COGNITIVE SCIENCE (CGSC)

CGSC 110a / PSYC 130a, 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.  

CGSC 175a, The Mystery of Sleep  
Meir Kryger and Suman Baddam  
The role in which sleep and circadian rhythms affect attention, cognition, and memory through multidisciplinary consideration of neurobiology, epidemiology, and humanities. Psychological aspects of sleep; sleep disorders; sleep deprivation; and the history of sleep in philosophy, literature, and art. This course is not open to students previously enrolled in CSPC 350, CSMC 370, or CSYC 390.  

CGSC 216b / LING 116b / PSYC 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.  

CGSC 275b / LING 275b / PHIL 280b, Pragmatics  
Laurence Horn  
Speakers often mean things they don’t say, but how does a hearer figure out what the speaker meant? Which sentences are designed to change the world rather than just to represent it? How are sentences used to mean different things in different contexts? Pragmatics explores the relations between what is said and what is meant, focusing on how speech acts and the principles of “street logic”—presuppositions and implicatures—help speakers and hearers shape the landscape of a conversation. No formal prerequisites, but some familiarity with linguistics or philosophy of language will help on some of the readings.  

CGSC 282b / PHIL 182b / PSYC 182b, Perspectives on Human Nature  
Joshua Knobe  
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.  

CGSC 325a / NSCI 325a / PSYC 325a, 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. Prerequisites: PSYC 110, PSYC 160.  

* CGSC 352a / PHIL 352a, Junior Colloquium in Cognitive Science  
Staff  
Survey of contemporary issues and current research in cognitive science. By the end of the term, students select a research topic for the senior essay. Enrollment limited to Cognitive Science majors.  

* CGSC 410b / NSCI 410b / PSYC 410b, 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.  

* CGSC 420b / NSCI 440b / PSYC 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.  

* CGSC 427b / PSYC 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.

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

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

* CGSC 471a and CGSC 472b, Directed Research in Cognitive Science Staff
Research projects for qualified students. The student must be supervised by a member of the Cognitive Science faculty, who sets the requirements and directs the research. To register, a student must submit a written plan of study to the director of undergraduate studies and the faculty supervisor. The normal minimum requirement is a written report of the completed research, but individual faculty members may set alternative equivalent requirements. Only one term may be offered toward the major, with permission of the director of undergraduate studies; two terms may be offered toward the bachelor’s degree.

* CGSC 473a and CGSC 474b, Directed Reading in Cognitive Science Staff
Individual study for qualified students who wish to investigate an area of cognitive science not covered in regular courses. The student must be supervised by a member of the Cognitive Science faculty, who sets the requirements and meets regularly with the student. To register, a student must submit a written plan of study to the director of undergraduate studies and the faculty supervisor. The normal minimum requirement is a term paper, but individual faculty members may set alternative equivalent requirements. Only one term may be offered toward the major, with permission of the director of undergraduate studies; two terms may be offered toward the bachelor’s degree.

* CGSC 491b, Senior Project Staff
A research colloquium leading to the completion of the senior essay. Students attend regular colloquium presentations. Enrollment limited to Cognitive Science majors.

* CGSC 492b / HUMS 424b / PHIL 492b / PSYC 424b, Metaphysics Meets Cognitive Science: Objects, Causation, Time, and Self Laurie Paul and Brian Scholl
The premise (and promise) of cognitive science is that we will come to understand ourselves better by integrating the insights and contributions from multiple fields of inquiry. This interdisciplinary project has been especially vibrant when it has explored the intersection of philosophy and psychology (for example when work in ethics integrates empirical work from moral psychology, or when work in the philosophy of mind integrates neuroscientific studies of consciousness). But cognitive science has interacted far less with the study of *metaphysics*—the philosophical exploration of topics such as time, causation, and possibility. This may seem surprising, since there has been a great deal of fascinating empirical research on the mental representations and cognitive processes involved in such topics. Accordingly, this seminar attempts to bridge this gap, exploring potential interactions between these fields. In particular, we explore the possibility of a ‘cognitive metaphysics’, in which each field is enriched by consideration of the other. How might metaphysical theories raise questions or identify concepts of interest to working cognitive scientists? How might empirical studies from cognitive science on the nature of seeing and thinking contribute to the study of metaphysics? Specific topics likely include the ways in which we understand the nature (in both the mind and the world) of space, time, objects, events, causality, persistence, and possibility. (And along the way, we also consider some more particular topics, such as the asymmetry between past and future experience, the apparent backwards causation in the context of Newcomb’s puzzle, and why the present seems special.) This course is the Shulman Seminar. A previous course other in either philosophy or psychology is presumed.