

PSYCHOLOGY

Directors of undergraduate studies: Yarrow Dunham (yarrow.dunham@yale.edu) [F]; Dylan (dylan.gee@yale.edu) Gee (dylan.gee@yale.edu) [Sp]; psychology.yale.edu

Psychology is the scientific study of the mind, the brain, and human behavior. The Psychology department offers coursework and research opportunities in the fields of clinical, cognitive, developmental, neuroscientific, and social psychology. By studying psychology, students better understand human behavior, including who we are, how we do the things we do, and how we enhance our lives and society. The Psychology major provides a foundation for careers in education and research; law; medicine and public health; politics and public policy; and in business fields such as marketing, finance, and management.

COURSE NUMBERING

Courses in the department are organized so that they are best taken in several parallel sequences. Courses numbered from 120–190 and ending in a zero are core survey courses that introduce students to major areas of psychology and provide additional background for more advanced courses. These courses represent major content areas of psychology; students should sample broadly from them before specializing. Courses numbered from 200–209 focus on statistics. Courses numbered from 210–299 teach general methodology or data collection in various areas of psychology. Courses numbered from 300–399 are more advanced courses in a particular specialization. Senior seminars, whose enrollment is limited to no more than twenty students, are numbered from 400–489. These seminars are best taken once a student has appropriate background. Courses numbered from 490–499 are special tutorial courses that require permission of the adviser and the director of undergraduate studies (DUS).

PREREQUISITE

PSYC 110, a general survey course, is prerequisite to several 100-level and all 200-level and above courses. This prerequisite may alternatively be satisfied by a score of 5 on the Psychology Advanced Placement test or a score of 7 on the IB Psychology exam.

REQUIREMENTS OF THE MAJOR

Standard major The standard major in Psychology for both the B.A. degree program and the B.S. degree program requires twelve credits beyond PSYC 110, including the senior requirement. The difference between the B.A. and the B.S. degree programs is the senior requirement (see below).

1. Because psychology is so diverse a subject, every student is required to take two courses from the social science point of view in psychology and two from the natural science point of view in psychology. Listed below are examples of courses that fulfill these requirements. A complete list of courses, updated each term, may be found on Yale Course Search (YCS) by searching "Any Course Information Attribute." At least one from each group must be a course designated as Core in the course listings and below. Students are expected to take their two core courses as early as possible in the major, normally within two terms after declaring their major.

Social science core (YC PSYC: Social Science Core): PSYC 140, 150, 180

Social science: Search YCS for courses with the YC PSYC: Social Science designation.

Natural science core (YC PSYC: Natural Science Core): PSYC 120, 130, 135, 160

Natural science: Search YCS for courses with the YC PSYC: Natural Science designation.

2. Because statistical techniques and the mode of reasoning they employ are fundamental in psychology, a course in statistics (PSYC 200) is required, preferably prior to the senior year. A student may substitute S&DS 103 for PSYC 200 or may substitute an examination arranged with the instructor of PSYC 200 for the course requirement. Students may take the examination only one time, and an additional course in psychology should be taken if the examination substitutes for PSYC 200. A student who has taken S&DS 103 may not take PSYC 200 for credit. If approved in advance by the DUS a second course in statistics that focuses on advanced statistical techniques relevant for research in psychology can be counted towards the major as a PSYC elective.
3. To assure some direct experience in collecting and analyzing data, students must elect at least one research methods course, preferably prior to the senior year, in which research is planned and carried out. For students pursuing the BS degree, this course **must** be taken prior to the senior year. Courses numbered between 210–299 fulfill this research methods requirement.
4. Students may, with permission of the DUS, count up to three term courses in other related departments toward the major. Appropriate courses are rare and only approved when the course has substantial empirical psychology content. Students should consult with the DUS in Psychology about selecting outside courses and should not assume that a course will count prior to that consultation. Getting this approval in advance is highly recommended.

Students interested in research are encouraged to take an independent study course (PSYC 493) as early as the sophomore year. Students may also take PSYC 495 for one-half course credit of independent research per term with prior permission of the faculty adviser and the DUS. To obtain permission, download the tutorial form from the department website, and submit it by the seventh calendar day before classes begin. These independent study courses are graded P/F. No more than a total of three credits from PSYC 490–499 combined may count toward the major.

