PSYCHOLOGY

**Director of undergraduate studies:** Jutta Joormann (jutta.joormann@yale.edu), 205 K, 432-0699; psychology.yale.edu

Psychology is the scientific study of the mind, the brain, and human behavior. The Psychology department offers course work 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 twenty students, are numbered from 400–489. These seminars are best taken once a student has appropriate background. Courses numbered from 490 to 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**

The standard major in Psychology for both the B.A. degree program and the B.S. degree program requires twelve term courses beyond PSYC 110, including the senior requirement.

1. Because psychology is so diverse a subject, every student is required to take four courses from the list below. Two of these courses must be from the social science point of view in psychology and two must be from the natural science point of view. At least one from each group must be a course designated as "Core" in the course listings. 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:** PSYC 125, 126, 127, 128, 131, 136, 139, 140, 141, 150, 151, 157, 165, 180, 181, 182, 232L, 250, 280L, 308, 313, 315, 330, 332, 334, 342, 355


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&D 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 once, and an additional course in psychology should be taken if the examination substitutes for PSYC 200. A student who has taken S&D 103 may not take PSYC 200 for credit.

3. To assure some direct experience in collecting and analyzing data, students must elect at least one course, preferably prior to the senior year, in which research is planned and carried out. 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 students should consult with the DUS in Psychology about selecting outside courses.

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 after 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, B. J. Casey (bj.casey@yale.edu), 414D SSS, 432-7790. 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 following additional requirements:

1. Two terms of introductory biology are required for the major, either MCDB 120 or BIOL 101 and 102, and either E&EB 122 or BIOL 103 and 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 chosen from PSYC 230L, 260, or 270. MCDB 320 may substitute for the PSYC 160 or 170 requirement, or MCDB 320 and 321L may substitute for the PSYC 230L, 260, or 270 requirement, 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 courses from the social science list above, 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 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 BENF 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.

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. 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.

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. Only then may a schedule be submitted to the residential college dean’s office. 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.

REQUIREMENTS OF THE MAJOR

STANDARD MAJOR

Prerequisite PSYC 110

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

Specific course required PSYC 200

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&DSS 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 400–480 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  MCDB 120 or BIOL 101 and 102; E&EB 122 or BIOL 103 and 104; PSYC 160 or 170; PSYC 200; PSYC 230L, 260, 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 for PSYC 160 or 170; or MCDB 320 and 321L for PSYC 230L, 260, or 270; 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

FACULTY OF THE DEPARTMENT OF PSYCHOLOGY

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

Assistant Professors  Arielle Baskin-Sommers, Steve Wohn Chang, Molly Crockett, Yarrow Dunham, Dylan Gee, Maria Gendron, Avram Holmes, Julian Jara-Ettinger

Lecturers  Jennifer Hirsch, Kristi Lockhart, Mary O’Brien, Matthias Siemer

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 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  Nancy 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 126b, 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 127a or b / CHLD 127a or b / EDST 127a or b, 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  Nancy 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  Natalia Córdova Sánchez
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 140, Developmental Psychology ]

**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 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 161b / NSCI 161b, Drugs, Brain, and Behavior**  
Hedy Kober  
An introduction to psychoactive drugs and their effects on both brain and behavior. Review of pharmacological and brain mechanisms of different classes of legal, illegal, and medicinal drugs, including alcohol, caffeine, tobacco, stimulants, depressants, antidepressants, and hallucinogens. Individual drugs’ pharmacokinetics, mechanisms of action, dosing, routes of administration, and patterns and effects of use and misuse. Some attention to substance use disorders/addictions, prevention, and treatment.  
SO

**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 180b / EDST 180b, Abnormal Psychology**  
Jutta Joormann  
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 200b, Statistics**  
Staff  
Measures of central tendency, variability, association, and the application of probability concepts in determining the significance of research findings.  
QR

* **PSYC 229Lb / NSCI 229Lb, Laboratory in Human Neuroscience**  
Gregory McCarthy  
Introduction in the acquisition and analysis of human neuroscience data. This laboratory complements the lecture course "Methods in Human Neuroscience" (PSYC 230/NSCI 240). The main topics include structural, diffusion, and functional magnetic resonance imaging (MRI), electroencephalography (EEG), and event-related potentials. Students engage in laboratory exercise that illustrate the design and analysis of experiments using each technique. These laboratory exercises involve acquiring, visualizing, and analyzing MRI and EEG data.  
Prerequisites: PSYC 160/NSCI 160, PSYC 200, PSYC 230/NSCI 240, or permission of the instructor.  
SC RP ½ Course cr

**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.  
WR, SO

**PSYC 250b, Research Methods in Clinical Psychology**  
Arielle Baskin-Sommers  
Introduction to the underpinnings, processes, and methods of scientific research utilized in clinical psychology. Rationale for various methods, generating and testing hypotheses, nonhuman animal models, laboratory and applied studies, assessment methods, ethical issues, protection of participants, and research findings in relation to public life and policy.  
WR, SO

[ PSYC 258, Computational Methods in Human Neuroscience ]

[ PSYC 303, Social Neuroscience ]

* **PSYC 310b / CGSC 310b / PHIL 305b, Philosophy for Psychologists**  
Joshua Knobe  
Introduction to frameworks developed within philosophy that have applications in psychological research. Principal topics include the self, causation, free will, and morality. Recommended preparation: a course in philosophy or psychology.  
HU, SO

