DEPARTMENT OF PSYCHOLOGY

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• David A. Gallo

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• Jean Decety
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• Susan Goldin-Meadow
• Leslie M. Kay
• Boaz Keysar
• Katherine D. Kinzler
• Susan Cohen Levine
• Daniel Margoliash, Organismal Biology and Anatomy
• Howard C. Nusbaum
• Brian Prendergast
• Steven K. Shevell
• Richard Shweder, Human Development
• Michael Silverstein, Anthropology
• Edward K. Vogel
• Amanda Woodward

Associate Professors
• Marc G. Berman
• Sarah London
• Greg J. Norman

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• Monica Rosenberg
• Alex Shaw
• Jai Yu

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• R. Darrell Bock
• Abraham Bookstein, Humanities Division
• Norman M. Bradburn
• Robert A. Butler, Surgery
• Mihaly Csikszentmihalyi
• Eugene T. Gendlin
• William Goldstein
• Sebastian P. Grossman
• Eric P. Hamp, Linguistics
• Philip W. Jackson, Education
• Jerre Levy
• Frederick F. Lighthall, Education
• John A. Lucy, Comparative Human Development
• Martha McClintock
• David McNeill
• Joel M. Pokorny, Ophthalmology and Visual Science
• Allan Rechtschaffen, Psychiatry
• Milton J. Rosenberg
• Vivianne Smith, Ophthalmology and Visual Science
The primary focus of the study of psychology is on the individual. Thus, its scope includes the biological processes of brain growth, development and functioning; the perceptual and cognitive processes by which information is acquired, stored and communicated; the comprehension, production, and use of language from a psychological viewpoint; the social, cultural, and emotional processes by which experience is interpreted and organized; and the developmental processes that underlie change from infancy through adulthood. Training emphasizes the conceptual theories that describe and explain these processes, and the variety of methods that are used to study them.

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 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.

Moreover, consistent with the interdisciplinary traditions of the University of Chicago, the Department of Psychology maintains close connections with other departments in the University. The department's faculty and students actively participate in courses, colloquia, workshops and joint research ventures with scholars in related departments, including, but not confined to, anthropology, biology, computer science, computational neuroscience, linguistics, neurobiology, and philosophy, and in the University's professional schools of business, public policy, law, medicine, and social service administration.

The Department of Psychology is organized into specialized training and research programs that reflect the contemporary state of the discipline as well as wide ranging interests of its own faculty. They are currently the Cognition Program, the Developmental Psychology Program, the Integrative Neuroscience Program, the Perception Program, and the Social Psychology Program. The interdisciplinary character of the University and the Department of Psychology is reflected in the fact that many faculty members serve on more than one of the department's programs.

DEGREES

The course of study offered by the Department of Psychology is designed primarily to prepare students for careers in research and teaching and for whatever professional work is necessary as an adjunct to these career objectives. Programs of graduate study offered by the department lead to the PhD degree in the Division of the Social Sciences. In order to qualify for the PhD degree, students must satisfy:

1. The University's residency requirements
2. The requirements of the Division of the Social Sciences
3. The requirements of the particular program of the Department of Psychology

The Department of Psychology does not offer courses of study leading to the degree of Master of Arts. However, students admitted to doctoral study may take the Master of Arts 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 Masters of Arts degree, providing the student has met the University's residency requirements, the requirements of the Division of the Social Sciences, and the program requirements of the particular program of the Department of Psychology.

PSYCHOLOGY-LINGUISTICS JOINT PHD PROGRAM

A joint PhD degree program in psychology and linguistics exists for those students who are interested in completing degree requirements in both fields. Psychology students in the Language area of the Cognition Program may apply to the joint degree program in the second year and beyond, but are not required to do so.

PSYCHOLOGY-BUSINESS JOINT PHD PROGRAM

A joint PhD degree program in psychology and business exists for those students who are interested in completing degree requirements in both fields. This program is overseen jointly by the Department of Psychology and by the Managerial and Organizational Behavior Area in the Booth School of Business. Admission to this program requires admission to both the PhD program in psychology and at Booth School of Business. Faculty in both programs will determine, based in a student's primary research interests and/or explicit preferences for a primary research advisor, which program will be the student’s primary affiliation.
ADMISSION

Students are admitted by application to the Department of Psychology to pursue courses of study in doctoral programs that are formulated by the individual programs. Applicants must specify the program to which they are applying. Applicants will be considered for admission only if they have earned a bachelor’s degree or its equivalent. Admission depends upon the strength of the general undergraduate record, scores on the Graduate Record Examination, letters of recommendation, personal statement and interests, and relevant laboratory or field research experience. Please refer to the Office of International Affairs web site: https://internationalaffairs.uchicago.edu/students/prospective/toefl.shtml. Foreign language students must provide evidence of English proficiency by submitting scores from either the Test of English as a Foreign Language (TOEFL) or the International English Testing System (IELTS). Candidates for admission are expected to have some background in psychology as well as mathematics and statistics. Candidates with backgrounds in anthropology, history or sociology are encouraged to apply to Psychology, (the Social Psychology Program); those with strong biological training and interests are encouraged to apply to Psychology, (the Integrative Neuroscience Program or the Social Program).