Neuroscience track Students with a major interest in neuroscience may wish to elect the neuroscience track. Such students are considered Psychology majors for whom the requirements have been modified to accommodate their interests, and to reflect the multidisciplinary nature of modern neuroscience and psychology. Given the broad nature of the field of neuroscience, students may wish to concentrate their studies in one area of the field (e.g., behavioral, cellular and molecular, cognitive, affective, social, clinical, or developmental). Interested students are encouraged to meet with the track adviser, Steve Chang (steve.chang@yale.edu). Majors in the neuroscience track meet with the track adviser at the beginning of each term in their junior and senior years.

Requirements for the neuroscience track are the same as for the standard major, with the additional requirements listed below. A complete list of courses, updated each term,

may be found on Yale Course Search (YCS) by searching "Any Course Information Attribute."

1. Two terms of introductory biology are required for the major, BIOL 101-104. Students who have scored 5 on the Advanced Placement test in Biology or scored 7 on the IB Biology exam may place out of these courses.
2. Students must take PSYC 160 or 170 and a data-collection course (YCS attribute: YC PSYC: NSCI Track Rsrch Mthds) chosen from PSYC 230, 238, 250, 258 or 270. PSYC 229L, 260, or MCDB 320 may substitute for the PSYC 160 or 170 requirement, or MCDB 320 and 321L may substitute for PSYC 229L or 260, but not both. If MCDB 320 is substituted for a Psychology course, it cannot be counted as one of the two advanced science courses outside the department (see item 4 below).
3. As required for the standard major, students in the neuroscience track must take two social science courses, at least one of which must be designated as Core in the course listings. Students in the neuroscience track must also take a course from the natural science list in addition to the courses specified in item 2 above.
4. At least two advanced science courses (YCS attribute: YC PSYC: NSCI Track Adv Scie) must be chosen from Molecular, Cellular, and Developmental Biology and Ecology and Evolutionary Biology courses numbered 200 and above that deal with human and/or animal biology; recommended courses include MCDB 200, 202, 205, 210, 250, 300, 315, 320, E&EB 220, 225, and 240. Certain courses outside of these departments may also meet the advanced science requirement, including BENG 350, 421, CPSC 475, MB&B 300, 301, 420, 435, 443, 452, MATH 222, 225, 230, 231, and 241. Other courses may qualify for this requirement with permission of the neuroscience track adviser. Laboratory courses do not count toward the advanced science requirement. Students should note that many advanced science courses have prerequisites that must be taken first.

Credit/D/Fail No more than two term courses taken Credit/D/Fail may be applied toward the major; no 200-level course taken Credit/D/Fail may be applied toward the major.

SENIOR REQUIREMENT

Standard major Majors are required to earn two course credits from courses numbered PSYC 400–499. At least one of these courses (excluding PSYC 490–495, which can only be taken P/F) must be taken during the senior year, for which a student must write a substantial final paper (a minimum of 5,000 words) and receive a letter grade. The B.A. degree is typically awarded to students who conduct a nonempirical literature review during senior year. There are no restrictions in the research format for the B.A. The B.S. degree is awarded to students who conduct empirical research through PSYC 499 during senior year. An empirical research project normally includes designing an experiment and collecting and analyzing the data. Students pursuing the B.S. degree will want to identify a faculty advisor well in advance of the semester in which they intend to complete their senior essay.

Neuroscience track The senior requirement for the neuroscience track is the same as for the standard major, except that the two required course credits from PSYC 400–499 must have neuroscience content (Consult YCS for courses with the YC PSYC: NSCI

Track Senior Sem designation). Students pursuing the B.S. degree in the track must carry out a neuroscientific empirical project in PSYC 499 and must be supervised by a faculty member within the neuroscience area of the Psychology department. Students who wish to work with an affiliated faculty member studying neuroscience outside the department must obtain permission from the neuroscience track adviser. Students pursuing the B.S. degree will want to identify a faculty advisor well in advance of the semester in which they intend to complete their senior essay.

Distinction in the Major To be considered for Distinction in the Major, students must submit a senior essay to the Psychology department at least one week before the last day of classes in the term when the course used for the senior essay is taken. Senior essays that are submitted after the deadline will be subject to grade penalties. Senior essays considered for Distinction in the Major are graded by a second reader and the essay adviser.

