

# PSYCHOLOGY

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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 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 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 the 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 a 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 130, 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 psychology course 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 ensure some direct experience in collecting and analyzing data, students must elect at least one research methods course, preferably before 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 (this course is often taken twice in sequence). To obtain permission, follow the instructions on the department website to fill out the enrollment survey and then add the class normally, being sure to request instructor permission. This process must be completed at least one week before the end of the add/drop period for a given semester. 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 concentration** Students with a major interest in neuroscience may wish to elect the neuroscience concentration. 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 contact the concentration adviser, Steve Chang ([steve.chang@yale.edu](mailto:steve.chang@yale.edu)). Majors in

the neuroscience concentration must check in with the concentration adviser at the beginning of each term in their junior and senior years.

Requirements for the neuroscience concentration 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 and a data-collection course (YC PSYC: NSCI Track RsrchMthds) chosen from PSYC 230, 238, 250, 258 or 270. PSYC 229L, 260, or MCDB 320 may substitute for the PSYC 160 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 concentration must take two social science courses, at least one of which must be designated as Core in the course listings. Students in the neuroscience concentration 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 (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 concentration 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, or course taken to satisfy a 200-level requirement (e.g. S&DS 103), can be taken Credit/D/Fail and then applied toward the major.

**Searchable attributes** YC PSYC: Social Science Core, YC PSYC Social Science, YC PSYC: Natural Science Core, YC PSYC: Natural Science, YC PSYC: NSCI Track RsrchMthds, YC PSYC: NSCI Track Adv Scie, YC PSYC: NSCI Track Senior Sem

## 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, and they may want to seek research experiences with that faculty member prior to the senior year.

**Neuroscience concentration** The senior requirement for the neuroscience concentration is the same as for the standard major, except that the two required course credits from PSYC 400–499 must have neuroscience content (YC PSYC: NSCI Track Senior Sem designation). Students pursuing the B.S. degree in the concentration 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 concentration 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, and they may want to seek research experiences with that faculty member before the senior year.

**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 concentration 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 concentration, students should consult with the adviser for the neuroscience concentration 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 CONCENTRATION

**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, 200, 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 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

## Courses

**PSYC 110a, Introduction to Psychology** Samuel McDougle

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** Staff

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 118a, Disney: A Case Study in Applied Psychology** Katherine Battle

Disney wields enormous influence on our society. Its domination of social media, film, theme parks, and online merchandising allows Disney to shape entire generations. This course uses a theoretical and empirical framework of psychology to examine how Disney exerts its influence and what impact that influence has on behavior, self-perception, and mental health. We incorporate theories and practices from a wide range of branches of psychology including social, clinical, industrial/organization, neuropsychology, developmental, environmental, and media psychology as a

foundation for the seminar. The course interweaves related multidisciplinary readings and insights from perspectives including (but not limited to) women's, gender, and sexuality studies; race and ethnicity; film and media; visual arts; music; environmental studies; food/health; philosophy/morality; global affairs; and economics. The course begins with an overview of how Disney uses psychology to influence behavior in its theme parks, online marketing, and workplace and will culminate in a critical examination of representation in Disney films/media and the psychological literature on how that representation impacts self-perception and mental health. Students have ample opportunity to focus on specific areas of interest in weekly responses and longer writing assignments. Prior coursework in psychology is not necessary, nor is it assumed. Prior coursework in psychology is not necessary, nor is it assumed. 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 127b / CHLD 127b / EDST 127b, Theory and Practice of Early Childhood Education** Carla Horwitz

The course deals with development and delivery of curricula for young children ages 3-6 and the current context of educational reform and debate. Goals are to deepen insights through critical analysis of educational programs for young children in light of current research and developmental theory and to understand how political context contributes to the practice of education. Regularly scheduled seminar discussions and workshops that engage students with learning materials emphasize the ongoing dynamic process of developing emergent curriculum and focus on methods of creating a responsive, inclusive environment; planning and assessment; appreciating cultural and linguistic diversity; teachers' roles; anti-bias education; working with families; conceptualizing the professional challenges of collaborating on a teaching team within the organization of the school; standards and accountability and the role of policy

and advocacy in educational change. The course will use newspaper and magazine articles and other recent media as primary sources in addition to current research and other texts. Students must arrange to do a weekly one-hour observation (in-person or virtually) of a child under age 6 and an additional 2 hour in-person classroom observation at Calvin Hill Day Care Center. Total observation time commitment is 3 hours per week. CHLD 125 is recommended. Permission of instructor is required. Priority given to juniors, seniors, and Ed Study students. WR, SO RP

