PSYCHOLOGY (PSYC)

**PSYC 110a or b, Introduction to Psychology**  Paul Bloom
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
The reading of selected material with supervised participant-observer experience in infant programs, a day-care and kindergarten center, or a family day-care program. Regularly scheduled seminar discussions emphasize both theory and practice. An assumption of the course is that it is not possible to understand children—their behavior and development—without understanding their parents and the relationship between child and parents. The focus is on infancy as well as early childhood. Enrollment limited to juniors and seniors.  **WR, SO**

**PSYC 126a, Attraction and Relationships**  Jennifer Hirsch
Theory and empirical research on the antecedents and consequences of attraction, and on intra- and interpersonal processes that either facilitate or interfere with the formation and maintenance of close relationships. Methodological bases for rigorous study of these topics.  **SO**

* PSYC 127b / CHLD 127b / EDST 127b, Theory and Practice of Early Childhood Education  Carla Horwitz
Development of curricula and responsive educational environments for young children—in light of current research and child development theory. The course focuses on critical analysis of programs for young children and the ways in which political context contributes to the practice of education. Regularly scheduled seminar discussions emphasize both theory and practice. Supervised participant-observer experience in an early childhood classroom. Components of the course include behavior and development, planning, assessment and standards, culture, teacher preparation, and working with families. Priority given to seniors, juniors and Ed Studies students.  **WR, SO RP**

* PSYC 128b / CHLD 128b / EDST 128b, Language, Literacy, and Play  Ann Close and Carla Horwitz
The complicated role of play in the development of language and literacy skills among preschool-aged children. Topics include social-emotional, cross-cultural, cognitive, and communicative aspects of play.  **WR, SO RP**

**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**  Frank Keil
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 141a / NSCI 141a, 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**  Maria Gendron
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 200b, Statistics**  Ilker Yildirim
Measures of central tendency, variability, association, and the application of probability concepts in determining the significance of research findings.  **QR**

* PSYC 235a or b, Research Methods, Writing Intensive  Jennifer Hirsch
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 237a, 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).  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 106, 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 270a / NSCI 270a, Research Methods in Cognitive Neuroscience
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 303b / NSCI 355b, Social Neuroscience  Molly Crockett
Exploration of the psychological and neural mechanisms that enable the formation, maintenance, and dissolution of social relationships. Topics include the neuroscience of how we form impressions and decide whether to instigate relationships with others; how we build relationships through trust, cooperation, attachment, conflict, and reconciliation; and group-level processes including intergroup bias, moral judgment, and decision making. Prerequisite: PSYC 110 or permission of instructor.  SC

PSYC 315a / CGSC 315a, The Modern Unconscious  John Bargh
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

PSYC 318b / LING 220b, General Phonetics
Investigation of possible ways to describe the speech sounds of human languages. Acoustics and physiology of speech; computer synthesis of speech; practical exercises in producing and transcribing sounds.  SO

PSYC 326a, Psychotherapy  Mary O'Brien
Psychotherapy is designed to introduce students to a broad range of evidence-based techniques for enhancing psychological functioning. We discuss theoretical and empirical readings, treatment manuals, videos of experts demonstrating therapeutic techniques, and relevant TED talks. Additionally, we engage in experiential learning and practice applying techniques in our daily lives. This course begins with a discussion of the importance of scientific evaluation of psychotherapy. Next, we explore multicultural competence in psychotherapy and consider ways to tailor each therapeutic approach to optimize the relevance and effectiveness for diverse populations. Techniques for establishing a therapeutic alliance are discussed and practiced, followed by exploration of therapeutic approaches from Cognitive Behavioral Therapy (CBT), Acceptance and Commitment Therapy (ACT), Self-Compassion and Growth Mindset research, Dialectical Behavior Therapy (DBT), Psycho-educational Family Therapy, and Couples and Group Therapy. Prerequisite: PSYC 180.  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 328b / EDST 328b, Learning in the School-Age Child: Core Mechanisms  Kristi Lockhart
This course focuses on empirically supported principles of learning that are used with K to 8th grade children (and also adolescents and adults) to enhance learning outcomes. We look at twenty-six (A to Z) core mechanisms used to promote learning. Each mechanism is explored from a theoretical, research-based, and practical perspective. Studies conducted in cognitive and perceptual psychology, social psychology, behavioral psychology as well as cultural psychology have contributed to the knowledge of these mechanisms. We discuss how the mechanisms work, what problems they overcome, and the positive (as well as negative) ways in which they can be implemented. Prerequisite: PSYC 110 or credit for AP Psychology.  SO