ADVISING

Schedules for all majors must be discussed with, and approved by, the DUS or the adviser for the neuroscience track in Psychology. For questions concerning credits for courses taken at other institutions or at Yale but outside the Department of Psychology, students should consult with the DUS. For questions concerning the neuroscience track, students should consult with the adviser for the neuroscience track in Psychology.

Computer Science and Psychology major The interdepartmental major in Computer Science and Psychology may be considered by students with interests lying squarely between the two disciplines. See Computer Science and Psychology for more information.

SUMMARY OF MAJOR REQUIREMENTS

STANDARD MAJOR

Prerequisite PSYC 110

Number of courses 12 courses beyond prereq (incl senior req)

Specific course required PSYC 200 or S&DS 103

Distribution of courses *B.A.* or *B.S.* – 2 social science courses and 2 natural science courses, as specified; 1 course numbered PSYC 210–299

Substitution permitted For PSYC 200, S&DS 103 or exam arranged with instructor; up to 3 relevant courses in other depts, with DUS permission

Senior requirement *B.A.* – 1 course credit from PSYC 400–489 or 499 taken during senior year; 1 additional course credit from PSYC 400–499; *B.S.* – PSYC 499 taken during senior year; 1 additional course credit from PSYC 400–499

NEUROSCIENCE TRACK

Prerequisite PSYC 110

Number of courses 12 courses beyond prereq (incl senior req); same as for the standard major with the additional requirements listed below

Specific courses required BIOL 101–104 unless students place out; PSYC 160 or 170; PSYC 200; PSYC 230, 238, 250, 258 or 270.

Distribution of courses *B.A.* or *B.S.* – 2 social science courses and 1 natural science course, as specified; at least 2 advanced science courses, as specified

Substitution permitted MCDB 320 or PSYC 229L or 260 may substitute for PSYC 160 or 170; or MCDB 320 and 321L may substitute for PSYC 229L or 260; S&DS 103 or exam arranged with instructor for PSYC 200

Senior requirement *B.A.* – 1 course credit from PSYC 400–489 or 499 with neuroscience content taken during senior year; 1 additional course credit from PSYC 400–499 with neuroscience content; *B.S.* – PSYC 499 taken during senior year, with neuroscience content in a research project; 1 additional course credit from PSYC 400–499 with neuroscience content

The field of psychology scientifically studies the mind and behavior. Psychologists study a number of specific topics including perception, cognition, emotion, motivation, personality, development, mental health, social processes, and organizational behavior. Understanding these topics requires multiple perspectives, and the field uses a number of different levels of analysis. Psychologists investigate mental processing from the level of the neurons and brain function up to the level of how behavior is shaped by complex social processes. Because of this interdisciplinary breadth, psychology is by nature a diverse discipline that spans the natural and social sciences.

The Psychology major aims to provide students with a strong academic foundation in the science of psychology. Students who major in Psychology often differ widely in their reasons for choosing the major and in their post-graduation plans. Some students go on to graduate training in Psychology, while others enter professional schools (e.g., medicine and law) or choose from a variety of professions such as education or business and finance. The specific requirements of the major ensure that students with a variety of goals can achieve the necessary background in psychology within the context of a general liberal arts education.

The prerequisite to many courses in the major is PSYC 110. Students interested in the major are encouraged to take PSYC 110 during the first year. This prerequisite may be waived for students who present a score of 5 on the AP test in Psychology or a score of 7 on the IB Psychology exam.

The following introductory courses also have no prerequisites and are open to first-year students:

PSYC 126, Attraction and Relationships

PSYC 130, Introduction to Cognitive Science

PSYC 140, Developmental Psychology

PSYC 141, The Criminal Mind

PSYC 150, Social Psychology

PSYC 160, The Human Brain

PSYC 165, Personality Psychology

PSYC 170, Fundamentals of Neuroscience

PSYC 180, Clinical Psychology

FACULTY OF THE DEPARTMENT OF PSYCHOLOGY

Professors Woo-kyoung Ahn, John Bargh, Tyrone Cannon, B. J. Casey, Marvin Chun, Margaret Clark, Melissa Ferguson, Jutta Joormann, Frank Keil, Joshua Knobe, Gregory McCarthy, Jennifer Richeson, Peter Salovey, Laurie Santos, Brian Scholl, Nick Turk-Browne

