Department of Psychology

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• Howard C. Nusbaum
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• Norman M. Bradburn
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• Jerre Levy
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• John A. Lucy, Comparative Human Development
• Martha McClintock
• David McNeill
• Joel M. Pokorny, Ophthalmology and Visual Science
• Vivianne Smith, Ophthalmology and Visual Science
• Nancy Lou Stein

Department website: http://psychology.uchicago.edu

Originally founded as the Laboratory of Psychology in 1893, the Department of Psychology has been for a century a leading center of scholarship, research and teaching in psychology and related fields. Among its distinguished faculty and students have been James Rowland Angell, John Dewey, George Herbert Mead, John
Department of Psychology

B. Watson, the founder of behaviorism, L. L. Thurstone, a pioneer in psychological measurement, Karl Lashley, Klüver and Bucy, Kleitman, discoverer of REM sleep, Frank Beach, founder of behavioral endocrinology, W. C. Allee who viewed biology as a social phenomenon, and Roger Sperry, Nobel Prize winner for his work in cerebral lateralization. The present Department of Psychology is conscious of its distinguished intellectual forebears and continues to reflect its heritage in its commitment to research, the scope of its inquiry, and the diversity of its programs of graduate study.

The Department of Psychology is organized into specialized programs that reflect the contemporary state of the discipline and the wide-ranging interests of its own faculty. The areas of concentration are cognition, computational cognitive neuroscience, developmental psychology, integrative neuroscience, and social psychology. Consistent with the multidisciplinary traditions of the University of Chicago, many faculty members serve on more than one of the department's programs. Faculty and students participate in courses, colloquia, workshops and joint research ventures with scholars in other departments. These include biology, computer science, education, human development, linguistics, neuroscience, philosophy, and others, as well as the University's professional schools of business, public policy, law, medicine, and social service administration.

Doctoral study in the University of Chicago's Department of Psychology typically spans five years and includes a common curriculum of eight courses with other requirements set by the student's area of specialization. In addition, each student will complete a trial research project under the guidance of a faculty advisor or advisors, and complete a dissertation. Students are evaluated yearly to determine progress. Advisors are a critical component of students' experience in the doctoral program, providing guidance and collaboration in conducting research and academic advising.

DEGREES

Programs of graduate study offered by the department lead to the PhD degree at the University of Chicago. The Department of Psychology does not offer courses of study leading to the degree of Master of Arts (MA). However, students admitted to doctoral study may take the MA degree as an optional step in the doctoral program. Similarly, a student admitted who must leave the program, for whatever reason, may apply for a terminal MA degree, providing the student has met the program requirements of the particular program of the Department of Psychology.

PSYCHOLOGY-LINGUISTICS JOINT PHD PROGRAM

Students in the Department of Linguistics in the Division of the Humanities who wish to work toward a joint PhD in Psychology's Cognition Program and in Linguistics must be admitted to the Department of Psychology through the Division of the Social Sciences.

PSYCHOLOGY-BUSINESS JOINT PHD PROGRAM

The Joint Program in Psychology and Business was established in 2009, and is overseen jointly by the Behavioral Science dissertation area (https://www.chicagobooth.edu/phd/dissertation-areas/behavioral-science/) at Chicago Booth and the Department of Psychology. The aim of this program is to connect the large number of social, cognitive, and organizational psychologists at Chicago Booth and within the Department of Psychology. To qualify for the joint program, a student must be admitted into either the Psychology or the Business graduate program. PhD students in Psychology or Business who want to take the Joint Degree will need an adviser in both schools. The adviser from the program the student was initially admitted into will be a primary adviser and the one from the other program, the secondary adviser. Normally this would be done, after arrival, during the first year of studies. Once the student and the faculty member agree on the advising relationship, and after successfully completing at least one year in the primary program, the student applies to the secondary program. The application is then reviewed by the faculty in the program that the student wants to join.

ADMISSION

Students are admitted by application to the Department of Psychology to pursue courses of doctoral study that are formulated by the individual programs. Candidates for admission are expected to have some background in psychology as well as mathematics and statistics.

The application process for admission and financial aid for the Psychology graduate program is administered through the Dean of Students Office in the Division of the Social Sciences. The application for admission, with instructions, deadlines and department-specific information, is available online at: http://apply-ssd.uchicago.edu/apply/.

GENERAL REQUIREMENTS FOR DOCTORAL STUDENTS

All doctoral students in the Department of Psychology must complete the common graduate curriculum. In addition, each student must complete the course requirements specified by one of the department's specialized training and research programs. In exceptional cases, a student may design an individual sequence of courses.
This sequence must be approved by the curriculum and student affairs committee before the student undertakes it. Completion of these course requirements is a prerequisite for Ph.D. candidacy.

Practical pedagogical experience is a program requirement in the doctoral program. Students in the Department of Psychology will be required to complete five mentored teaching experiences (MTEs), with the possibility of additional teaching experiences for those students seeking advanced pedagogical training. These experiences may include being a Course TA, a Course Intern (for College Core courses), and/or a Mentored Instructor of a stand-alone course (when applicable).

**COMMON GRADUATE CURRICULUM**

The common curriculum consists of eight courses. Other requirements for graduate students will be set by the student’s area of specialization.

**Proseminar**

One-quarter course in which faculty members whose primary affiliation is the Department of Psychology give a summary of their ongoing research and students write a research proposal, to be submitted for an NSF graduate fellowship if the student is eligible for this funding. Professional development topics are also covered.

Statistics Requirement: Three courses passed with a grade of B or better

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credits</th>
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<tbody>
<tr>
<td>STAT 22000</td>
<td>Statistical Methods and Applications (or BUSN 41000 or equivalent approved by the Graduate Curriculum Committee. More advanced courses, for which these courses are prerequisites, also fulfill this requirement.)</td>
<td>100</td>
</tr>
<tr>
<td>PSYC 37300</td>
<td>Experimental Design and Statistical Modeling I</td>
<td>100</td>
</tr>
<tr>
<td>PSYC 37900</td>
<td>Experimental Design and Statistical Modeling II</td>
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**TRIAL RESEARCH SEMINAR**

All graduate students are required to take the trial research seminar in the spring of the first year. The purpose of this seminar is to help students formulate and complete their trial research projects.

**BREADTH REQUIREMENT**

Students are required to take a minimum of three doctoral level courses in Psychology, extending across different areas of psychological science. These courses should be chosen in consultation with the student’s advisor and program area. These courses must be passed with a grade of B or better.

**DEPARTMENT OF PSYCHOLOGY RESEARCH REQUIREMENTS**

**TRIAL RESEARCH PROJECT**

Each student will complete a trial research project under the guidance of a faculty advisor or advisors by the end of the spring quarter of the second year.

At the start of the project, each student must form a trial research committee, composed of three faculty members. Typically, the chair of the committee is the student’s primary research advisor. The chair of the committee must be a faculty or emeritus faculty member in the Psychology Department. At least one other member of the committee must be a faculty, emeritus faculty or affiliated faculty member in the Psychology Department. The third member of the committee may be from outside of the Psychology Department, provided that the chair of the trial research committee gives his or her approval.

By the end of autumn quarter of the second year, the student’s trial research committee should meet to approve the proposed trial research project. At a minimum, this meeting consists of a student presentation of the proposed work and discussion of the plan with the committee. Essential to this approval is the committee’s decision that the project can feasibly be completed by the end of the second year.

By the end of spring quarter of the second year, students must submit their written trial research paper to their committee, in preparation for the trial research defense meeting. By the end of spring quarter, students should defend their trial research project at a meeting with their trial research committee, which will also assess the depth and breadth of students’ knowledge of their research problem.

Successful completion of the trial research project is a prerequisite for PhD candidacy.

**DISSERTATION**

To begin the dissertation process, a student must form a three-member dissertation committee consisting of a chairperson and two other faculty members. Typically, the chair is the student’s primary research advisor. The chair of the dissertation committee must be a faculty or emeritus faculty member in the Psychology Department. At least one other member of the committee must be a faculty, emeritus faculty or affiliated faculty member in the Psychology Department. The third member of the committee must be from the University of Chicago, but may be from outside of the Psychology Department, provided that the chair of the dissertation committee gives his or her approval.

Once a dissertation committee exists, the student must formulate an independent research project to be carried out under the committee’s guidance. The student will then prepare a written dissertation proposal and
submit it to his or her committee. When the student’s advisor agrees, the student may schedule an oral defense of the proposal.

To be admitted to PhD candidacy, a student must have successfully completed: (a) the Common Graduate Curriculum (including the statistics and breadth requirement); (b) the course requirements specified by a program or an individual course of study approved by the Curriculum Committee; (c) a trial research project; (d) approval of the dissertation proposal by all members of the student’s dissertation committee following the oral defense.

The completed thesis must be submitted to all three committee members. When the student’s advisor agrees, the student may schedule an oral defense of the dissertation. The oral exam is administered by four members of the University community: the three members of the dissertation committee and an outside reader. The outside reader may be a faculty member at the University of Chicago, or a scientist at another institution. The outside reader must be approved by the thesis advisor. If, after the oral defense, all committee members approve the thesis, the student has met the Psychology Department’s requirements for the PhD degree.

The completed dissertation must be formatted and submitted to the dissertation office by the quarterly deadline for graduation established by the dissertation office. For information about formatting the dissertation and submission deadlines, please visit the dissertation office’s website (https://www.lib.uchicago.edu/research/scholar/phd/).

 Areas of Specialization

The Department of Psychology is organized into five areas of specialization: Cognition, Computational Cognitive Neuroscience, Developmental Psychology, Integrative Neuroscience, and Social Psychology.

Cognition Program

The goal of the doctoral program in Cognitive Psychology is to train graduate students to be well-rounded researchers and scholars. Our unique approach fosters integrative thinking that crosses disciplinary boundaries, and focuses on research questions that have both theoretical and practical significance. Faculty, students, and post docs collaborate on projects spanning a variety of cognitive domains, such as human memory, language and communication, perception, attention and action, and conflict resolution and negotiation. Not only do we focus on fundamentally cognitive questions, but we also situate these questions within a broader context, including the biological bases and the social manifestations of cognitive phenomena. Our integrative approach allows graduate students to benefit from the university as a whole, by interacting with faculty from the Biological Sciences, the Humanities and the Social Sciences.

Curriculum

There are three elements in the graduate curriculum of the Cognition Program. 

1. Departmental curriculum. Students must complete the departmental core graduate curriculum.

2. Basic courses. Three basic courses. The following list includes possible courses, including those that are not offered every year. The purpose of this requirement is to develop a deeper understanding of the theories and methods used to scientifically study cognition, and how these approaches are central to many areas of psychological inquiry. Pre-approved courses are:
   - PSYC 31200 Systems Neuroscience
   - PSYC 37400 Long Term Memory
   - PSYC 38655 Environmental Neuroscience
   - PSYC 40107 Behavioral Neuroscience
   - PSYC 41115 Social Cognitive Development
   - PSYC 42350 Advanced Topics in Human Neuroimaging
   - PSYC 42570 Integrating the Real World into Perception and Memory
   - PSYC 42950 Memory and Decision Making
   - PSYC 43200 Seminar in Language Development

   Students may also propose other courses, based on course offerings in a given year. Such student-proposed courses should be approved by the cognition area chair prior to taking them.

3. Advanced courses and seminars. Students are strongly encouraged to participate in advanced courses and seminars, particularly in their area of interest.
The Computational Cognitive Neuroscience Program

The brain, and particularly the human/primate brain, is arguably one of the most complex systems in the known universe. Huge progress has been made in the fields of Psychology and Neuroscience to understand the workings of the brain and its relationship to behavior. With the advent of new imaging technologies to record non-invasively and at much lower cost, datasets at huge scales are available to researchers across the world. At the same time, behavioral data from social media, cellphone, and credit cards are accessible at unprecedented temporal and spatial scales with millions and even billions of datapoints. Coupled with these enormous and complex datasets, the analysis tools to analyze these data have also become more complex, such as deep neural networks, Bayesian networks and Boltzmann machines. The Computational Cognitive Neuroscience program provides the requisite skills to become proficient at handling these large and complex data, along with the complex computational analysis tools needed to make progress in our understanding of brain and behavior. The Computational Cognitive Neuroscience graduate program at the University of Chicago is designed to provide the training and research opportunities for the next generation of computational cognitive neuroscientists. The program will provide students with training in basic neuroscience, cognition and computational techniques to tackle the incredible and daunting challenge in trying to understand such a complex system and complex multidimensional behavior.