**PSYC 315b, 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 321b / NSCI 346b, Psychopharmacology  Thomas Brown
Study of therapeutic and recreational drugs that affect the central nervous system and influence mood, cognition, perception, and behavior. Drugs considered vary from psychotropics to hypnotics to narcotics. Prerequisite: PSYC 160 or 170 or equivalent, or permission of instructor.  SC

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 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 329b / LING 146b, Language, Sex, and Gender  Natalie Weber and Claire Bowern
Sex-based asymmetries in language structure and language use. Role of language in encoding, reflecting, or reinforcing social attitudes and behavior. The "he/man" lexicon: sex-marking, reform, and resistance. Gender and sexual diversity as linguistic variables. Genderlects: differences (real and perceived) between male and female speech, conversational styles, and linguistic communities.  SO  RP

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

* PSYC 334a / CHLD 334a, Developmental Psychopathology  Fred Volkmar, Eli Lebowitz, and Denis Sukhodolsky
Study of developmental psychopathology during childhood and adolescence, team taught by a child psychiatrist and three psychologists. Topics include: aspects of normal development, assessment methods, clinical disorders, treatment, and legal and social policy issues. Review of normative development, followed by discussion of theoretical approaches to understanding developmental aspects of common mental health conditions in childhood. Attention to treatment models as well as relevant issues of culture and ethnicity in the expression of psychopathology. Prerequisites: PSYC 130, 140, 180, or equivalent, or with permission of instructor.  SO

PSYC 335b / NSCI 340b, Cognitive Neuroscience  Steve Wohn 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 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 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 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.  SC

[ PSYC 355, Clinical Psychology in the Community ]

* PSYC 372a / LING 490a, Research Methods in Linguistics  Raffaella Zanuttini
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.
The basic facts, general principles, and theories that describe how higher animals, from mice to humans, are changed by their experiences. The historically separate fields of learning and memory research desegregated under a neuroscientific perspective that recognizes the evolutionary continuity among higher animals. Prerequisite: Introductory courses in biology and psychology, or permission of instructor. SC, SO

[ PSYC 405, Social Emotions ]

* PSYC 409a, Science of Free Will  
Thomas Brown
The scientific facts and arguments behind the theory that free will is an illusion or invalid construct. Implications of this theory for religion, law, and morality. Supporting evidence drawn from the fields of psychology, neuroscience, genetics, physics, and complex adaptive systems. SO

[ PSYC 411, Systems Neuroscience ]

* PSYC 416a, The Psychology of Group Life  
Yarrow Dunham
Study of social categorization, the psychological tendency to partition individuals into groups, with attention to cognitive, developmental, social, and evolutionary approaches. The nature and development of social categorization, including its evolutionary advantages and its relation to the phenomenon of categorization more broadly. Ways in which social categorization influences prejudice and discriminatory behavior; methods for reducing such negative effects. Prerequisites: PSYC 110 and permission of the instructor. SO

* PSYC 417a, Etiology and Treatment of Addictions  
Arielle Baskin-Sommers
Research from the fields of cognitive neuroscience, psychology, sociology, and public health on the etiology and treatment of addictions. Social, neurobiological, and genetic explanations for addiction; evaluation of addiction treatments; the social construction of substance policies. SO

* PSYC 419b / CGSC 419b / NSCI 419b, Topics in Brain Development, Law, and Policy  
BJ Casey
Healthy development is a fundamental right of the individual, regardless of race, ethnicity, socioeconomic status, or gender. Youth require special protections of their rights due to vulnerabilities related to their physical and mental immaturity. These rights include, not only protections, but opportunities for building the cognitive, emotional, and social skills necessary for becoming a healthy adult and a contributing member of society. This seminar examines the extent to which legal policies and practices in the treatment of youths are consistent with scientific knowledge on psychological and brain development. Each class discusses one or more legal cases highlighted in the context of brain and psychological science and current laws and policies. Prerequisite: PSYC 110 and PSYC 160 preferred. SO

* PSYC 420b / CGSC 420b / NSCI 420b, Topics in Clinical Neuroscience  
Avram Holmes
An overview and examination of the neuroscience of psychiatric illness. We focus on cutting-edge research in humans and animals aimed at understanding the biological mechanisms that underlie psychiatric illness. Although these questions date back to early philosophical texts, only recently have experimental psychologists and neuroscientists begun to explore this vast and exciting domain of study. We discuss the evolutionary and developmental origins of individual differences in human personality, measurement issues, fundamental dimensions of psychopathology, stability/plasticity, heritability, and implications therapeutic interventions as well as the associated broader implications for public policy. A major focus is on the neurobiology of fear and anxiety, including brain circuits, molecular genetic pathways, and epigenetics. A secondary focus is on differences in behavior and biology that confer risk for the development of depression and addiction, including the biological systems involved in hedonic pleasure, motivated goal pursuit, and the regulation of impulses in the face of everyday temptation. Students should have some background in psychology; PSYC 110 and PSYC 160 preferred. SO

* PSYC 422a / CGSC 422a / NSCI 422a, 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
Relations between family and disorders such as schizophrenia, depression, anorexia nervosa, and criminality. Family therapy approaches and techniques.

* **PSYC 493a or b, Directed Research**  Jutta Joormann
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**  Jutta Joormann
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.