Associate Professors Arielle Baskin-Sommers, Steve Wohn Chang, Molly Crockett, Yarrow Dunham, Avram Holmes

Assistant Professors Dylan Gee, Maria Gendron, Julian Jara-Ettinger, Julia Leonard, Sam McDougle, Robb Rutledge, Ilker Yildirim

Lecturers Jennifer Hirsch, Stephanie Lazzaro, Kristi Lockhart, Mary O'Brien, Matthias Siemer

See visual roadmap of the requirements.

View Courses

Courses

PSYC 110a or b, Introduction to Psychology Staff

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

PSYC 115b, History of Psychology: Racism and Colonial Power Tariq Khan

This course introduces students to the history of psychology with a focus on racism and colonial power embedded in the "mind sciences." Students grapple with primary and secondary sources which prompt them to think critically about the past and present of psychology and the ways in which systems of race, gender, and class inequality interact with major institutions, systems, and research practices. Students study the historical relationship between the "mind sciences" and the intertwined systems/institutions of white supremacy/racial hierarchy, cisheteropatriarchy, capitalism, empire, and colonialism from the 17th century to the present. Students also examine the role some psychologists and related scientists and scholars have played in challenging and resisting those same intertwined systems and institutions. This course is interdisciplinary in that, in addition to studying works by psychologists, students study, analyze, and critique works in other fields—such as history, anthropology, ethnic studies, and postcolonial studies—which are relevant to understanding the historical development of the psychological sciences. SO o Course cr

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. Weekly Observations:-Total Time Commitment 3 hours per week. Students will do two separate weekly observations over the course of the semester. They will observe in a group setting for 2 hours each each week at a Yale affiliated child care center. Students will also arrange to do a weekly 1 hour observation (either in person or virtually) of a child under the age of 6. Students must make their own arrangements for these individual observations. If it is not possible to arrange a child to observe, please do not apply to take this course. 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 David Kinney

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 150a / EDST 160a, 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 157, Psychology and the Good Life**]

PSYC 160a / NSCI 160a, The Human Brain Robb Rutledge

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 179a, 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, causal learning, logical reasoning, problem solving, creativity, intelligence, moral reasoning, and language and thought. SO

PSYC 180a / EDST 180a, Clinical Psychology Jutta Joermann

The major forms of psychopathology that appear in childhood and adult life. Topics include the symptomatology of mental disorders; their etiology from psychological, biological, and sociocultural perspectives; and issues pertaining to diagnosis and treatment. SO

PSYC 182a / CGSC 282a / PHIL 182a, Perspectives on Human Nature Staff

Comparison of philosophical and psychological perspectives on human nature. Nietzsche on morality, paired with contemporary work on the psychology of moral judgment; Marx on religion, paired with systematic research on the science of religious belief; Schopenhauer paired with social psychology on happiness. HU o Course cr

PSYC 200a, Statistics Staff

Measures of central tendency, variability, association, and the application of probability concepts in determining the significance of research findings. QR o Course cr

* **PSYC 230a / NSCI 240a, 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 258, Computational Methods in Human Neuroscience]* **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 261a / CGSC 274a / NSCI 361a, Algorithms of the Mind Ilker Yildirim

This course introduces computational theories of psychological processes, with a pedagogical focus on perception and high-level cognition. Each week students learn about new computational methods grounded in neurocognitive phenomena. Lectures introduce these topics conceptually; lab sections provide hands-on instruction with programming assignments and review of mathematical concepts. Lectures cover a

range of computational methods sampling across the fields of computational statistics, artificial intelligence and machine learning, including probabilistic programming, neural networks, and differentiable programming. Students must have a programming background, ideally in a high-level programming language such as Python, Julia or Matlab. Students must also have college-level calculus. The course will substantially use Julia and Python. QR, SC, SO o Course cr

PSYC 303a / NSCI 355a, Social Neuroscience Stephanie Lazzaro

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 305a / CHLD 228a / EDST 228a, Contemporary Topics in Social and Emotional Learning** Christina Cipriano