Curriculum

1. Students must complete the Common Graduate Curriculum (https://psychology.uchicago.edu/content/phd-curriculum/) in Psychology.
2. Students must take PSYC 43030 Introduction to Psychoinformatics: Computer Science for Psychologists (offered in 2024-25); this requirement will be waived if student has sufficient programming experience.
3. Two Core Neuroscience courses. From the four options below, students should complete two courses.
   - CPNS 30000 Cellular Neurobiology
   - CPNS 30107 Behavioral Neuroscience
   - CPNS 30116 Survey of Systems Neuroscience
   - CPNS 34231 Methods in Computational Neuroscience
4. Three advanced courses, one of which will be required to be a breadth course outside of the student's main discipline. Eligible courses will include all graduate level seminars taught by faculty in the Psychology Department, as well as a list of courses in other departments that are deemed relevant for the computational cognitive neuroscience curriculum. These outside courses will provide additional opportunities for computational and analytic training.

Below is a list of the “advanced courses” in computational cognitive neuroscience students can choose from in Psychology (note this is not a complete list). Computational courses offered by other programs (MACS, CPNS) may also meet these requirements.

- PSYC 31900 The Neuroscience of Narratives. (Leong)
- PSYC 32750 Advanced Topics in Chronobiology. (Prendergast)
- PSYC 34133 Neuroscience of Seeing. (Wei, Maunsell, Sherman, Shevell)
- PSYC 34810 Neuroeconomics. (Bakkour)
- PSYC 37400 Long Term Memory. (Gallo)
- PSYC 37250 Foundations of Neuroscience: Historical Perspective. (Kay)
- PSYC 41210 Psychophysiology: Methods, Concepts, and Applications. (Norman)
- PSYC 42350 Advanced Topics in Human Neuroimaging (Bainbridge, Rosenberg)
- PSYC 42570 Integrating the Real World into Perception and Memory. (Bainbridge)
- PSYC 42650 Working Memory. (Awh)
- PSYC 42950 Memory and Decision Making (Bakkour)
- PSYC 43110 Affective Neuroscience. (Norman)
- PSYC 43130 Stress and the Social Brain (Norman)
- PSYC 43780 Basics of conducting EEG and ERP research. (Vogel)
- PSYC 43910 Current Topics in Working Memory and Attention (Vogel)
- PSYC 44550 Cognitive Neuroscience Core Course (Awh/Vogel)
- PSYC 45500 Cognitive and Social Neuroscience of Aging. (Gallo)
- PSYC 46050 Principles of Data Science and Engineering for Laboratory Research (Yu)

The Developmental Psychology Program

The Developmental Program provides a rich environment for scientific inquiry, mentorship, and training. Our faculty pursue a wide range of topics that span cognitive, emotional and social development. In cognitive development, our work focuses on infants' and children's mathematical, spatial, and language development along with interventions to improve educational outcomes. In terms of social and emotional development, we examine infants' and children's affective, intentional, and moral understanding. Other research examines how interacting with their environment affects children's cognition and social behavior, and how their bodies can shape learning and thinking. Not only do our faculty, post-docs, and students investigate multiple exciting questions with behavioral methods, but they also supplement this approach with other
methods including behavioral economics, gestural analyses, functional MRI, eye tracking, and EEG/ERPs. Moreover, the faculty interact with faculty from other disciplines, bringing rich interdisciplinary expertise to bear on their research questions. The faculty are also involved with the Science of Learning Center (https://scienceoflearning.uchicago.edu/), Center for Gesture Sign and Language (https://gslcenter.uchicago.edu), Committee on Education (https://coe.uchicago.edu), and the Child Neurosuite (http://www.childneurosuite.org/). These diverse perspectives and methodologies provide a comprehensive picture of how the mind works and is shaped throughout development.

Curriculum

1. The following requirements are in addition to the common Graduate Curriculum required of all graduate students.

2. Students must take an advanced course in the three areas of Developmental Psychology listed below. Certain seminars may also fulfill these requirements. Below are a few examples of courses that will fulfill these requirements. Students may petition the developmental area chair to count courses not included on this list.

   a) Cognitive/Intellectual Development:
   - PSYC 42550 Topics in Cognitive Development; PSYC 32450 Seminar on Mathematical Development;
   - PSYC 33600 Cognition in Infancy
   b) Language Development:
   - PSYC 43200 Seminar in Language Development; PSYC 43680 Topics in Language and Gesture
   c) Social/Emotional Development:
   - PSYC 41115 Social Cognitive Development; PSYC 33165 Multidisciplinary Perspectives on Morality;
   - PSYC 32220 Understanding Inequality as a Psychologist

3. Students are expected to attend the weekly developmental brown bag seminar (Topics in Developmental Psychology) each quarter.

4. Students are encouraged to take additional coursework in areas of interest and in statistics or methods as needed.

5. In their third year, students will present their trial research findings in the developmental brown bag seminar.

6. By the spring of the third year students must write and submit a theoretical review paper to their adviser and a reader. Ideally, this review could be a publishable article, suitable for a journal such as Psychological Bulletin or Developmental Review and will help in formulating the dissertation. Students will do a presentation of the theoretical review paper in the developmental brown bag seminar by the end of their fourth year.

INTEGRATIVE NEUROSCIENCE

The notion that 100 billion neurons give rise to human behavior proved daunting up through the 20th Century because neuroscientists were limited by existing technologies to studying the properties of single neurons or small groups of neurons. Characterizing simple neural circuits has led to an understanding of a variety of sensory processes, such as the initial steps in vision, and motor processes, such as the generation of locomotion patterns. However, unraveling the neural substrates of more complex behaviors, such as the ability to pay attention to relevant events in its surroundings or the ability to understand the likely events going through the mind of another, remains one of the major challenges for the neurosciences in the twenty-first century. In contrast to simple behaviors, these complex behaviors depend on interactions within a network of different brain structures. Studying the neural bases of complex behaviors, thus, requires an integrative neuroscience approach.

The Integrative Neuroscience graduate program at the University of Chicago is designed to provide the training and research opportunities for the next generation of behavioral, cognitive, and social neuroscientists. Behavioral, cognitive, and social neuroscience represent three complementary and partially overlapping aspects of this integrative neuroscience of mind and behavior. Behavioral neuroscience places an emphasis on the biological mechanisms underlying basic behavioral processes; cognitive neuroscience places an emphasis on the biological mechanisms underlying cognition, with a specific focus on the neural substrates of mental processes and their behavioral manifestations; and social neuroscience places an emphasis on the biological mechanisms underlying social processes and behavior, including the ability to perceive and communicate mental states including the beliefs and desires of others and to form and maintain interpersonal and group relationships. The University of Chicago is optimally positioned to meet this challenge because its unique academic structure facilitates interactions across disciplinary perspectives.

Curriculum

Students must complete the departmental core graduate curriculum.

As part of this curriculum and with one additional course, IN students complete:
TWO PSYCHOLOGY DEPARTMENT BREADTH COURSES

IN students will take two advanced courses within the Department of Psychology.

TWO OF THREE CORE NEUROSCIENCE COURSES

CPNS 30000 Cellular Neurobiology
CPNS 30107 Behavioral Neuroscience
CPNS 30116 Survey of Systems Neuroscience

It is suggested that most students take at least Cellular and Behavioral, but we understand that needs depend on research focus.

IN students are encouraged to take additional advanced courses. The program offers the following advanced courses. All of these courses will not be offered every year.

- PSYC 32750 Advanced Topics in Chronobiology
- PSYC 31900 The Neuroscience of Narratives
- PSYC 34133 Neuroscience of Seeing
- PSYC 36655 Advanced Topics in Epigenetics of the Brain
- PSYC 37250 Foundations of Neuroscience: Historical Perspective
- PSYC 37400 Long Term Memory
- PSYC 41210 Psychophysiology: Methods, Concepts, and Applications
- PSYC 42350 Advanced Topics in Human Neuroimaging
- PSYC 42650 Working Memory
- PSYC 42950 Memory and Decision Making
- PSYC 43110 Affective Neuroscience
- PSYC 43130 Stress and the Social Brain
- PSYC 43780 Basics of conducting EEG and ERP research
- PSYC 34810 Neuroeconomics
- PSYC 43910 Current Topics in Working Memory and Attention
- PSYC 44550 Cognitive Neuroscience Core Course
- PSYC 45500 Cognitive and Social Neuroscience of Aging
- PSYC 46050 Principles of Data Science and Engineering for Laboratory Research

THE SOCIAL PSYCHOLOGY PROGRAM

The general philosophy of the curriculum is to provide students with the requisite knowledge and skills to excel in mainstream, academic social psychology. In addition to Departmental requirements, graduate students in the University of Chicago Social Psychology Program must fulfill the following course requirements:

1. General Courses:
   a. PSYC 40600 Advanced Seminar in Social Psychology: Introductory course in experimental social psychology. This course will also fulfill part of the core course requirements of the common graduate curriculum.

2. Topics in Experimental Social Psychology: An ongoing seminar taught collectively by the Core Faculty each quarter. Required of Social Area Students in Years 1-3. Please note: This course is neither required of Joint students nor is it available to them.

3. An advanced course or seminar in at least two of the following Areas of Emphasis:
   - Self
   - Social Cognition
   - Social and Cognitive Neuroscience
   - Decision Making
   - Attitudes and Affect
   - Stereotyping and Prejudice
   - Communication and Language Processes
   - Interpersonal Relations and Group Processes
   - Political Psychology
   - Cultural Psychology
4. PSYC 45200 Advanced Methods In Experimental Social Psychology plus two additional courses in advanced methods and statistics.

5. Finally, students are expected to take advanced courses and seminars in their area of interest.

PSYCHOLOGY COURSES

PSYC 30401. Psycholinguistics: Language Processing. 100 Units.
This is an advanced introduction to the field of psycholinguistics. We will do an in-depth overview of both the empirical findings and the methodologies used on various topics in language comprehension/production, including areas of speech perception, lexical processing, syntactic parsing, and semantic/pragmatic processing. Models at both the computational and the mechanistic levels will also be examined.
Equivalent Course(s): LING 30401

PSYC 30510. Computing for the Social Sciences. 100 Units.
This is an applied course for social scientists with little-to-no programming experience who wish to harness growing digital and computational resources. The focus of the course is on learning the basics of programming and on generating reproducible research. Topics include coding concepts (e.g., data structures, control structures, functions, etc.), data visualization, data wrangling and cleaning, version control software, exploratory data analysis, etc. Students will leave the course with basic computational skills implemented through many methods and approaches to social science; while students will not become expert programmers, they will gain the knowledge of how to adapt and expand these skills as they are presented with new questions, methods, and data. The course will be taught in R.
Equivalent Course(s): PLSC 30235, MAPS 30500, ENST 40176, MACS 20500, SOSC 26032, CHDV 30511, MACS 30500, SOCI 20278

PSYC 30550. From Data to Manuscript in R. 100 Units.
This course tackles the basic skills needed to build an integrated research report with the R programming language. We will cover every step from data to manuscript including: Using R’s libraries to clean up and reformat messy datasets, preparing data sets for analysis, running statistical tools, generating clear and attractive figures and tables, and knitting those bits of code together with your manuscript writing. The result will be a reproducible, open-science friendly report that you can easily update after finishing data collection or receiving comments from readers. Never copy-paste your way through a table again! The R universe is large, so this course will focus specifically on: The core R libraries, the tidyverse library, and R Markdown. Students will also learn about the use of GitHub for version control.
Equivalent Course(s): MAPS 30550, MACS 30550, PSYC 20550, CHDV 20550, CHDV 30550