Students are admitted through the Division of the Social Sciences. Students already enrolled in the Department of Linguistics of the Division of the Humanities who wish to work toward the joint Ph.D. in Psychology, (the Language area of the Cognition Program) and in Linguistics must be admitted as well to the Department of Psychology through the Division of the Social Sciences.

HOW TO APPLY

The application process for admission and financial aid for all Social Sciences graduate programs is administered through the divisional Office of the Dean of Students. The Application for Admission and Financial Aid, with instructions, deadlines and department specific information is available online at: http://apply-ssd.uchicago.edu/apply/. Most of the required supplemental material can be uploaded into the application.

Questions pertaining to admissions and aid should be directed to ssd-admissions@uchicago.edu or (773) 702-8415.

For additional information about the Psychology program, please see: http://psychology.uchicago.edu/ or call 773-702-8861.

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.

COMMON GRADUATE CURRICULUM

The common curriculum consists of a maximum of 8 courses. Other requirements for graduate students will be set by the areas 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, passed with a grade of B or better:

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Credit</th>
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<tbody>
<tr>
<td>STAT 22000</td>
<td>Statistical Methods and Applications (or BUSF 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 I</td>
<td>100</td>
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<tr>
<td>PSYC 37900</td>
<td>Experimental Design II</td>
<td>100</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
1. Each student will complete a trial research project under the guidance of a faculty advisor or advisors by the end of the 7th week of the spring quarter of the second year.
2. 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.
3. The student must submit a proposal for the trial research project to his or her committee for approval by the second week of autumn quarter of the second year. Essential to this approval is the committee’s decision that the project can feasibly be completed by the end of the second year.
4. On Friday of the seventh week of the spring quarter of the student’s second year a written report of the trial research project is due.
5. The student will submit the trial research paper prior to the end of the spring quarter of the second year and defend the trial research paper at a hearing with his or her committee prior to the end of the Spring Quarter of the second year. At the hearing, the committee will also assess the student’s breadth and depth of knowledge of his or her research problem.
6. The student’s committee will have evaluated the report, and will have submitted a written evaluation to the Student Affairs Committee by the end of the spring quarter.
7. Successful completion of the trial research project is a prerequisite for PhD candidacy.

DISSERTATION
1. 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.
2. 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.
3. 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.
4. 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.

COGNITION PROGRAM
Research on cognition lies at the core of the study of many basic psychological mechanisms (e.g., recognition, attention, categorization, memory, inference) and in recent years, neuroimaging methods have been used to make enormous strides grounding these mechanisms in the brain. Work on cognitive mechanisms has been important in a number of other areas of psychology (e.g., Social Psychology and Developmental Psychology) and provides an important theoretical foundation for understanding higher order cognition including language use, reasoning, and problem solving.

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 32414: Cognitive Neuroscience
PSYC 35700: Psychology of Spoken Language
PSYC 37400 Human Memory
PSYC 38655: Environmental Neuroscience
PSYC 40107 Behavioral Neuroscience
PSYC 41000: Advanced Topics in Color Vision
PSYC 41400: Evolutionary Cognitive Psychology
PSYC 38300 Attention
PSYC 43200 Seminar in Language Development
PSYC 43600 Processes of Judgement and Decision Making
PSYC 43650: The Development of Social Cognition

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 DEVELOPMENTAL PSYCHOLOGY PROGRAM

There is a strong history of work in developmental psychology at the University of Chicago. The goal of this program is to foster the continuing development of this area by providing a program of study for graduate students and a community of researchers who share an interest in how development occurs. The Developmental Psychology program offers graduate study which investigates child psychology from a variety of perspectives. Four major research areas make up the program: cognitive development, social and emotional development, language and communicative development, and biological development. Specific topics of research specialization include: vocabulary acquisition, the development of gesture and other forms of nonverbal communication, the development of discourse abilities, mathematical and number knowledge in infants and children, the effects of early brain damage on development, social cognitive development in infancy and early childhood, early emotional understanding, the development of autobiographical memory, parent child interaction, language socialization, cultural influences on development, and environmental effects on language development and school achievement. The emphasis is on the use of experimental and observational methods for the study of development.

Curriculum

In their third and fourth year students write a theoretical review relevant to their dissertation. Ideally, this review could be a publishable article, suitable for a journal such as a Psychological Bulletin or Developmental Review and will help in formulating the dissertation.