While our nation's youth are increasingly more anxious and disconnected than ever before, social and emotional learning, or SEL, is being politicized by arguments without empirical evidence. The reality is that due in part to its interdisciplinary origins, and in part to its quick uptake, what SEL is, why it matters, and who it benefits, has garnered significant attention since its inception. Key questions and discourse over the past three decades include if SEL skills are: another name for personality, soft skills, 21st century skills, or emotional intelligence, are SEL skills stand-alone or do they need to be taught together and in sequence, for how long does the intervention need to last to be effective, how do you assess SEL, are SEL skills culturally responsive and universally applicable, and can SEL promote the conditions for education equity? In this seminar, students unpack these key questions and challenge and evolve the current discourse through seminal and contemporary readings, writing, and artifact analyses. Students are provided with the opportunity to engage critically with the largest data set amassed to date of the contemporary evidence for SEL. Prerequisite: CHLD 125, or PSYC 125, or EDST 125.

[PSYC 308, Intergroup Relations: The Psychology of Social Inequality]

PSYC 310b, Psychology and Global Capitalism Tariq Khan

This course examines the historical relationship between the development of the psychological sciences and the development of global capitalism. Students grapple with primary and secondary sources which prompt them to think critically about the past and present of psychology and the ways in which the psychological sciences served the interests of, shaped, and were shaped by dominant economic and political systems. Students study the historical relationship between the "mind sciences" and the intertwined systems of capitalism, imperialism, and white supremacy from the 17th century to the present. Students also examine the role some psychologists and related scientists and scholars have played in challenging and resisting those same intertwined systems and institutions. This course is interdisciplinary in that, in addition to studying works by psychologists, students will study, analyze, and critique works in other fields—such as history, anthropology, ethnic studies, and postcolonial studies—which are relevant to understanding the historical development of global capitalism and the psychological sciences. SO

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

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 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 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 327b / LING 227b, Language and Computation I Tom McCoy

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

PSYC 329b / LING 146b / WGSS 145b, Language and Gender Natalie Weber

An introduction to linguistics through the lens of gender. Topics include: gender as constructed through language; language variation as conditioned by gender and sexuality within and between languages across the world; real and perceived differences between male and female speech; language and (non)binarity; gender and noun class systems in language; pronouns and identity; role of language in encoding, reflecting, or reinforcing social attitudes and behavior. SO

PSYC 335b / NSCI 340b, Cognitive Neuroscience Steve Chang

This course covers how cognition is made by the brain. Students learn brain mechanisms underlying human cognition, including making decisions, paying attention, regulating emotion, remembering events, as well as understanding others. The course discusses both established and newly emerging findings based on several landmark experiments in both humans and animals. During this process, students are also introduced to cutting-edge techniques in cognitive neuroscience for studying human cognition. Prerequisite: PSYC 160 or specific chapter readings from the instructor. SC

PSYC 342a / WGSS 315a, Psychology of Gender Tariq Khan

This course explores the historical relationship between the "mind sciences" and dominant gender notions, ideologies, and norms. Students will critically examine the historical role that psychology and related fields have played in reinforcing and perpetuating things such as gender hierarchy, the gender binary, and the cis-hetero-patriarchal nuclear family unit, among other things. Students will be introduced to works that illuminate the larger underlying social, political, and economic systems, institutions, and historical processes that are co-constitutive with these gender hierarchies, ideologies, and norms, with an emphasis on the role of psychology and related fields. Students will also learn about psychologists and related scientists and scholars whose work has challenged those systems and institutions toward a more emancipatory vision for the role of psychology in society, and how their work has shaped the field. None SO

[PSYC 355, Clinical Psychology in the Community]

[PSYC 405, Social Emotions]

[PSYC 411, Systems Neuroscience]

* **PSYC 422b / CGSC 426b / EP&E 490b / PHIL 426b, 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 425, Social Perception]

* **PSYC 426a, Foundations of Logical Thought in Cognitive Development** Nicolò Cesana-Arlotti

This is a seminar surveying the cognitive, developmental, and evolutionary origins of our capacities to use logical representations and deductive inferences to learn, form predictions, and make decisions. The seminar explores the growing field of research that investigates the foundations of logical thought in language acquisition, in preverbal infants' cognition, and in the mind of our close and distant relatives in the animal world. There are no formal prerequisites for this course, but this course is designed for advanced students who have already completed introductory psychology coursework (PSYC 110, Introduction to Psychology) SO