PSYC 31000. Perspectives In Drug Abuse. 100 Units.
TBD
Equivalent Course(s): CHDV 32900, NPHP 32900

PSYC 31200. Systems Neuroscience. 100 Units.
This course meets one of the requirements of the neuroscience specialization. This course introduces vertebrate and invertebrate systems neuroscience with a focus on the anatomy, physiology, and development of sensory and motor control systems. The neural bases of form and motion perception, locomotion, memory, and other forms of neural plasticity are examined in detail. We also discuss clinical aspects of neurological disorders.
Equivalent Course(s): PSYC 24000, BIOS 24205

PSYC 31510. Neuroscience of Communication. 100 Units.
We will read and discuss communication and how various kinds of communication are mediated by neural systems. The course will cover theories, methods, and empirical findings in communication neuroscience. Topics will include speech and language, emotional information, face perception, gesture, and music.
Equivalent Course(s): PSYC 21510, NSCI 22500

PSYC 31600. Biopsychology of Sex Differences. 100 Units.
This course will explore the biological basis of mammalian sex differences and reproductive behaviors. We will consider a variety of species, including humans. We will address the physiological, hormonal, ecological and social basis of sex differences. To get the most from this course, students should have some background in biology, preferably from taking an introductory course in biology or biological psychology.
Equivalent Course(s): GNSE 30901, CHDV 30901, EVOL 36900

PSYC 31661. Current Controversies in Psychological Science. 100 Units.
Is there a unique crisis in the replicability of psychological research? Are findings in social psychology particularly at risk? Are findings in cognitive neuroscience also being questioned? If so, why? This is the most recent controversy in psychological science which we will discuss along with the question of whether there are psychological traits, how we can understand evolution in psychological science, the role of experience vs. biological endowment and what this contrast means, whether there are fixed limits to working memory capacity and whether training can change these, how exposure to violence affects aggressive behavior. We will read and discuss theory and evidence about ongoing and recent controversies in psychological science and consider how such controversies might be resolved.
PSYC 31700. Developmental Biopsychology. 100 Units.
An introduction to the reciprocal interactions among biology, psychology, and social interactions over the course of development, from conception through puberty, adult development, aging, and mortality. A lecture course incorporating the experimental and human clinical literature, set in a developmental and comparative context.
Equivalent Course(s): CHDV 32201

PSYC 31755. Longitudinal Research. 100 Units.
This course will introduce students to longitudinal research methods used in psychological research. This includes both the design of longitudinal studies and the use of statistical techniques to analyze longitudinal data. Students will gain experience with reading longitudinal research reports using longitudinal data and develop the skills necessary to conduct and report on their own longitudinal research.
Equivalent Course(s): MAPS 31755, PSYC 21755, SOCI 30338, CHDV 31755

PSYC 31900. The Neuroscience of Narratives. 100 Units.
Narratives have a powerful hold over the human mind. People are more often convinced by a compelling story than by concrete facts. More broadly, people use narratives to organize their thoughts and communicate their ideas. Recent advances in natural language processing (NLP) tools and neuroscience methods provide exciting new opportunities to study how the brain understands and constructs narratives. The goal for this seminar is to provide an in-depth look into the cutting-edge research on the neuroscience of narratives. We will begin with a review of the burgeoning literature on the use of narratives in cognitive and social neuroscience. We will then introduce NLP approaches that provide a framework to model narratives computationally, and discuss how NLP models can be combined with neuroscience measures in a synergistic manner. Finally, we will discuss how studying the neuroscience of narratives can provide insights into people's mental models of the world. This class is designed as a graduate seminar, however, advanced undergraduate students with backgrounds in either cognitive neuroscience or natural language processing can register with instructor consent.

PSYC 32220. Understanding Inequality as a Psychologist. 100 Units.
Inequality within and across social groups has risen sharply in the past few decades. What are the early traces and psychological mechanisms of this pervasive phenomenon? In this seminar, we will discuss these questions from multiple angles, integrating developmental, social and cognitive psychology. Specifically, this course will cover topics in early social cognition, including social categorization, essentialism, structural reasoning, normative reasoning, stereotypes and prejudice, etc. Students will evaluate past studies throughout the course and propose original research at the end.
Equivalent Course(s): PSYC 22220, EDSD 32220, EDSO 22220

PSYC 32300. Cognitive and Social Neuroscience. 100 Units.
TBD

PSYC 32350. Sex Differences in the Human Brain from DNA to Human Culture. 100 Units.
This graduate seminar provides a foundation and a critical overview of theories and empirical research in neuroscience and psychology on sex differences, as well as their implications for medicine, health, education and public policy.
Equivalent Course(s): GNSE 32350

PSYC 32411. Mediation, Moderation, and Spillover Effects. 100 Units.
This course is designed for graduate students and advanced undergraduate students from social sciences, statistics, health studies, public policy, and social services administration who will be or are currently involved in quantitative research. Research questions about why an intervention works, for whom, under what conditions, and whether one individual's treatment could affect other individuals' outcomes are often key to the advancement of scientific knowledge yet pose major analytic challenges. This course introduces cutting-edge theoretical concepts and methodological approaches with regard to mediation of intervention effects, moderated intervention effects, and spillover effects in a variety of settings. The course content is organized around six case studies. In each case, students will be involved in critical examinations of a working paper currently under review. Background readings will reflect the latest developments and controversies. Weekly labs will provide supplementary tutorials and hands-on experiences with mediation and moderation analyses. All students are expected to contribute to the knowledge building in class through participation in discussions. Students are encouraged to form study groups, while the two written assignments are to be finished and graded on an individual basis.
Equivalent Course(s): CCTS 32411, EDSD 32411, CHDV 32411, SOCI 30318, PBPL 29411, STAT 33211

PSYC 32450. Seminar on Mathematical Development. 100 Units.
We will examine the development of numerical and spatial skills in young children, which have been found to predict their long term mathematical outcomes. The course will examine the role of children's early mathematical skills and concepts, domain general abilities such as executive functioning and math attitudes (e.g., math anxiety, math ability self-concepts, mindset, and math gender stereotypes) on their math learning trajectories. Finally, we will consider how key socializers - parents and teachers - contribute to children's math learning and math attitudes.
Equivalent Course(s): PSYC 22450
PSYC 32750. Advanced Topics in Chronobiology. 100 Units.
This seminar will explore the mechanisms by which circadian clocks influence the development and adult functioning of the brain to generate adaptive changes in behavior. In addition to being immersed in theoretical aspects of chronobiology, students will be trained in critical reading of primary research literature, the construction of testable hypotheses, and designing experiments to test these hypotheses. In addition to participating in weekly discussions, course members will survey the literature to determine how circadian issues affect how research is conducted across disciplines.

PSYC 32950. Emergence and Development of Mathematics and Language. 100 Units.
We will discuss the emergence and development of mathematics and language in humans. Among the topics we will discuss are the universality and variation of the development of these systems as well as their resilience in the face of biological and input variations.
Equivalent Course(s): EDSO 22950, CHDV 32950, CHDV 22950, EDSO 32950, PSYC 22950

PSYC 33000. Cultural Psychology. 100 Units.
There is a substantial portion of the psychological nature of human beings that is neither homogeneous nor fixed across time and space. At the heart of the discipline of cultural psychology is the tenet of psychological pluralism, which states that the study of “normal” psychology is the study of multiple psychologies and not just the study of a single or uniform fundamental psychology for all peoples of the world. Research findings in cultural psychology thus raise provocative questions about the integrity and value of alternative forms of subjectivity across cultural groups. In this course we analyze the concept of “culture” and examine ethnic and cross-cultural variations in mental functioning with special attention to the cultural psychology of emotions, self, moral judgment, categorization, and reasoning.
Equivalent Course(s): CRES 21100, CHDV 31000, ANTH 35110, GNSE 21001, PSYC 23000, KNOW 31000, CHDV 21000, AMER 33000, ANTH 24320, GNSE 31000

PSYC 33150. Methods in Child Development Research. 100 Units.
This course engages with one current topic (the topic differs each year) from research on child social and/or language development. We will read and discuss a collection of research studies related to this topic to gain familiarity with its primary questions, theories, and methods. We will also, together as a class, conduct a replication of an experiment- or recording-based research study related to the topic. Students should be prepared to read and discuss scientific research articles and to do hands-on research activities. Students will complete the class with expertise on the topic of focus, including experience with its associated methods.
Equivalent Course(s): EDSO 33150, CHDV 33150, CHST 23150, EDSO 23150, PSYC 23155, CHDV 23150, CHDV 33150

PSYC 33165. Multidisciplinary Perspectives on Morality. 100 Units.
Morality is essential for societal functioning and central to human flourishing. People across all cultures seem to have the same sense about morality. They simply know what morality is, often without being able to concretely define what exactly it means to label something as a moral kind. But when one tries to more precisely and scientifically define what morality is, things become less clear and more complex. As we’ll see in the class, the field of morality is incredibly dynamic and characterized more by competing theories and perspectives than by scientific consensus. The past decades have seen an explosion of theoretical and empirical research in the study of morality. Amongst the most exciting and novel findings and theories, evolutionary biologists and anthropologists have shown that morality has evolved to facilitate cooperation and social interactions. Developmental psychologists came up with ingenious paradigms, demonstrating that some elements underpinning morality are in place much earlier than we thought in preverbal infants. Social psychologists and behavioral economists examine the relative roles of emotion and reasoning, as well as how social situations affect moral or amoral behavior. Social neuroscientists are mapping neural and hormonal mechanisms implicated in moral decision-making. The lesson from all this new knowledge is clear: moral cognition and behavior cannot be separated from biology, human development, culture, and social context.
Equivalent Course(s): PSYC 23165, KNOW 33165

PSYC 33360. Methods in Gesture and Sign Language Research. 100 Units.
In this course we will explore methods of research used in the disciplines of linguistics and psychology to investigate sign language and gesture. We will choose a set of canonical topics from the gesture and sign literature such as pointing, use of the body in quotation, and the use of non-manuals, in order to understand the value of various effective methods in current use and the types of research questions they are best equipped to handle.
Equivalent Course(s): LING 33360, LING 23360, CHDV 23360, PSYC 23360, CHDV 33360

PSYC 33550. The Psychopath: Mad or Bad? What We Can Learn About Morality By Studying Psychopathy. 100 Units.
Psychopathy can be considered as a disorder of the moral brain, because individuals with psychopathic traits seem to have the cognitive capacity to understand right from wrong but don’t care. They also exhibit a flagrant disregard for social and moral norms. Individuals with psychopathy provide “natural experiments” to examine the psychological and biological mechanisms involved in moral cognition and behavior.
PSYC 33600. Cognition in Infancy. 100 Units.
In this course, we explore the development of human perceptual, cognitive, motor, and social abilities during the first two years of life. The study of infants provides a window into issues of nature and nurture, and the ways in which structure in the organism and structure in the environment converge in developing systems. We cover both classical and current models, giving special attention to the role of changing empirical methods in informing theory.
Equivalent Course(s): PSYC 23600, EDSO 33600, EDSO 23600

PSYC 33660. The Psychopathic Mind: Mad or Bad? 100 Units.
This course introduces students to research into clinical neuroscience and psychiatric research and theories of psychopathy, as well as their implications for the justice system. Is psychopathy best described as a discrete category or a dimensional construct? Is psychopathy a disorder or an adaptation? What neural mechanisms underlie the various atypical aspects associated with psychopathy? Can psychopathy be detected in young children? Is antisocial behavior central to psychopathy or merely an epiphenomenon that is neither diagnostic of psychopathy nor specific to personality deviation? What can we learn about morality by studying psychopathy? Do individuals with psychopathy lack the ability to make moral judgment, or lack moral motivation? Should they be morally and legally responsible for their criminal behavior? Should the behavioral manifestations of psychopathy, such as the potential for danger or recidivism, be aggravating factors in sentencing?