PSYC 330a, Psychology and the Law  Kristi Lockhart
Contributions of psychological theory and research to our understanding of the law and the criminal justice system. Topics include criminality, eyewitness testimony, lie detection, jury decision making, the death penalty, the insanity defense, civil commitment, prisons, repressed memories, children as witnesses and defendants, and the role of psychologists as expert witnesses and trial consultants.  SO
Natural sign languages like American Sign Language have all of the structure and complexity of spoken languages. They are learned and processed like spoken languages, and activate neural structures that maximally overlap with those activated by spoken languages. These findings have not only had important implications for the sociopolitical status of Deaf people, as a native, American minority community but also have caused linguists and neural scientists to re-evaluate their most fundamental theories of language representation and processing in the mind and brain. The course introduces you to the analysis of sign languages at different levels of linguistic structure and related aspects of cognition in the visual modality. The primary goal is to encourage you as linguists, psychologists, and cognitive scientists to consider how natural sign languages can and must inform your linguistic theories (linguistics), models of language and cognition (psychology), and technological applications of language processing (computer science/artificial intelligence). We also consider the ways in which signing communities/Deaf culture interact with the hearing world as marginalized minority groups and reflect upon access to language and information as a basic human right. Some background in linguistic structure, cognitive science, any signed language, or permission of the instructor is preferred.

* PSYC 332a / CGSC 300a / LING 300a / PSYC 309 / PSYC 632a, The Cognitive Science of Sign Languages  
Maria Pinango and Muye Zhang

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 350b / CHLD 350b / EDST 350b, Autism and Related Disorders  
Fred Volkmar and James McPartland
Weekly seminar focusing on autism and related disorders of socialization. A series of lectures on topics in etiology, diagnosis and assessment, treatment and advocacy, and disability science methods; topics cover infancy through adulthood. Supervised experience in the form of placement in a school, treatment center, or research setting for individuals with autism spectrum disorders. Details about admission to the course are explained at the first course meeting. Prerequisite: an introductory psychology course.

* PSYC 352a / CGSC 352a / NSCI 352a, Arrested or Adaptive Development of the Adolescent Brain  
BJ Casey
Study of empirical and theoretical accounts of adolescent-specific changes in the brain and in behavior that relate to the development of self control. Discussions will focus on adaptive and arrested adolescent brain development in the context of relevant legal, social, and health policy issues.

* PSYC 372a / LING 490a, Research Methods in Linguistics  
Raffaella Zanuttoni
Development of skills in linguistics research, writing, and presentation. Choosing a research area, identifying good research questions, developing hypotheses, and presenting ideas clearly and effectively, both orally and in writing; methodological issues; the balance between building on existing literature and making a novel contribution. Prepares for the writing of the senior essay.

* PSYC 405b, Social Emotions  
Margaret Clark
The nature and function of emotions in social context. How emotions such as happiness, sadness, fear, and anger shape how we relate to others; how the ways in which we relate to others shape our experience and expression of these emotions. The nature and functions of additional emotions that seem to arise only within the context of social relationships: feelings of hurt, guilt, gratitude, empathic joy, and empathic sadness.

* PSYC 408a, Topics in Thinking  
Woo-Kyoung Ahn
A survey of psychological studies on thinking and reasoning, with discussion of ways to improve thinking skills. Topics include judgments and decision making, counterfactual reasoning, causal learning, inductive inferences, analogical reasoning, problem solving, critical thinking, and creativity. Students who have taken PSYC 179 are not eligible to enroll in this course.