*** PSYC 427b / CGSC 427b, The Rise and Fall of Wonder: When Early Passions for Exploration and Discovery Decay with Age** Frank Keil

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. SO

[PSYC 428, Neuroscience of Decision-Making]

PSYC 429a, 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 430b, 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 432b / NSCI 455b, Under Pressure: The Psychology of Stress** Dylan Gee

While stress serves an adaptive function that is critical for survival, chronic or extreme stress can have a negative impact on mental and physical health. Understanding the broad range of factors that can exacerbate or reduce stress, how we respond to stress, and the ways that experiences and effects of stress can differ across people and across stages of development can provide foundational insights for dealing with stress in our lives. This seminar integrates psychological, neurobiological, social, developmental, and clinical perspectives on stress. In addition to developing a foundation in the theoretical and empirical literature on stress, students will have the opportunity to engage in experiential learning related to coping skills drawn from evidence-based interventions in psychology. Priority given to 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. SO

*** PSYC 436a / EDST 436a, Translating Developmental Science into Educational Practice** Julia Leonard

Recent insights from developmental psychology and neuroscience on synaptic plasticity, critical periods, metacognition, and enriched environments are ripe for application to improve children's lives. Yet sometimes the translation of research into practice is a bridge too far. In this course, we discuss cutting-edge research in

developmental cognitive and neural sciences and examine how these findings can inform policy and educational practice. so

[**PSYC 437, Minds, Brains, and Machines**]

* **PSYC 443b / NSCI 443b, Topics in the Neuroscience of Memory** Stephanie Lazzaro
A seminar style overview and examination of the neuroscience of memory. In this seminar, we discuss some significant historical findings in the study of memory, as well as focus on more recent, current research. How memory works and how memories can be altered and improved are discussed. Topics may include sleep and memory consolidation, re-consolidation, false memories, superior autobiographical memory, as well as the effects of rewards, novelty, exercise, and social cues on various types of memory. Goals for this course include acquiring an in-depth and integrative understanding of the current research and directions surrounding the neuroscience of memory, and thinking critically about the methodology and evidence in the research papers that are read and discussed. We discuss strengths and limitations of the research and theories, as well as real-world applications. Prerequisites: PSYC 110, PSYC 160, or PSYC 130

* **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 457a, Communicating Psychological Science** Laurie Santos
Examination of best practices in the communication of psychology. The course explores strategies for communicating psychological findings to varying audiences (e.g., policy makers, popular media) and in varying formats (op-eds, long-form articles, podcasts, short videos) with the goal of gaining the skill and confidence necessary to give psychological science its broadest possible reach. Students choose specific psychological topics based to cover in their communication projects and explore current challenges within psychology communication (e.g., the ethics of psychology communication, exploring the issue of replication in the field of psychological science). Readings include examples of different forms of psychology communication along with the published empirical papers associated with those readings. Seminar discussions include a workshop component where students provide feedback on other students' creative writing/communication projects. Graded assignments include both group-based creative projects (short videos and podcast clips) and individual written work, including weekly directed writing exercises. Prerequisites: PSYC 110, PSYC 200 (or equivalent), and at least two other upper-level courses in PSYC. so

* **PSYC 479b / NSCI 479b, Computational Basis of Seeing and Thinking** Ilker Yildirim

The goal of this seminar is to discuss the computational basis of seeing and thinking in the mind and brain. We are especially concerned with this question of how perception gets us to cognition: How is it that perception transforms raw, unprocessed,

unorganized, incoming sensory signals arising from our physical environments – for example, the light that bounces off surfaces and arrives at your retina, raw audio waves hitting your ears, or the vibro-tactile sensations you feel at your fingertips when you touch a surface – into things like objects and people, into things that we can think about? We somewhat prioritize the field of scene perception, where many fundamental questions about the nature of seeing and aspects of cognition arise prominently, and much of those questions remain open to this date. We draw upon readings and classroom discussions to find out where the literature stands, including behavioral, neural, and computational studies, all in the context of searching for a mechanistic, functional account of how the brain produces percepts and thoughts about objects, scenes, and people. so

*** 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.