PSYC 33720. Crosslinguistic Perspectives on Language Development. 100 Units.
This discussion-based course covers cross-linguistic evidence concerning similarities and dissimilarities in how children learn language across diverse language communities. Each year will revolve around a central topic. This year we will focus on the acquisition of phonology.
Equivalent Course(s): PSYC 23720, CHDV 23700, CHDV 33700, LING 33700, LING 23701

PSYC 33750. Seminar: Skill Acquisition and Sensorimotor Learning. 100 Units.
Skill acquisition has been studied scientifically for well over a hundred years although the vast majority of memory research focuses on learning facts and declarative memory. This seminar will examine how we learn skills both the kind we use routinely without much thought such as walking and language use and the kind that represent expertise resulting from practice and experience. We will read and discuss the research literature on the cognitive and neural mechanisms underlying sensorimotor learning. We will consider specific topics such as the interaction of sensory systems and motor systems in learning and the role of sleep in consolidation of learning.
Course requirements will include class presentations of research papers, weekly writing assignments, and a final paper.
Equivalent Course(s): EDSO 33750

PSYC 33830. Attention and Working Memory in the Mind and Brain. 100 Units.
This course will provide a broad overview of current work in psychology and neuroscience related to attention and working memory. We will discuss evidence for sharp capacity limits in an individual’s ability to actively monitor and maintain information in an "online" mental state. Readings will be primarily based on original source articles from peer-reviewed journals, with a focus on behavioral and neural approaches for measuring and understanding these basic cognitive processes.
Equivalent Course(s): NSCI 21600, PSYC 23820

PSYC 33960. Biological Rhythms and Behavior. 100 Units.
TBD

PSYC 34050. Understanding Wisdom. 100 Units.
Thinking about the nature of wisdom goes back to Aristotle and has changed in many ways over the history of thought. However, in modern times the term “wisdom” has appeared less in popular discourse except as a synonym for being “smart” or “clever.” This course examines the basic question of how wisdom has been defined and how the definition has changed. We examine whether wisdom really exists or whether it is simply a creation of mythology or fiction or wishful thinking. Further, the course considers whether and how wisdom can be studied scientifically, that is, how it can be measured and experimentally manipulated. Readings are drawn from philosophy, classics, history, behavioral economics, neuroscience, and psychology. In addition to considering the theoretical concept of wisdom and how it can be studied scientifically, the course explores how concepts of wisdom can be applied in business, education, medicine, and the law. We conclude by discussing the notion of how practical wisdom can be applied in daily life to increase human flourishing.

PSYC 34060. Understanding Practical Wisdom. 100 Units.
Thinking about the nature of wisdom goes back to the Greek philosophers and the classical religious sages, but the concept of wisdom has changed in many ways over the history of thought. While wisdom has received less scholarly attention in modern times, it has recently re-emerged in popular discourse with a growing recognition of its potential importance for addressing complex issues in many domains. But what is wisdom? Is it often used with a meaning more akin to “smart” or “clever.” Is it just vast knowledge? This course will examine the nature of wisdom-how it has been defined in philosophy and psychological science, how its meaning has changed, and what its essential components might be. We will discuss how current philosophical and psychological theories conceptualize wisdom and consider whether, and how, wisdom can be studied scientifically; that is, can wisdom be measured and experimentally manipulated to illuminate its underlying mechanisms and understand its functions? Finally, we will explore how concepts of wisdom can be applied in business, education, medicine, the
law, and in the course of our everyday lives. Readings will be drawn from a wide array of disciplines including philosophy, classics, history, psychology, behavioral economics, medicine, and public policy. The course will include lectures by philosophers and psychologists. This course is offered in association with the Chicago Moral Philosophy Project and the Good Life program (the Hyde Park Institute).

Equivalent Course(s): PSYC 24060, CHDV 24050, BPRO 24050, RLST 24055

PSYC 34066. Understanding the Foundations of Wisdom. 100 Units.
Thinking about the nature of wisdom goes back to the Greek philosophers and the classical religious sages, but the concept of wisdom has changed in many ways over the history of thought. While wisdom has received less scholarly attention in modern times, it has recently re-emerged in popular discourse with a growing recognition of its potential importance for addressing complex issues in many domains. But what is wisdom? Is it often used with a meaning more akin to “smart” or “clever”. Is it just vast knowledge? This course will examine the nature of wisdom-how it has been defined, how its meaning has changed, and what its essential components might be. We will examine how current psychological theories conceptualize wisdom and consider whether, and how, wisdom can be studied scientifically; that is, can wisdom be measured and experimentally manipulated to illuminate its underlying mechanisms and understand its functions? Finally, we will explore how concepts of wisdom can be applied in business, education, medicine, the law, and in the course of our everyday lives. Readings will be drawn from a wide array of disciplines including philosophy, classics, history, psychology, behavioral economics, medicine, and public policy.

Equivalent Course(s): PSYC 24066

PSYC 34100. Psychoneuroimmunology. 100 Units.
This course covers all aspects of neuroimmunoendocrinology at the molecular, cellular, and organismal and social levels.

Equivalent Course(s): BPRO 44140, BPRO 24200, PSYC 24150, BIOS 02370

PSYC 34133. Neuroscience of Seeing. 100 Units.
This course focuses on the neural basis of vision, in the context of the following two questions: 1. How does the brain transform visual stimuli into neuronal responses? 2. How does the brain use visual information to guide behavior? The course covers signal transformation throughout the visual pathway, from retina to thalamus to cortex, and includes biophysical, anatomical, and computational studies of the visual system, psychophysics, and quantitative models of visual processing. This course is designed as an advanced neuroscience course for undergraduate and graduate students. The students are expected to have a general background in neurophysiology and neuroanatomy.

Equivalent Course(s): CPNS 34133, NURB 34133, NSCI 22400, BIOS 24133, PSYC 24133

PSYC 34500. Developmental and Neuroscience Perspectives on Social Cognition. 100 Units.
In this course we explore social cognition from two perspectives: developmental psychology and social developmental neuroscience. We aim to discuss existing points of contact between the two literatures, as well as places where points of contact might be made. Topics include (though are not limited to) theory of mind, agency, intentionality, empathy, morality, social categorization, and prejudice.

PSYC 34810. Neuroeconomics. 100 Units.
In this seminar, we will review recent research spanning across the fields of neuroscience, psychology, and economics that inform our understanding of how the brain makes decisions. We will focus on the neural processes that give rise to choice behavior in different contexts. Topics include decisions that are based on learned rewards and punishments, decisions under risk and uncertainty, social preferences, and strategies in games.

PSYC 34910. Empathy: Mechanisms and Functions. 100 Units.
Empathy plays a crucial role in human, social, and psychological interaction during all stages of life. Empathy is a dynamic interpersonal process that involves cognitive, motivational, and affective dimensions. This course invites students to critically explore the science of empathy by examining its scope and its limits. It delves into cutting-edge research from social psychology, behavioral economics and social neuroscience to illuminate the mechanisms underlying feeling for and feeling with others.

Equivalent Course(s): PSYC 24910

PSYC 35000. Physiology Of Vision. 100 Units.
TBD

Equivalent Course(s): PSYC 25000, BIOS 22248

PSYC 35201. Communication in humans and non-humans. 100 Units.
This seminar will compare communication in humans and non-humans. Topics to be covered include the reliance of communication on more general cognitive processes, the learnability of communicative systems, referential intent, honest signaling, and deception. These issues will be explored through readings that cover recent work at the intersection of human and animal communication.

Equivalent Course(s): CHDV 35201

PSYC 36030. Introduction to Python. 100 Units.
This course introduces you to basic computer programming principles and their application to common problems in laboratory research. We will focus on the programming language python. Over a series of lectures
and try-it-yourself sessions, you will learn to use Python to process, analyze, and plot data. The course is designed for students with little to no background in computer programming but wish to use it to ask research questions in the behavioral and biological sciences.

PSYC 36210-36211. Mathematical Methods for Biological Sciences I-II.

PSYC 36210. Mathematical Methods for Biological Sciences I. 100 Units.
This course builds on the introduction to modeling course biology students take in the first year (BIOS 20151 or 152). It begins with a review of one-variable ordinary differential equations as models for biological processes changing with time, and proceeds to develop basic dynamical systems theory. Analytic skills include stability analysis, phase portraits, limit cycles, and bifurcations. Linear algebra concepts are introduced and developed, and Fourier methods are applied to data analysis. The methods are applied to diverse areas of biology, such as ecology, neuroscience, regulatory networks, and molecular structure. The students learn to implement the models using Python in the Jupyter notebook platform.
Equivalent Course(s): BIOS 26210, CPNS 31000

PSYC 36211. Mathematical Methods for Biological Sciences II. 100 Units.
This course is a continuation of BIOS 26210. The topics start with optimization problems, such as nonlinear least squares fitting, principal component analysis and sequence alignment. Stochastic models are introduced, such as Markov chains, birth-death processes, and diffusion processes, with applications including hidden Markov models, tumor population modeling, and networks of chemical reactions. In computer labs, students learn optimization methods and stochastic algorithms, e.g., Markov Chain, Monte Carlo, and Gillespie algorithm. Students complete an independent project on a topic of their interest.
Equivalent Course(s): CPNS 31100, BIOS 26211

PSYC 36212. Mathematical Methods for Biological Sciences III. 100 Units.
This course covers basic mathematical probability, probability distributions, correlation, principal and independent component analysis, and stochastic processes. Stochastic behavior is ubiquitous at all levels of biology, and examples range from electrophysiology to bioinformatics. In labs, students use stochastic models to model and analyze these systems.
Equivalent Course(s): BIOS 26212, CPNS 31200

PSYC 36455. Relationships and Health: The Need to Belong. 100 Units.
This seminar will explore the theory that the need to belong is a fundamental human motivation. In our discussions of relevant psychology journal articles, we will examine the connections between relationships and health, the need to belong is related to empathy, reactions to rejection, and substitutes for belonging.
Equivalent Course(s): MAPS 26455, CHDV 36455, MAPS 36455

PSYC 36520. Mind, Brain and Meaning. 100 Units.
What is the relationship between physical processes in the brain and body and the processes of thought and consciousness that constitute our mental life? Philosophers and others have puzzled over this question for millennia. Many have concluded it to be intractable. In recent decades, the field of cognitive science—encompassing philosophy, psychology, neuroscience, computer science, linguistics, and other disciplines—has proposed a new form of answer. The driving idea is that the interaction of the mental and the physical may be understood via a third level of analysis: that of the computational. This course offers a critical introduction to the elements of this approach, and surveys some of the alternative models and theories that fall within it. Readings are drawn from a range of historical and contemporary sources in philosophy, psychology, linguistics, and computer science. (B) (I)
Equivalent Course(s): PHIL 26520, LING 26520, COGS 20001, PHIL 36520, LING 36520, PSYC 26520, NSCI 22520

PSYC 36555. Advanced Topics in Epigenetics of the Brain. 100 Units.
Once considered a domain of cancer, we now recognize that epigenetic processes affect neurodevelopment, cognitive processes, mental disorders, and behavior. Epigenetic mechanisms are those that alter the function of the genome without altering the base sequence of genomic DNA (the As, Cs, Ts, and Gs we are familiar with), thus can be flexibly modified in response to the environment. In this seminar, we will explore a variety of epigenetic modifications, consider how they encode personal and transgenerational experiences, and examine how they direct brain function and behavior. Behavior can be understood on multiple levels and timescales; we will employ knowledge from the emerging field of epigenetics to shed more light into the black box of behavior.
Equivalent Course(s): CHDV 36555

PSYC 36750. Socio-ecological Psychology. 100 Units.
This is an advanced seminar in social psychology and explores the ways in which socio-ecological factors such as residential mobility, income inequality, and geography affect individuals’ thoughts, feelings, and actions, and the way in which individuals’ thoughts, feelings, and actions help create particular socio-ecological conditions.
Equivalent Course(s): PSYC 26750

PSYC 37250. Foundations of Neuroscience: Historical Perspective. 100 Units.
This course is a seminar-based study of the history of Neuroscience by close reading of the original papers. We will study the famous debates in Neuroscience: The Neuron Doctrine, the Soup vs. Sparks Debate, and the current debate on whether coding is an appropriate metaphor for brain function. We will also read important works in the history of behaviorism and cognitive maps. We will view the older debates in a modern context and
reexamine whether they are as settled as they appear to be. We will read works by Cajal, Golgi, Berger, Adrian, Popper, Eccles, Loewi, Dale, Vogt, Pavlov, Lashley, Skinner, Tolman, Milner, O’Keefe, Hebb, Hubel and Wiesel, Kandel, among others, and more modern works as relevant. PQ: Background in Neuroscience or Biology helpful.

