. QR, SO

**PSYC 331b / LING 231b, Neurolinguistics** Maria Pinango

The study of language as a cognitive neuroscience. The interaction between linguistic theory and neurological evidence from brain damage, degenerative diseases (e.g., Alzheimer's disease), mental illness (e.g., schizophrenia), neuroimaging, and neurophysiology. The connection of language as a neurocognitive system to other systems such as memory and music. At least one class that introduces students to linguistic theory and linguistic argumentation from at least one perspective, including any of the following: (1) LING 217 Language and Mind, (2) LING 110 Intro to linguistics, (3) LING 253 Syntax 1, (4) LING 112 Historical Linguistics, (5) LING 232 Phonology 1, (6) LING 220 General Phonetics, or (7) Instructor permission. SC, SO

**\* PSYC 334a / CHLD 334a, Developmental Psychopathology** Fred Volkmar, Eli Lebowitz, and Denis Sukhodolsky

Study of developmental psychopathology during childhood and adolescence, team taught by a child psychiatrist and three psychologists. Topics include: aspects of normal development, assessment methods, clinical disorders, treatment, and legal and social policy issues. Review of normative development, followed by discussion of theoretical approaches to understanding developmental aspects of common mental health conditions in childhood. Attention to treatment models as well as relevant issues of culture and ethnicity in the expression of psychopathology. Prerequisites: PSYC 130, 140, 180, or equivalent, or with permission of instructor.

**PSYC 342a / WGSS 315a, Psychology of Gender** Staff

Exploration of the relationship between gender and psychological processes at individual, interpersonal, institutional, and cross-cultural levels. SO

**\* PSYC 375b / CGSC 375b / LING 375b, Linguistic Meaning and Conceptual Structure**  
Staff

The meaning of a word or sentence is something in the human mind that has specific properties: it can be expressed (written/signed/spoken forms); it can be combined with other meanings; its expression is not language dependent; it connects with the world; it serves as a vehicle for inference; and it is hidden from awareness. The course explores these properties in some detail and, in the process, provides the students with technical vocabulary and analytical tools to further investigate them. The course is thus intended for those students interested in undertaking a research project on the structure of meaning, the nature of lexico-conceptual structure, that is, the structure of concepts which we refer to as “word meanings”, and how they may be combined through linguistic and non-linguistic means. Its ultimate objective is to bridge models of conceptual structure and models of linguistic semantic composition, identify their respective strengths and weaknesses and explore some of the fundamental questions that any theory of linguistic meaning composition must answer. Evidence discussed will emerge from naturalistic, introspectional, and experimental methodologies. Prerequisites: LING 110, CGSC 110, LING 217, or LING 263. SO

**\* PSYC 420a or b / CGSC 420a or b / NSCI 440a or b, Topics in Clinical Neuroscience**  
Avram Holmes

An overview and examination of the neuroscience of psychiatric illness. We focus on cutting-edge research in humans and animals aimed at understanding the biological mechanisms that underlie psychiatric illness. Although these questions date back to early philosophical texts, only recently have experimental psychologists and neuroscientists begun to explore this vast and exciting domain of study. We discuss the evolutionary and developmental origins of individual differences in human personality, measurement issues, fundamental dimensions of psychopathology, stability/plasticity, heritability, and implications therapeutic interventions as well as the associated broader implications for public policy. A major focus is on the neurobiology of fear and anxiety, including brain circuits, molecular genetic pathways, and epigenetics. A secondary focus is on differences in behavior and biology that confer risk for the development of depression and addiction, including the biological systems involved in hedonic pleasure, motivated goal pursuit, and the regulation of impulses in the face of everyday

temptation. Students should have some background in psychology; PSYC 110 and PSYC 160 preferred. SO

\* **PSYC 422a / CGSC 426a / EP&E 490a / PHIL 426a, The Cognitive Science of Morality** Joshua Knobe

Introduction to the emerging field of moral cognition. Focus on questions about the philosophical significance of psychological findings. Topics include the role of emotion in moral judgment; the significance of character traits in virtue ethics and personality psychology; the reliability of intuitions and the psychological processes that underlie them. HU

\* **PSYC 425b / CGSC 425b, Social Perception** Brian Scholl

Connections between visual perception, among the earliest and most basic of human cognitive processes, and social cognition, among the most advanced forms of higher-level cognition. The perception of animacy, agency, and goal-directedness; biological motion; face perception (including the perception of facial attractiveness); gaze processing and social attention; "thin-slicing" and "perceptual stereotypes"; and social and cultural influences on perception. SO

\* **PSYC 429b, Psychology of Prejudice, Stereotyping, and Discrimination** Jennifer Richeson

Examination of the social psychology of stereotyping, prejudice, and discrimination. Specifically, the processes of mind and brain that give rise to both positive and negative relations between members of different societal groups. PSYC 110, PSYC 200 (or equivalent), PSYC 235 (or equivalent), PSYC 150 (recommended)

\* **PSYC 430a, Topics in Cultural Psychology** Maria Gendron

Overview of theory and research in cultural psychology, including the role of culture in social, cognitive, and health domains. Principles of the acquisition, transmission, and evolution of culture. Specialized topics include culture in non-human animals, and the intersection between culture and globalization and technology. Prerequisite: PSYC 110. SO