* PSYC 410b / PHIL 410b, The Self Over Time: Psychological and Philosophical Approaches  
Paul Bloom and Laurie Paul
What makes someone the same person over time? Philosophers and psychologists have long been fascinated by identity and the nature of the self. Philosophers ask: are there really such things as individuals who endure over time, from cradle to grave? Or is this an illusion—is a single life nothing but a string of related individuals? If so, is it rational to value who you are now over who you might become in the distant future? In any case, how can someone undergo profound change yet remain the same person? Psychologists explore beliefs and inclinations. What is our natural understanding of personal identity and the self, and how does this change through development? How does this understanding connect to how we think about moral responsibility, love, gratitude, and guilt? What can neuroscience and cognitive science tell us about the nature of a persisting self? In this course, we explore the nature of personal identity and see what happens when philosophy meets psychology. While the course begins with introductory material, we quickly get to contemporary debates of real interest.

Prerequisite: Some background in Psychology, Philosophy, or related disciplines. Permission of instructor is required.

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.

* PSYC 434a / CHLD 344a, 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.
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.

Research on children’s minds reveals early emerging abilities that help explain the developmental origins and early growth of wonder. We consider wonder as the joy of exploration and discovery. Preschoolers and even infants are driven to learn not just facts and statistics, but also underlying causal patterns that are at the heart of many sciences. They learn not just as individual but also as members of knowledge communities, and early on, they sense how to “harvest” knowledge from these communities. Yet, those joyous moments of discovery and exploration often fade as children grow older and cease to wonder. We explore how this decline occurs and its consequences. When people stop wondering, they fail to expand their grasps of the world and become ever more vulnerable to misunderstanding and manipulation by others. We examine possible ways to reverse the decline. Prerequisite: PSYC 110 or CGSC 110.

An overview and examination of the neuroscience of decision making. Interdisciplinary course highlighting research from cognitive neuroscience, psychology, behavioral economics, finance, marketing, computer science, and public health. Topics include utility and value, reinforcement learning, risky decision making, impulsivity and self control, social decision making, psychopathology, and commercial applications (e.g., neuromarketing and neurofinance). Permission of the instructor.

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)

Humans possess a remarkable ability to learn new skills, and retain memories for those skills throughout their life span (e.g., learning to ride a bicycle). The ease with which humans acquire and sharpen skills belies the complexity involved in selecting and executing the correct actions in a given situation. This course considers both foundational and contemporary psychology and neuroscience research regarding skill learning, with an emphasis on motor and reinforcement learning. The overall goal of the course is to gain an understanding of the different cognitive processes and algorithms that underlie skill acquisition. Prerequisite: PSYC 110. Recommended: PSYC 130, PSYC 160, PSYC 335, PSYC 376.

Stress is pervasive in everyday life. Why do humans experience stress, and what causes stress in today’s society? How does stress affect the ways we think, feel, and behave? Why are some people particularly susceptible to the effects of stress on mental and physical health? What factors can buffer against the consequences of stress, and how can we leverage stress management techniques to effectively cope with stress? This course draws from psychological, neurobiological, social, developmental, and clinical perspectives to address these questions. In addition to an in-depth study of theory, research, and intervention in the field of stress, this seminar is designed to translate scientific advances to help students learn how to more effectively manage stress in their own lives. Priority given to juniors and seniors. Prerequisites: There are no formal prerequisites for the course, but one of the following is strongly recommended: PSYC 110, PSYC 160, PSYC 230, PSYC 335, PSYC 352, or PSYC 376.

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.

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.

The influence of the family on development and maintenance of both normal and abnormal behavior. Special emphasis on the role of early childhood experiences. Psychological, biological, and sociocultural factors within the family that contribute to variations in behavior. Relations between family and disorders such as schizophrenia, depression, anorexia nervosa, and criminality. Family therapy approaches and techniques.

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 seventh calendar day from the beginning of the term. 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 requirement.

* **PSYC 495a or b, Research Topics**  Jutta Joormann
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 seventh calendar day from the beginning of the term. 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 be repeated for credit. May not be used for the Psychology senior requirement. ½ Course cr

* **PSYC 499a or b, Senior Essay**  Staff
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 to the director of undergraduate studies by the seventh calendar day from the beginning of the term. 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.