PSYC 37300-37900. Experimental Design I-II.
Experimental Design I-II

PSYC 37300. Experimental Design and Statistical Modeling I. 100 Units.
This course covers topics in research design and analysis. Students will learn the intuitions behind basic statistical models, and learn how to apply them to programming analyses for real psychological data. We will also touch on methods becoming increasingly important in the field, such as machine learning, permutation testing, and data simulation. The course will also discuss the broader landscape of psychology research, including the shift to online experiments, open science, and the replication crisis.

PSYC 37900. Experimental Design and Statistical Modeling II. 100 Units.
In this course you will learn concepts of Bayesian Data Analysis that builds off of Experimental Design and Statistical Modeling I. The course will require knowledge of the R statistical programming language. The relationship between frequentist approaches and Bayesian approaches will be discussed. The course will cover topics such as causal modeling, generalized linear models, markov chain monte carlo, multilevel models (i.e., varying/random intercepts and slopes), and multivariate analysis. The course will be taught from a regression framework. The course will examine both experimental and observational designs and how one can potentially glean causal inferences from observational data.

PSYC 37400. Long Term Memory. 100 Units.
This course surveys the scientific study of human memory, emphasizing both theory and applications. Lectures will cover current research and methods in cognitive psychology and cognitive neuroscience, as well as historical precursors and classic studies. Topics include consciousness and nonconscious processes, corresponding neural systems, and various phenomena such as amnesia, memory distortion, mnemonics, and metacognition.

PSYC 37560. Advances in Memory Manipulation. 100 Units.
This graduate-level seminar explores the science behind the artificial manipulation and control of human cognition. We will focus on the experimental literature from a cognitive neuroscience perspective, including studies on psychopharmacology (drug studies), brain stimulation techniques (e.g., deep-brain stimulation, ECT, tDCS, TMS), and cognitive-behavioral interventions that can affect cognition. We will discuss mechanisms of behavioral impairment and improvement, at both a cognitive and neural level of analysis.

PSYC 37950. Evolution and Economics of Human Behavior. 100 Units.
This course explores how evolutionary biology and behavioral economics explain many different aspects of human behavior. Specific topics include evolutionary theory, natural and sexual selection, game theory, cost-benefit analyses of behavior from an evolutionary and a behavioral economics perspective, aggression, power and dominance, cooperation and competition, biological markets, parental investment, life history and risk-taking, love and mating, physical attractiveness and the market, emotion and motivation, sex and consumer behavior, cognitive biases in decision-making, and personality and psychopathology. Equivalent Course(s): PSYC 27950, CHDV 37950, CHDV 27950, ECON 14810

PSYC 38320. Mechanisms of Motivated Cognition. 100 Units.
How do goals, desires, and needs shape how we perceive and respond to the physical and social world? This seminar examines the myriad of ways motivation influences human cognition, highlighting research from cognitive neuroscience and social psychology. We will explore how motivated cognition gives rise to biases in perception, memory, and decision-making, as well as self-evaluation, person perception, and group dynamics. The class will provide the necessary background for students who wish to take an interdisciplinary approach to study motivation-cognition interactions.

PSYC 38330. Understanding Inequality as a Psychologist. 100 Units.
Inequality within and across social groups has risen sharply in the past few decades. What are the early traces and psychological mechanisms of this pervasive phenomenon? In this seminar, we will discuss these questions from multiple angles, integrating developmental, social and cognitive psychology. Specifically, this course will cover topics in early social cognition, including social categorization, essentialism, structural reasoning, normative reasoning, stereotypes and prejudice, etc. Students will evaluate past studies throughout the course and propose original research at the end.

PSYC 38655. Environmental Neuroscience. 100 Units.
In this course we will be examining how the physical and social environment affects brain and behavior. This course will span biological psychology with non-human animals to large Epidemiological studies examining how environments affect brain and Behavior.

PSYC 38780. Adolescent Development in Context. 100 Units.
This course focuses on developmental pathways from middle childhood through adolescence within the context of school, family, community, and culture. Because human development is an applied field, we will be paying special attention to how sociocultural and historical influences affect academic, socioemotional, and identity development in the context of real-world challenges and opportunities faced by adolescents. In addition to learning about developmental and sociocultural theories, students will apply research to policy and practice.
by creating resources geared toward youth, parents, or those who work with youth. By the end of this course sequence, students should be able to: 1. Describe and apply key theories of middle childhood and adolescent development; 2. Identify developmental opportunities and challenges during middle childhood and adolescence; 3. Discuss the role of identity development in constructing or authoring one’s life story; 4. Reframe adolescent risk-taking as a form of creativity and individual expression; 5. Understand how relationships can influence positive youth development; and 6. Translate theory and research into developmentally appropriate and culturally sensitive resources for youth, families, and those who work with youth.

Equivalent Course(s): EDSO 28700, SSAD 68700, CHDV 48700, EDSO 68700

PSYC 38826. It Goes Without Saying: Conversation in Context. 100 Units.
In everyday conversation, the language we use is part of a larger interactive context. The words we use are neither spoken nor heard in a vacuum. As speakers our bodies, faces, voices, and histories send messages above and beyond the words we choose. In this course we broaden the scope of how we talk about talk, where language is just one of many ways we communicate. We explore how identity, society, and the physical world allow us to make meaning from language using perspectives from linguistics, psychology, and sociology. Over the quarter students will build a multi-modal analysis of a single interaction by examining and reexamining data through lenses such as social distance, barriers to communication, stance-taking, and gesture.

Equivalent Course(s): EDSO 22700, CHDV 22700, MAPS 32700, EDSO 32700

PSYC 38903. Current Topics in Behavioral Science III. 100 Units.
Course Search (https://intranet.chicagobooth.edu/pub/coursesearch/coursesearch/)
Equivalent Course(s): BUSN 38903

PSYC 38960. The Development of Communicative Competence. 100 Units.
This course examines the emergence of communicative skills in humans. We will focus on how children glean information about language structure and language use from their home environments. We will also discuss the proposed cognitive and evolutionary roots of communicative behaviors, with a focus on current gaps in our knowledge and possible pathways forward. The course will consider these issues from multiple perspectives including linguistics, psychology, and linguistic anthropology. We will also briefly cover a range of methods associated with these different areas of study. It is expected that, by the end of the course, you should be able to think and write critically about how human communication and human language are intertwined in both adults and children.

Equivalent Course(s): EDSO 38950, LING 38951, CHDV 38950

PSYC 39019. Theory, Method & Evidence: Finding Persons in the Social. 100 Units.
This course introduces students to the process of examining relationships among theory, evidence, and method in contemporary social science with a particular focus on writings from sociology, social psychology, and developmental psychology. To situate our focus on theory, evidence, and method we will also draw upon history of science and philosophy of science so we can better understand how we produce knowledge via research on people. The construction of person has taken place over the last century, which is a central idea to psychology, sociology and all social sciences. We will examine what social/psychological theory aims to be, what counts as such a theory; relationships between quantitative and qualitative methods; how we produce knowledge via surveys, interviews, ethnographies, and experiments; and how we make evidence (e.g., functional magnetic resonance imaging is evidence of what?). The aim of the course is to better situate students to the range of relevant understandings of social theory, social methods, and social evidence. Doing so puts students in the position to consider evidence from a multitude of perspectives leading to clearer formulations and examinations of the social world (e.g., guides on writing research proposals). Further, students will then consider what the examined relationships mean for social science in an age of changing politics of knowledge, including considerations of the replication crisis in the social sciences, particularly psychology.

Equivalent Course(s): MAPS 41501, SOCI 30333, CHDV 42550, CHDV 22550

PSYC 40107. Behavioral Neuroscience. 100 Units.
This course provides an introduction to neuroethology, examining brain activity relative to behaviors and organisms evaluated from an adaptive and evolutionary perspective. It starts with a brief introduction to classical ethology, and then develops a series of example animal model systems. Both invertebrate and vertebrate models are considered although there is a bias towards the latter. Many of these are “champion” species. There is a heavier demand for reading original data papers than typical in introductory graduate level courses. An integral part of the course is a series of assignments where you develop grant proposals describing novel science experiments in the animal models, thereby challenging your knowledge of the material and teaching aspects of scientific writing. In recent years there has been more computational material presented. The course is not available to undergraduates without prior approval of the instructor.

Equivalent Course(s): NURB 30107, CPNS 30107

PSYC 40300. Advanced Topics in Biological Psychology. 100 Units.
What are the relations between mind and brain? How do brains regulate mental, behavioral, and hormonal processes; and how do these influence brain organization and activity? This course provides an introduction to the anatomy, physiology, and chemistry of the brain; their changes in response to the experiential and sociocultural environment; and their relation to perception, attention, behavior, action, motivation, and emotion.
PSYC 40301. Topics in Psychology. 100 Units.
Current research in psychology.

PSYC 40450-40451-40452. Topics in Cognition I-II-III.
Broadly speaking, this workshop will address fundamental topics in cognitive psychology such as attention, memory, learning, problem solving, and language. One unique aspect of this workshop is that we will not only explore topics central to the study of cognition, but we will also explore how the study of cognitive psychology can be used to enhance human potential and performance in a variety of contexts. These contexts range from an exploration of optimal teaching practices to enhance the acquisition of mathematical knowledge in the classroom, to issues regarding how individuals communicate best to foster the optimal exchange of information in, for instance, medical settings, to the optimal strategies older adults can use to help stave off the deleterious effects of aging on cognitive functioning and the performance of everyday activities.

PSYC 40450. Topics in Cognition I. 100 Units.
Discussion of current research in psychology.

PSYC 40451. Topics in Cognition II. 100 Units.
Discussion of current research in psychology.

PSYC 40452. Topics in Cognition III. 100 Units.
Discussion of current research in psychology.

PSYC 40460. Computation and the Identification of Cultural Patterns. 100 Units.
Culture is increasingly becoming digital, making it more and more necessary for those in both academia and industry to use computational strategies to effectively identify, understand, and (in the case of industry) capitalize on emerging cultural patterns. In this course, students will explore interdisciplinary approaches for defining and mobilizing the concept of “culture” in their computational analyses, drawing on relevant literature from the fields of Anthropology, Psychology and Sociology. Additionally, they will receive hands-on experience applying computational approaches to identify and analyze a wide range of cultural patterns using the Python programming language. For instance, students will learn to identify emerging social movements using social media data, predict the next fashion trends, and even decipher ancient symbols using archaeological databases.
Equivalent Course(s): MACS 40400, CHDV 40404, MACS 20400, MAPS 40401

PSYC 40500. Advanced Seminar in Developmental Psychology. 100 Units.
This is an introductory course for graduate students in developmental psychology. Topics in biological, perceptual, cognitive, social, and language development will be covered. This course will satisfy one of Psychology graduate students' core course requirements.
Equivalent Course(s): CHDV 41603

PSYC 40600. Advanced Seminar in Social Psychology. 100 Units.
This seminar course examines social psychological theory and research based on both classic and contemporary contributions. Among the major topics examined are conformity and deviance, the attitude-change process, social role and personality, social cognition, and political psychology.