\* **PSYC 435a / CGSC 435a, The Kinds We Keep: Sorting and Distorting Reality** Frank Keil

Sorting the world into kinds is crucial human cognition. It grounds concepts, the currency of thought. But this cognitive asset can corrode our humanity and become a curse if we fail to understand the attendant biases. We first consider some metaphysical assumptions about causal patterns in the world that sustain relatively stable kinds and how these provide grounds for building early categories. We then examine why humans, and most AI systems, must sort individuals into kinds to learn and think about the world. But while categorization greatly amplifies the power of thought, it also distorts what is sorted and how the resulting kinds are construed. We explore why learning is impossible without such distortions of and consider different sets of distortions and when they occur. We focus on thought about fundamental, or ontological kinds, many of which are first apprehended in infancy or early childhood. These include non-living natural kinds, goal-directed entities, thinking things, living things, and artifacts. We ask how human and artificial agents might take more care with the kinds they use. How can we embrace the kinds that inspire exploration and discovery without having our mis-construals turn them towards darker ends?

Prerequisites: PSYC 110 or CGSC 110 and two additional courses relevant to cognition.  
SO

\* **PSYC 437b / CGSC 437b, Minds, Brains, and Machines** Julian Jara-Ettinger  
Exploration of the implications that the brain is a kind of computer that gives rise to the mind. Readings combine classical and cutting-edge research in psychology, philosophy, and artificial intelligence. SO RP

\* **PSYC 438a / NSCI 441a, Computational Models of Human Behavior** Robb  
Rutledge

Why do we do the things we do? How do we adapt to changes in the environment? And how does our happiness depend on our choices and what happens to us? How can computational models help us to gain new insights into psychological processes? The goal of this course is to use computational models to understand human behavior and its relationship to our emotions. Data is collected in a variety of tasks including new experiments designed by students, and is analyzed using computational models. CPSC 112 or other course involving programming (e.g., C++, Java, Python, Matlab), or permission of instructor. SC

\* **PSYC 439a / CGSC 439a, The Psychology of Social Construction** Yarrow Dunham  
We live in a world replete with “forgeries that become genuine”: pieces of paper that become money, words that become promises, lines in the sand that become borders. Nearly every aspect of our lives is shaped and constrained by these kinds of socially constructed entities, things as real as mountains but far more mysterious. How do such entities come to be, and how do (and how should) we understand them? How are they made and how can they be contested when they go astray? Answering these questions requires ranging across diverse literatures beginning with psychology but including philosophy, anthropology, economics, and game theory. Prerequisite: PSYC 110 or CGSC 110. SO

\* **PSYC 449a / NSCI 449a, Neuroscience of Social Interaction** Steve Chang  
This seminar covers influential studies that inform how the brain enables complex social interactions from the perspectives of neural mechanisms. Students thoroughly read selected original research papers in the field of social neuroscience across several animal species and multiple modern neuroscience methodologies. In class, the instructor and students work together to discuss these studies in depth. Focused topics include neural mechanisms behind brain-to-brain coupling, empathy, prosocial decision-making, oxytocin effects, and social dysfunction. Prerequisite: PSYC 160 or permission from the instructor. SC

\* **PSYC 493a or b, Directed Research** Yarrow Dunham  
Empirical research projects or literature review. A student must be sponsored by a faculty member, who sets the requirements and supervises the student's progress. To register, the student must download a tutorial form from <http://psychology.yale.edu/undergraduate/undergraduate-major-forms>, complete it with the adviser, and submit it to the director of undergraduate studies by the deadline listed on the form. The normal minimum requirement is a written report of the completed research or literature review, but individual faculty members may set alternative equivalent requirements. May be elected for one or two terms. May not be used for the Psychology senior essay requirement.

**\* PSYC 495a or b, Research Topics** Yarrow Dunham

Empirical research project or literature review. A student must be sponsored by a faculty member, who sets the requirements and supervises the student's progress. To register, the student must download a tutorial form from <http://psychology.yale.edu/undergraduate/undergraduate-major-forms>, complete it with the adviser, and submit it to the director of undergraduate studies by the date indicated on the form. The normal minimum requirement is a written report of the completed research or literature review, but individual faculty members may set alternative equivalent requirements. May be elected for one or two terms. May not be used for the Psychology senior essay requirement. ½ Course cr

**\* PSYC 499a or b, Senior Essay** Yarrow Dunham

Independent senior research project (either empirical research or literature review), conducted under the guidance of a faculty adviser who sets the requirements and supervises the research. To register, the student must download a tutorial form from <http://psychology.yale.edu/undergraduate/undergraduate-major-forms>, complete it with the adviser, and submit it by the deadline indicated on the form. The normal minimum requirement is a written report of the completed research or literature review, but individual faculty members may set alternative equivalent requirements. A paper of 5,000 words or more meets the writing needed for the senior requirement. To be considered for Distinction in the Major, the paper should be submitted at least one week before the last day of classes and will be graded by the adviser and a second reader assigned by the DUS.