**\* PSYC 128b / CHLD 128b / EDST 128b, Language, Literacy, and Play** Ann Close and Carla Horwitz

The focus of this course will be to demonstrate the complicated role that play has in the development of language and literacy skills. A major part of each topic presentation will be a discussion of the role that play has in the curriculum in enhancing these developmental areas. There is a widespread consensus that play is an essential component of a developmentally appropriate early childhood curriculum. Research indicates that play enhances a child's creativity, intellectual development and social emotional development. Because learning to play, learning language and learning literacy skills are all part of the process of thinking and communication, **the course will provide a view which attempts to demonstrate the integration of language, literacy and play in an early childhood education curriculum.** Theoretical aspects of each of these developmental areas will be examined first, and it will be that theoretical understanding which will be the basis upon which ideas about curriculum will be explored, experienced and discussed. Students must arrange to do a weekly one-hour observation (in-person or virtually) of a child under age 6 and an additional 2 hour in-person classroom observation at Calvin Hill Day Care Center. Total observation time commitment is 3 hours per week. Permission of instructor. Enrollment priority will be given to juniors, seniors, and education study scholars. 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** 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 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 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** 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 200a, Statistics** Staff

Measures of central tendency, variability, association, and the application of probability concepts in determining the significance of research findings. This course may not be taken after S&DS 100. QR o Course cr

**\* PSYC 235a, Research Methods, Writing Intensive** Yarrow Dunham

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 303, Social Neuroscience ]****[ PSYC 308, Intergroup Relations: The Psychology of Social Inequality ]****\* PSYC 314a / CGSC 314a, Performance Psychology and Neuroscience** Marvin Chun

Human cognitive and motor performance fluctuates over time and varies across situations. What explains peak performance and how can it be sustained? The variation can be explained by neural mechanisms of attention and executive control; psychological factors like emotion, stress, mindset, and positive thinking; and physiological factors such as sleep and exercise, which affect the brain and mind. 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** Natalie Weber

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 327a / LING 227a, Language and Computation I** Tom McCoy

This course introduces the design and analysis of computational models of language. There are many properties of language that make it challenging to handle computationally: First, language is ambiguous - a given word or sentence can have many possible meanings. Second, our linguistic experience is sparse - many aspects of language (e.g., certain sentence structures) occur very rarely, posing a challenge for computational systems that learn from data. Third, language has an enormous amount of hidden structure - words and other linguistic units can have complex relationships with each other that are not apparent on the surface. In this course, we explore the computational approaches that can overcome these challenges. Topics include finite state tools, neural networks, Bayesian approaches, 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  
o Course cr

**\* PSYC 350b / CHLD 350b / EDST 350b, Autism and Related Disorders** Mariana Torres-Viso, Kelly Powell, 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 social neuroscience methods; topics cover infancy through adulthood. Supervised experience in the form of placement in a school, residence, or treatment 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. SO

**[ PSYC 355, Clinical Psychology in the Community ]****\* PSYC 375a / CGSC 375a / LING 375a, Linguistic Meaning and Conceptual Structure** Maria Pinango

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 405, Social Emotions** ]

\* **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. SO

[ **PSYC 411, Systems Neuroscience** ]

[ **PSYC 425, Social Perception** ]

[ **PSYC 428, Neuroscience of Decision-Making** ]

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

\* **PSYC 440a, The Psychology of Attraction and Close Relationships** Margaret Clark

This course is an advanced seminar covering psychological research on interpersonal attraction and intra- and interpersonal psychological processes that lead to thriving (or stumbling) in close relationships such as friendships, romantic relationships, and family relationships. It covers research on what attracts people to one another, relationship initiation, commitment, and the maintenance and deterioration of relationships. It is neither a self-help nor clinical course but, rather, a social psychological course focusing on processes that influence most people's relationships which also includes some work on individual differences in the functioning of close relationships. This course has no set prerequisites. One research methods course in psychology and at least one lecture course covering aspects of social psychology (e.g. introductory psychology, social psychology) are suggested. It is most appropriate for junior and senior psychology majors and for social psychology or clinical psychology graduate students interested in relational processes. SO

\* **PSYC 442a / NSCI 444a, Topics in Clinical Neuroscience** Tyrone Cannon

This course is an advanced seminar examining the biological bases of psychopathology. We cover research, theory, and controversies regarding the roles of genetics, neurotransmitter systems, brain development and function, and other biological influences in the major classes of mental disorders, including anxiety disorders, depression, schizophrenia, bipolar disorder, obsessive compulsive disorder, substance use disorders, eating disorders, and autism. Prominent theories emanating from cognitive, behavioral, and interpersonal approaches to psychopathology are examined in the context of multilevel models of behavior, and the interplay of biological and psychological factors are a central theme throughout. Prerequisite: PSYC 160 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 453a, The Science of the Human Mind: Pioneers between the Objective and Subjective** Kia Nobre

The human mind, with its subjective nature, is the most mysterious and elusive of all substances in the known universe. It took intrepid thinkers and ingenious scientists to forge the objective empirical study of mental functions. Today human experimental psychology, cognitive science, and neuroscience are thriving. How far have we come from the pioneering days and are we headed in a good direction? This seminar course will offer the advanced and scholarly minded student the opportunity to take a deep dive into the fundamental breakthroughs that opened the experimental study of the human mind and that continue to push the boundaries between the objective and subjective in new directions. PSYC 101 PSYC 130 - Introduction to Cognitive Science or PSYC 160 - The Human Brain PSYC 335 - Cognitive Neuroscience (is strongly advised but not strictly required) SO

**\* PSYC 493a, 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, 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, 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.