PSYC 40710. Early Childhood: Human Capital Development and Public Policy. 100 Units.
The goal of this course is to introduce students to the literature on early child development and explore how an understanding of core developmental concepts can inform social policies. Our substantive foci will be on early childhood poverty, the role of parenting and the home environment in shaping children’s development, and the evidence base for intervention in early childhood for economically disadvantaged children. The course will cover evidence from neuroscience, psychology, economics, sociology, and public policy as it bears on these questions. In particular, we will explore how the principles of early childhood development can guide the design of policies and practices that enhance the healthy development of young children, particularly for those living in adverse circumstances, and thereby build a strong foundation for promoting equality of opportunity, reducing social class disparities in life outcomes, building human capital, fostering economic prosperity, and generating positive social change. In doing so, we will discuss the evidence on whether the contexts of children’s development are amenable to public policy intervention and the costs and benefits of different policy approaches.
Equivalent Course(s): PPFA 40700, CHDV 40770

PSYC 40850. Seminar on Mathematical Development. 100 Units.
We will examine the development of numerical and spatial skills in young children, which have been found to predict their long term mathematical outcomes. The course will examine the role of children’s early mathematical skills and concepts, domain general abilities such as executive functioning and math attitudes (e.g., math anxiety, math ability self-concepts, mindset, and math gender stereotypes) on their math learning trajectories. Finally, we will consider how key socializers - parents and teachers - contribute to children’s math learning and math attitudes.

PSYC 40851-40852-40853. Topics in Developmental Psychology I-II-III.
Brown-bag discussion of current research in psychology.

PSYC 40851. Topics in Developmental Psychology I. 100 Units.
Brown-bag discussion of current research in psychology.
PSYC 40852. Topics in Developmental Psychology II. 100 Units.
Brown-bag discussion of current research in psychology.

PSYC 40853. Topics in Developmental Psychology III. 100 Units.
Brown-bag discussion of current research in psychology.

PSYC 41000. Advanced Topics in Color Vision. 300.00 Units.
TBD
Equivalent Course(s): OPTH 41000

PSYC 41115. Social Cognitive Development. 100 Units.
Human beings inhabit a very complex social world and our mind has structures that enable us to navigate
this complexity. Where do these concerns come from? Are we blank slates that passively absorb cues from our
environment? If not, what early competencies enable us to learn? How do these competencies interact with our
culture? To answer these questions, this class will cover literature from infants, toddlers, children, and adults
to give a rich picture of what changes and remains constant across development. We will cover topics such as
children's understanding of intentions, theory of mind, communication, ownership, morality, and inter-group
attitudes.

PSYC 41135. Electrophysiological tracking of dynamic visual representations. 100 Units.
In this class we will examine the limits of an observer's ability to track items in dynamic visual displays, such as
in a multiple object tracking paradigm. We will focus on behavioral and electrophysiological analyses of these
tasks, with an eye towards characterizing the cognitive capacity limits and the neural signatures that track those
limits.

PSYC 41150. Quantitative Methods in Cognition and Perception. 100 Units.
Theoretical advances in cognition and perception often use quantitative models to develop and test theories.
This course covers a broad range of these methods and models. Topics include signal detection theory,
multidimensional scaling, multidimensional classification analysis, Fourier analysis and wavelet based analysis,
FRI signal processing, graph theory and Bayesian modeling.

PSYC 41210. Psychophysiology: Methods, Concepts, and Applications. 100 Units.
This course will provide an overview of the principles, theory, and applications of psychophysiological research.
The course has two primary goals: (1) to provide an overview of major psychophysiological approaches and
measures through discussion of contemporary research; and (2) to provide an introduction to theory and
research in major areas of human psychophysiology with specific applications to the study of cognition, affect,
and health.

PSYC 41400. Evolutionary Cognitive Psychology. 100 Units.
TBD

PSYC 41450. Evolutionary Psychology. 100 Units.
This course explores human social behavior from the perspective of a new discipline evolutionary psychology. In
this course we will read and discuss articles in which evolutionary theory has been applied to different aspects
of human behavior and social life such as : developmental sex differences, cooperation and altruism, competition
and aggression, physical attractiveness and mating strategies, incest avoidance and marriage, sexual coercion,
parenting and child abuse, language and cognition, and psychological and personality disorders.
Equivalent Course(s): CHDV 27850, CHDV 41451

PSYC 41660. Current Controversies in Cognition. 100 Units.
Nature vs. nurture, conscious and unconscious processing, automaticity and controlled processing, separate or
integrated STM and LTM, modularity, and bottom-up vs. top-down processing are some of the controversies that
continue to be discussed in cognition research. We will read and discuss theory and evidence and consider how
such controversies might be resolved empirically and theoretically.

PSYC 41901. Advanced Topics in Language, Culture and Thought. 100 Units.
This course examines more intensively one or more of the topics discussed in CHDV 31901, Language, Culture,
and Thought. Typically the course will concern the relationship between language developments in middle
childhood and the emergence of higher order social and intellectual skills. Among the topics to be considered
will be the role of language advances (e.g., reported speech, narrative structure, metapragmatics, etc.) in relation
to cognitive growth (formal reasoning, theory of mind, etc.) especially as these relationships are mediated
through institutional structures (e.g., education, standard language, etc.). Readings will include a mix of basic
theory, contemporary literature reviews, and case studies.
Equivalent Course(s): ANTH 47605, CHDV 41900

PSYC 41920. The Evolution of Language. 100 Units.
This course is designed to review critically some of the literature on the phylogenetic emergence of Language, in
order to determine which questions have been central to the subject matter, which ones have recurred the most,
and to what extent the answers to these are now better informed. The class will also review new questions such
as the following: What is the probable time of the emergence of modern language(s)? Should we speak of the
emergence of Language or of languages, in the plural?
PSYC 42040. Seminar: Mathematical Development. 100 Units.
We will review research on young children’s early quantitative development, beginning with infants, and
ending with young elementary grade school aged children. We will cover both numerical and spatial aspects of
mathematics, and will consider the effects of input variations on individual differences.

PSYC 42052. Genes and Environment in Language and Cognitive Development. 100 Units.
Children show tremendous variability in how quickly and how well they learn their native language. Where
does this variability come from? We'll explore both genetic and environmental contributions to language and
cognitive development, aiming for an integrative understanding that moves beyond debates about nature and
nurture. Readings will include work in behavioral genetics, environmental plasticity, niche inheritance, and
cultural evolution and transmission.

PSYC 42100. Trial Research Seminar. 100 Units.
PSYC 42100 is required of first-year Psychology graduate students The purpose of this seminar is to assist
students in formulating their trial research project.

PSYC 42150. Exploration and Learning in Childhood Development. 100 Units.
In this seminar, we will consider both classic and current work on the relation between active engagement
and learning in children. Foundational work in developmental psychology by Piaget, Vygotsky and Dewey
stressed the value of children’s active engagement for their learning and cognitive growth. Current research
offers a new lens on this classic idea, with new research examining the cognitive, neural and cultural factors
that drive children’s learning. The work of the seminar will focus on analysis of primary texts, both classic and
contemporary, to identify the nature, richness and limits of active learning.

PSYC 42220. Understanding Inequality as a Psychologist. 100 Units.
Inequality within and across social groups has risen sharply in the past few decades. What are the early traces
and psychological mechanisms of this pervasive phenomenon? In this seminar, we will discuss these questions
from multiple angles, integrating developmental, social and cognitive psychology. Specifically, this course
will cover topics in early social cognition, including social categorization, essentialism, structural reasoning,
normative reasoning, stereotypes and prejudice, etc. Students will evaluate past studies throughout the course
and propose original research at the end.

PSYC 42225. Event-Related and Oscillatory Analysis Tech w/Human EEG Data. 100 Units.
This course will cover analytic approaches for understanding oscillatory neural activity using human EEG.

PSYC 42250. Event-Related and Oscillatory Analysis Tech w/Human EEG Data. 100 Units.
Advanced seminar on EEG analysis.

PSYC 42260. Seminar on Advanced Topics in EEG Analysis. 100 Units.
Advanced seminar on EEG analysis.

PSYC 42270. Advanced Topics in Electrophysiology I. 100 Units.
Graduate Seminar: Basics of conducting EEG and ERP research EEG recordings are a popular and long-standing
approach to gather information about human brain activity that are used to address questions in many areas of
Psychology. In this seminar, we will cover many of the basics of conducting human EEG research, including basic
principles of recordings (e.g., detection and removal of artifacts, baseline correction, filtering and averaging)
along with basic analytical approaches to measuring EEG (e.g., calculating and measuring ERPs; time-frequency
analyses, etc). We will also cover research that has utilized EEG signals from multiple research domains, with
the aim of giving the student exposure to a wide swath of well characterized neural tools from the existing
literature. Throughout the course, we will emphasize how best to design experiments that can yield robust and
interpretable data and avoid the common pitfalls in using this powerful approach.

PSYC 42271. Advanced Topics in Electrophysiology II. 100 Units.
Advanced seminar on EEG analysis.

PSYC 42272. Advanced Topics in Electrophysiology III. 100 Units.
An advanced seminar on EEG analysis. Please contact instructors for permission to register.

PSYC 42350. Advanced Topics in Human Neuroimaging. 100 Units.
This course will discuss advanced topics in human neuroimaging, reviewing recent papers using state-of-the-art
methods, including multi-voxel pattern analysis, Big Data, connectivity analyses, and inter-subject correlations.
We will discuss how these new methods fit into the current landscape of human neuroscience and support new
theoretical ideas, and also conduct tutorials so students can use these methods in their own analyses.

PSYC 42400. Teaching Psychology. 100 Units.
A seminar on teaching psychology.

PSYC 42500. Attention. 100 Units.
This course will cover basic topics in the area of attention including orienting responses, selective and divided
attention, resource limitations and cognitive load. We will discuss basic research methods in attention,
mathematical and computational models of attention, and neurophysiological research on attention. The course
will consider theoretical controversies and recent advances in our understanding of attention and its role in
cognitive processing.
PSYC 42510. Attention Seminar. 100 Units.
We will read original journal articles on the topic of attention and we will discuss the definition of this construct, the methods used to study it, and the neural basis of this cognitive function.

PSYC 42530. Advanced Topics in Human Neuroimaging. 100 Units.
This course will discuss advanced topics in human neuroimaging, reviewing recent papers using state-of-the-art methods, including multi-voxel pattern analysis, Big Data, connectivity analyses, and inter-subject correlations. We will discuss how these new methods fit into the current landscape of human neuroscience and support new theoretical ideas, and also conduct tutorials so students can use these methods in their own analyses.

PSYC 42550. Topics in Cognitive Development. 100 Units.
In the first years of life, children's cognition undergoes dramatic qualitative and quantitative change. For nearly a century, experimental psychologists have sought to understand the nature and causes of these developmental changes. This course surveys classic and current approaches to the study of cognitive development in infants and children.

PSYC 42570. Integrating the Real World into Perception and Memory. 100 Units.
This seminar will cover the evolution of experimental paradigms in the psychology of perception and memory, from more artificial stimuli to more naturalistic stimuli. The course will focus on readings of papers utilizing new innovations in psychology to make research better mirror the real world. Topics will include virtual reality, movie-watching in neuroimaging, lifelogging, interactive fMRI, gesture recording, and multi-modal experiments to understand perception and memory. Discussions will also include broader meta-discussions about the pros and cons of these more complex, real-world paradigms.

PSYC 42630. fMRI of Person Perception. 100 Units.
This course will explore how we process and respond to the rich array of information conveyed by faces through the methodological lens of function magnetic resonance imaging. Doing so, we will survey the scholarship that spans a range of disciplines (i.e., from cognitive neuroscience to social psychology) to characterize the psychological and biological mechanisms involved in face perception. The course will begin with an introduction to function magnetic resonance imaging and how this methodology can inform person perception. We will then review existing theoretical models of face perception (borrowed from social psychology, cognitive psychology, and neuroscience). Finally, we will explore different aspects of face perception, including face encoding, social categorization, and emotion and race perception. The purpose of this class is to provide an integrative survey of research from these different domains that is relevant to the broad topic of how we perceive and form impressions of others from faces.

PSYC 42650. Working Memory. 100 Units.
This course will cover basic working memory theory, broadly defined, with a focus on neural models.

PSYC 42750. Advanced Topics in Chronobiology and Behavior. 100 Units.
This course will explore the mechanisms by which circadian and seasonal biological clocks influence the development and adult functioning of the brain, the neuroendocrine system, and the immune system, all within the context of adaptive changes in behavior. In addition to being immersed in theoretical aspects of chronobiology, students will be trained in critical reading of primary research literature, the construction of testable hypotheses, and designing experiments to test these hypotheses. We will also discuss features of the scientific process that allow rapid progress in developing a scientific field.

Equivalent Course(s): NURB 32750

PSYC 42950. Memory and Decision Making. 100 Units.
What are the cognitive and neural mechanisms by which learning, memory, and decision making interact? In this seminar, we will review current theories that bridge learning and decision making, consider the strengths and weaknesses of the cognitive neuroscience tools used to test these theories, and discuss how memories of the past enable decisions for the future.

PSYC 43030. Introduction to Psychoinformatics: Computer science for Psychologists. 100 Units.
This course introduces you to basic computer programming principles and their application to common problems in Psychology research such as creating simple experiments, data acquisition, and basic analysis. We will focus on the high-level programming language Python. Over a series of lectures and try-it-yourself sessions, you will learn to use Python to display stimuli and record responses, process, analyze, and plot data. The course is designed for students with little to no background in computer programming but wish to take advantage of the power it affords to ask research questions in the behavioral and biological sciences.

PSYC 43110. Affective Neuroscience. 100 Units.
This course aims to provide an overview of and historical basis for the study the neural mechanisms of emotion. Emphasis will be on mapping affective experience and behavior to brain function, including multilevel integration of social, psychological, neurobiological, and genetic data. Readings will come from the current literature. Course requirements include in-depth weekly discussion of assigned readings and a final paper.

PSYC 43130. Stress and the Social Brain. 100 Units.
This course explores the topic of social stress and its influence on behavior and neurobiology. The course will provide in-depth coverage of the psychophysiology of the stress response and how it is modulated across social contexts. The material in the course will be presented in a seminar-style format. The primary goal of the course...
PSYC 43150. The Moral Brain. 100 Units.
The past decade has seen an explosion of empirical research in the study of morality. Amongst the most exciting and novel findings and theories, evolutionary biologists and comparative psychologists have shown that moral cognition has evolved to facilitate cooperation and smooth social interactions, and that certain components of morality are present in non-human animals. Developmental psychologists came up with ingenious paradigms, demonstrating that the elements that underpin morality are in place much earlier than we thought, and clearly in place before children turn two. Social neuroscientists have begun to map brain circuits implicated in moral decision-making and identify the contribution of neuropeptides to moral sensitivity. Changes in the balance of brain chemistry, or in connectivity between regions can cause changes in moral behavior. The lesson from all this new knowledge is clear: human moral behavior cannot be separated from human biology, its development, and past evolutionary history. As our understanding of the human brain improves, society at large, and justice and the law in particular, are and will be increasingly challenged. The goal of this seminar is to provide an overview of the current research on the moral brain, and examine this fascinating topic from a range of relevant interdisciplinary perspectives.

PSYC 43165. Homo Moralis: Multidisciplinary Perspectives in Morality. 100 Units.
The past decade has seen an explosion of empirical research in the study of morality. Amongst the most exciting and novel findings and theories, evolutionary biologists and comparative psychologists have shown that moral cognition has evolved to facilitate cooperation and smooth social interactions, and that certain components of morality are present in non-human animals. Developmental psychologists came up with ingenious paradigms, demonstrating that the elements underpinning morality are in place much earlier than we thought. Social neuroscientists have begun to map brain circuits implicated in social decision-making and identify the contribution of specific neuropeptides to moral sensitivity. Changes in the balance of brain chemistry, and in anatomical connectivity between specific regions can cause drastic changes in moral behavior. The lesson from all this new knowledge is clear: human moral cognition and behavior cannot be separated from biology, its development, and evolutionary history. As our understanding of the human brain improves, society at large, and justice and the law in particular, are and will be increasingly challenged. The intent of this class is to provide an overview of the current theories and research on morality, and examine this fascinating topic from a range of relevant interdisciplinary perspectives. These perspectives include anthropology and philosophy, evolution, development, social neuroscience, psychopathology, and justice and the law.

PSYC 43200. Seminar in Language Development. 100 Units.
Undergraduates should register for PSYC 23200. Psychology and Linguistics doctoral students should register for PSYC 43200. This course addresses the major issues involved in first-language acquisition. We deal with the child’s production and perception of speech sounds (phonology), the acquisition of the lexicon (semantics), the comprehension and production of structured word combinations (syntax), and the ability to use language to communicate (pragmatics).
Equivalent Course(s): CHDV 41601

PSYC 43250. Readings in Language Acquisition. 100 Units.
How do children learn language? This seminar will explore different ways in which the mind, body, and world constrain how language is acquired and processed. The readings include (but are not limited to) two books: “Creating language: Integrating evolution, acquisition, and processing” by Christiansen & Chater; and “Rethinking Innateness” by Elman et al.
Equivalent Course(s): CHDV 43250

PSYC 43360. Computational Models of Cognition and Development. 100 Units.
Computational models are powerful tool for integrating empirical research, and for making novel predictions about cognition and development. This course will survey computational models of attention, Learning, Decision Making, and Language Processing, aiming to develop students’ understanding of what models are for broadly, as well as what kinds of models are used and useful in their individual research areas.

PSYC 43350. Gesture. 100 Units.
This course will examine the spontaneous movements that we produce when we talk—our gestures. We will first consider what gesture is (and is not), and then explore gesture in relation to communication, thinking, learning, action, and the brain, ending with an exploration of gesture as it becomes language, on-the-spot and over longer periods of time.
Equivalent Course(s): CHDV 43350

PSYC 43600. Processes of Judgement and Decision Making. 100 Units.
This course offers a survey of research on judgment and decision making, with emphasis placed on uncertainty and (intrapersonal) conflict. An historical approach is taken in which the roots of current research issues and practices are traced. Topics are drawn from the following areas: evaluation and choice when goals are in conflict and must be traded off, decision making when consequences of the decision are uncertain, predictive and evaluative judgments under conditions of uncertain, incomplete, conflicting, or otherwise fallible information.
Equivalent Course(s): CHDV 43600
PSYC 43650. The Development of Social Cognition. 100 Units.
This course explores current topics in the development of human social cognition. We will evaluate infants' and children's reasoning about other individuals -- including those individuals minds, their relationships, and their social identities -- with the goal of exploring the developmental origins and foundations of social cognition. Sample topics include theory of mind, morality, social learning, psychological essentialism, and intergroup attitudes. Particular attention will be given to the relationship of early social processes to those observed in adulthood.

PSYC 43660. Research Topics in Gesture and Learning I. 100 Units.
This course will explore how actions, particularly actions that are used to represent (i.e., gestures), can be used to promote learning in hearing and deaf learners. The course will also explore how gesture (hands used to convey information in a non-codified way) can be distinguished from sign language (hands used to convey information in a codified, linguistic way) at one level, and from action (hands used to manipulate objects and thus change the world in a direct way) at another level. Mechanisms underlying these effects will also be explored; for example, how the hands direct attention and are processed in the brain during learning situations; how the hands change as they become more codified in an emerging language. Permission of the instructor required.
Equivalent Course(s): CHDV 43660

PSYC 43661. Research Topics in Gesture and Learning II. 100 Units.
This course will explore how actions, particularly actions that are used to represent (i.e., gestures), can be used to promote learning in hearing and deaf learners. The course will also explore how gesture (hands used to convey information in a non-codified way) can be distinguished from sign language (hands used to convey information in a codified, linguistic way) at one level, and from action (hands used to manipulate objects and thus change the world in a direct way) at another level. Mechanisms underlying these effects will also be explored; for example, how the hands direct attention and are processed in the brain during learning situations; how the hands change as they become more codified in an emerging language. Permission of the instructor required.
Equivalent Course(s): CHDV 43661

PSYC 43680. Topics in Language and Gesture. 100 Units.
The course will focus on a range of topics in language (discourse, narrative, turn-taking, conversational repair, etc.) and how they interact with co-speech and other nonverbal cues.
Equivalent Course(s): CHDV 43680

PSYC 43690. Topics in Action, Representation, and Gesture. 100 Units.
The course will focus on how movement of the body (including gesture) affects learning, information processing, and representation.
 Equivalent Course(s): CHDV 43690

PSYC 43760. Sensitive Periods: How the Timing of Experience Alters Its Effect. 100 Units.
Sensitive periods are defined as phases in life when experience has the most effect on a particular brain system. Typically occurring during development, experience during sensitive periods has long-term implications for sensory processing, affective development, cognitive processes, and production of complex learned behavior such as language. We will combine an investigation of biological underpinnings with behavioral consequences of sensitive periods and ask questions such as: How are sensitive periods defined during development? Are sensitive periods for a variety of behaviors different or the same? How does experience intersect with the brain to encode and modify a sensitive period? Can we re-open sensitive periods after their normal end - and do we want to? Equivalent Course(s): CHDV 43760, NURB 33760

PSYC 43770. Behavioral Epigenetics: Smol Change w/Big Effect on Brain/Behav. 100 Units.
Once considered a domain of cancer, we now recognize that epigenetic processes affect neurodevelopment, cognitive processes, mental disorders, and behavior. Epigenetic mechanisms are those that alter the function of the genome without altering the base sequence of genomic DNA (the As, Cs, Ts, and Gs we are familiar with), thus can be flexibly modified in response to the environment. In this seminar, we will explore a variety of epigenetic modifications, consider how they encode personal and transgenerational experiences, and examine how they direct brain function and behavior. Behavior can be understood on multiple levels and timescales; we will employ knowledge from the emerging field of epigenetics to shed more light into the black box of behavior.
Equivalent Course(s): CHDV 44770

PSYC 43780. Basics of conducting EEG and ERP research. 100 Units.
EEG recordings are a popular and long-standing approach to gather information about human brain activity that are used to address questions in many areas of Psychology. In this seminar, we will cover many of the basics of conducting human EEG research, including basic principles of recordings (e.g., detection and removal of artifacts, baseline correction, filtering and averaging) along with basic analytical approaches to measuring EEG (e.g., calculating and measuring ERPs; time-frequency analyses, etc). We will also cover research that has utilized EEG signals from multiple research domains, with the aim of giving the student exposure to a wide swath of well characterized neural tools from the existing literature. Throughout the course, we will emphasize how best to design experiments that can yield robust and interpretable data and avoid the common pitfalls in using this powerful approach.
PSYC 43830. Advanced Topics in Working Memory. 100 Units.
Seminar on contemporary topics in working memory research.

PSYC 43910. Current Topics in Working Memory and Attention. 100 Units.
This will cover a broad range of topics in the working memory and attention literature.

PSYC 43921. Current Topics in Working Memory. 100 Units.
This seminar will cover a broad range of topics in the literature on working memory.

PSYC 43980. Psychoneuroimmunology. 100 Units.
The aim of this course is to present some of the basic information necessary to interpret literature in the field of psychoneuroimmunology (PNI). Given the breadth of this line of research, the course is structured to provide students with an overview of several areas central to the field including basic immunology and neurobiology, psychological stress, coping and PNI, immune-mediated alterations in affective and cognitive processes, and PNI processes associated with health and disease. Course requirements include in-depth weekly discussion of assigned readings and a final paper.

PSYC 44000. Moral Psychology and the Anthropology of Morality. 100 Units.
Three types of questions about morality can be distinguished: (1) philosophical, (2) psychological, and (3) epidemiological. The philosophical question asks, whether and in what sense (if any) "goodness" or "rightness" are real or objective properties that particular actions possess in varying degrees. The psychological question asks, what are the mental states and processes associated with the human classification of actions as moral or immoral, ethical or unethical? The epidemiological question asks, what is the actual distribution of moral judgments across time (developmental time and historical time) and across space (for example, across cultures). In this seminar we will read classic and contemporary philosophical, psychological, and anthropological texts that address these questions.
Equivalent Course(s): CHDV 45601

PSYC 44450. Developmental Social Neuroscience. 100 Units.
Establishing and using neurological methods within a developmental framework provides a more complete account of social and cognitive mechanisms, bridging the gap between behaviors and their underlying neural underpinnings. The goal of this class is to provide a background for and to highlight why studying neurological development is important for a full understanding of cognitive and social processing.

PSYC 44460. Advanced Seminar in Social Neuroscience. 100 Units.
This seminar provides an advanced overview of current methodological and theoretical issues central to social neuroscience with an emphasis on fMRI research. Topics will include: the role and function of brain networks believed to support social cognition, neural correlates of person perception and evaluation; and neural regions involved in self-regulation.

PSYC 44550. Cognitive Neuroscience Core Course. 100 Units.
This course will cover broad topics in cognitive neuroscience, including attention, memory, perception, and reasoning. Strong integration of behavioral and neural approaches will be emphasized.

PSYC 44600. Topics in Social Psychology. 100 Units.
Discussion of current topics in Social Psychology.

PSYC 44700. Seminar: Topics in Judgment and Decision Making. 100 Units.
This course offers a survey of research on judgment and decision making, with emphasis placed on uncertainty and (intrapersonal) conflict. An historical approach is taken in which the roots of current research issues and practices are traced. Topics are drawn from the following areas: evaluation and choice when goals are in conflict and must be traded off, decision making when consequences of the decision are uncertain, predictive and evaluative judgments under conditions of uncertain, incomplete, conflicting, or otherwise fallible information.
Equivalent Course(s): CHDV 44700

PSYC 45200. Advanced Methods In Experimental Social Psychology. 100 Units.
The course covers advanced topics in experimental social psychology through the exercise of critiquing and reviewing empirical and conceptual papers in the field.

PSYC 45300. When Cultures Collide: The Multicultural Challenge in Liberal Democracies. 100 Units.
Coming to terms with diversity in an increasingly multicultural world has become one of the most pressing public policy projects for liberal democracies in the early 21st century. One way to come to terms with diversity is to try to understand the scope and limits of toleration for variety at different national sites where immigration from foreign lands has complicated the cultural landscape. This seminar examines a series of legal and moral questions about the proper response to norm conflict between mainstream populations and cultural minority groups (including old and new immigrants), with special reference to court cases that have arisen in the recent history of the United States.
Equivalent Course(s): GSCE 45600, KNOW 45699, CHDV 45699, ANTH 45600, HMRT 35600

PSYC 45320. Experiential Relativity. 100 Units.
What's universal in the human mind, and what is shaped by people's experience of interacting with the physical and social world? In this course we will explore how the diversity of the human experience is reflected in the mind. 20th-century theories of concepts emphasized their innateness and universality, but recent studies show
that people with different patterns of linguistic, cultural, and bodily experience think differently, in predictable ways. By investigating the experiential relativity of the mind, we can uncover universal processes by which people turn their concrete interactions with the environment into abstract thoughts.

**PSYC 45500. Cognitive and Social Neuroscience of Aging. 100 Units.**

As the baby boom generation ages, the rising prevalence of aging-related cognitive decline has become a major challenge for individuals, families and society. However, not all cognitive systems are negatively impacted by aging, and aging also causes complex social and emotional changes. How does aging affect our brains and our minds, and are these changes inevitable? This seminar provides an introduction to the scientific literature of the aging mind, focusing on both normal and pathological (e.g., Alzheimer’s disease) changes in late adulthood. We will cover contemporary research from cognitive and social neuroscience perspectives. Topics include different psychological domains (e.g., attention, memory, metacognition, affective control) and applied issues (e.g., physical exercise, mental training, stereotype threat).

**PSYC 45602. Preparing Research Proposals for Psychologists. 100 Units.**

The course objectives include identifying grant outlets, understanding NSF/NIH grant proposal components, understanding the review process, and learning how to present your research ideas in the context of a grant proposal. We will discuss the components of successful grant proposals, including specific aims, background and significance, research design, and societal impact. The components discussed will be tailored to the F31 and NSF SBE format. Students will spend the initial weeks studying the NIH/NSF review process and then prepare formal written proposals.

**PSYC 45603. Professional Development and the Academic Job Market. 100 Units.**

This course is geared toward senior graduate students with an interest in pursuing the academic job market. Students will work to develop and practice an effective colloquium-length talk, and they will provide and receive feedback from their peers on research and teaching statements.

**PSYC 45650. Language and the Senses. 100 Units.**

Language and sound have obvious interactions, as do language and sight. But there are also surprisingly strong interactions between language and the perception of odors. In this seminar, we will read current and historical literature on the sensory systems and language, including seminal texts in neuroanatomy, neuroimaging, perception, naming of sensory stimuli, sensory attention, and temporal and other properties of sensory systems. Students should have a background in basic neuroscience and be in a graduate program in psychology, neurobiology or a related discipline.

**PSYC 45950. Stereotyping and Prejudice. 100 Units.**

This seminar provides an overview of the literature on stereotyping, prejudice, and discrimination. Topics will include: the formation of stereotypes and prejudice; the processes that underlie stereotyping and prejudice; stereotyping and prejudice from the target’s perspective; and prejudice and stereotype reduction.

Equivalent Course(s): CRES 45950

**PSYC 46050. Principles of Data Science and Engineering for Laboratory Research. 100 Units.**

The quantity of data gathered from laboratory experiments is constantly increasing. This course will explore the latest concepts, techniques and best-practice to create efficient data analysis pipelines. We will focus on the python ecosystem. By the end of the course, you are expected to be able to apply appropriate tools to streamline your own data analysis.

Equivalent Course(s): CPNS 36050, NURB 36050

**PSYC 46661. Advanced Topics in Behavioral Genomics. 100 Units.**

One of the great opportunities in this post-genome age is to use DNA to better understand behavior. It is increasingly obvious that the interactions between genes and behavior are complex. Thus, identifying meaningful connections between them requires careful consideration of both. This seminar course will use primary literature as a platform to consider how behavior is influenced by, and itself alters, the genome, including the epigenome. The course will cover examples from a variety of animals including humans, various methods for measuring the epigenome, genome and behavior, and the relevant neurobiology for each system.

Equivalent Course(s): CHDV 46661, NURB 36661

**PSYC 46662. Advanced Topics in Genes and Behavior. 100 Units.**

There are complex interactions between the genome and behavior. This course will examine how behavior can be understood by investigating the sequence and structure of genes, especially those expressed in the brain. It will consider behaviors in several species (including human), and present various molecular, genetic, and genomic approaches used to uncover how genes contribute to behavior and how behavior alters the genome. Seminar format, with student-led sessions based on primary literature readings, with class time to collectively clarify questions, delve deeper into mechanisms, and integrate to consider broader implications.

Equivalent Course(s): NURB 36660

**PSYC 47001-47002. Language in Culture I-II.**

This two-quarter course presents the major issues in linguistics of anthropological interest. These courses must be taken in sequence.
PSYC 47001. Language In Culture I. 100 Units.
The first quarter of the two-quarter Language in Culture sequence introduces a number of analytic concepts developed out of the study of "language" and its limits. We begin with the study of "interaction order" in its multifunctional complexity, teasing out its constitution through the real-time unfolding of indexical (pragmatic) and reflexive (metapragmatic) signs/functions as coherent "text." We use this attention to the dialectics of indexicality and its various implications to investigate various problematics in the philosophy of language (reference, performativity), linguistics (poetics, grammatical sense, variation, register), and sociocultural anthropology (racialization, relativity, subjectivity/identity, temporality, institutionality).
Equivalent Course(s): CHDV 37201, LING 31100, ANTH 37201

PSYC 47002. Language in Culture II. 100 Units.
This is the second part of a two-quarter sequence on the role of language in social life. Building on the first quarter's focus on the interaction order, this quarter explores how ideologies regiment and reflexively mediate between discursive/expressive practices of the interaction order and the wider organization of social life. How are people's ideas about ways of speaking and modes of expression shaped by their social positions and values? And how do their ideas shape interaction and vice versa? How is difference, in language and in social life, made - and unmade? How and why are some differences persuasive as the basis for action, while other differences are ignored or erased? The course proposes that ideologies are neither true nor false, they are positioned and partial visions of the world, relying on comparison and perspective; they exploit differences in expressive features - linguistic and otherwise - to construct convincing images of people, spaces and activities in sociopolitical processes.
Equivalent Course(s): LING 31200, ANTH 37202, CHDV 37202

PSYC 47500. Survey Questionnaire Design. 100 Units.
The questionnaire has played a critical role in gathering data used to assist in making public policy, evaluating social programs, and testing theories about social behavior (among other uses). This course offers a systematic way to construct and evaluate questionnaires. We will learn to think about survey questions from the perspective of the respondent and in terms of cognitive and social tasks that underlie responding. We will examine the impact of questions on data quality and will review past and recent methodological research on questionnaire development. The course will help students to tell the difference between better and worse types of survey questions, find and evaluate existing questions on different topics, and construct and test questionnaires for their own needs. Prerequisites: Graduate standing (no undergraduate standing). Students enrolled in this class are expected to have completed at least one course on research methods. Some background in psychology is helpful, but it is not required.
Equivalent Course(s): PPHA 41800, SSAD 57500

PSYC 48000. Proseminar in Psychology. 100 Units.
Required of first-year Department of Psychology graduate students. Department of Psychology faculty members present and discuss their research. This introduces new students to the range of research areas in the department.

PSYC 48001-48002-48003. Mind and Biology Proseminar I-II-III.
Seminar series at the Institute for Mind and Biology meets three to four times per quarter. Sign up for three quarters; receive credit at the end of Spring Quarter.

PSYC 48001. Mind and Biology Proseminar I. 000 Units.
Students receive credit in spring quarter after attending 3 quarters of seminars.

PSYC 48002. Mind and Biology Proseminar 2. 000 Units.
Seminar series at the Institute for Mind and Biology meets three to four times per quarter. Sign up for three quarters; receive credit at the end of Spring Quarter.

PSYC 48003. Mind and Biology Proseminar 3. 100 Units.
Seminar series at the Institute for Mind and Biology meets three to four times per quarter. Sign up for three quarters; receive credit at the end of Spring Quarter.

PSYC 48154. Language and Decision Making. 100 Units.
Seminar on language and decision making.

PSYC 48155. The Quest for Interesting Research. 100 Units.
Time is short so we often do what we have to do. This seminar is an opportunity to read the articles we wish we had the time to read not those we have to. We will read an eclectic series of articles. They need not necessarily have a common theme, they will be mostly from psychology, perhaps with relevance to law, perhaps to public policy. We will discuss what makes each article interesting, what makes findings important, how to decide what questions to ask and how to determine in what direction to take a research program. But mainly we will just be reading, discussing and enjoying the quest.

PSYC 48412. Publications, Grants, and the Academic Job Market. 100 Units.
In this graduate seminar we will discuss how to write and publish scientific articles, prepare grant applications, write CVs and job applications, and give job talks and interviews. In other words, everything you always wanted to know about being successful in academia but were afraid to ask.
Equivalent Course(s): CHDV 48412, EVOL 48412
PSYC 48414. Evolution of Human Development. 100 Units.
In this graduate seminar we will read and discuss seminar theoretical and empirical articles that address aspects of human lifespan development from an evolutionary perspective. Topics include: developmental plasticity, life history, sex differences, childhood and juvenility, puberty and adolescence, gene-environment interactions, attachment, parent-offspring conflict, and neurobiological mechanisms.
Equivalent Course(s): CHDV 48414

PSYC 49700. Readings: Psychology. 100 Units.

PSYC 49800. Research: Psychology. 300.00 Units.

PSYC 70000. Advanced Study: Psychology. 300.00 Units.
Advanced Study: Psychology