1. General course: PSYC 40500 Advanced Seminar in Developmental Psychology is required of all students in the program. A prerequisite for this course is that the student has already taken a survey course in developmental psychology.

2. An advanced course in three of four areas of Developmental Psychology. Certain seminars may also fulfill these requirements. Below are a few examples of courses that will fulfill these requirements. This is not a comprehensive list as course offerings change from year to year. Students may petition the developmental area chair to count courses not included on this list. Topics in Developmental Psychology along with an additional paper may, under special circumstances, be used towards one course satisfying this requirement, with permission of the developmental area chair.
   a. Cognitive/Intellectual Development:
      PSYC 42550 Topics in Cognitive Development; PSYC 33600 Development in Infancy; PSYC 42040 Seminar: Mathematical Development
   b. Biological Development:
      PSYC 31700 Developmental Biopsychology; Psyc 34900: Biopsychology of Attachment (D. Maestripieri); PSYC 36660 ; PSYC 44450 Developmental Social Neuroscience.

Students are expected to take advanced courses and seminars, particularly in their area of interest, and to attend the weekly meeting of Topics in Developmental Psychology.

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:

1. Psychology Department Breadth Courses (2* courses)
   *IN students will take two advanced courses within the Department of Psychology
2. Two of Four Core Neuroscience Courses (Cellular, Behavioral, Systems, Molecular) 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 33960 Biological Rhythms and Behavior
- PSYC 38300 Attention
- Advanced Cognitive Neuroscience (PSYC 38760)
- Neural Oscillations (PSYC 37150)
- Neuropsychopharmacology (PSYC 36901)
- PSYC 32000 Color Vision
- PSYC 37400 Human Memory or LM&C
- PSYC 33700 Perception and Action
- PSYC 33750 Seminar: Skill Acquisition and Sensorimotor Learning
- PSYC 33300 The Social Brain and Empathy
- Attitudes & Persuasion (Psy 46100)
- PSYC 35950 Stereotyping and Prejudice
- PSYC 34700 Social Cognition
- PSYC 35000 Physiology Of Vision
- PSYC 39000 Vision

Trial Research Project

Each student completes a Trial Research Project under the guidance of a faculty advisor. This is a significant piece of research carried out over a 12-month period. Both written and oral presentations of the research are required. The student will submit the trial research paper prior to the end of the Spring Quarter of the second year and defend the trial research paper at a hearing with his or her committee prior to the end of Spring Quarter of the second year. The oral examination will also probe the students’ breadth and depth of knowledge associated with the completed coursework.
Doctoral Dissertation

The Doctoral Dissertation is an independent research project carried out under the guidance of a faculty Dissertation Committee with at least four members. At least two members of the committee, including the chair, must be in the Integrative Neuroscience program; a third member must be in the Department of Psychology. The chair of the committee typically is the primary research advisor. A written dissertation proposal is presented to the committee in advance of an oral Proposal Hearing.

A student is admitted to PhD Candidacy after successfully completing (i) all course requirements, (ii) written and oral presentations of the Trial Research Project, and (iii) an approved dissertation proposal (including oral defense).

The doctoral dissertation is submitted to the dissertation committee prior to a final oral defense (the “final oral examination”). The dissertation committee plus an outside reader, who may be a faculty member at the University of Chicago or a scientist at another institution, administer the final oral exam. The committee members and reader evaluate the dissertation in private after the oral exam. At most one abstention or vote to disapprove is allowed among the committee members and reader; all others must approve the dissertation to satisfy the requirements for the PhD degree.

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.
Instructor(s): Ming Xiang Terms Offered: Autumn
Equivalent Course(s): LING 30401

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.
Instructor(s): B. Prendergast Terms Offered: Spring
Prerequisite(s): Students should have taken or currently be taking PSYC 21750.
**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.

**Instructor(s):** R. Shweder

**Prerequisite(s):** Undergraduates must be in third or fourth year.

**Note(s):** CHDV Distribution: B, C

**Equivalent Course(s):** GNSE 21001, ANTH 35110, GNSE 31000, EDSO 21100, CHDV 31000, ANTH 24320, AMER 33000, PSYC 23000, CHDV 21000

**PSYC 33165. Multidisciplinary Perspectives on Morality. 100 Units.**

The past decade saw an explosion of empirical research in the study of morality. Among 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 neuromolecules 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. Discoveries in neuroscience will soon impact our legal system in ways that hopefully lead to a more cost-effective, humane and flexible system than we have today. The intent of this course is to provide an overview of the current research on the morality, and examine this topic from a range of relevant interdisciplinary perspectives.

**Instructor(s):** J. Decety

**Terms Offered:** Winter

**Equivalent Course(s):** PSYC 23165

**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? It’s 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).

**Instructor(s):** H. Nusbaum, A. Henly

**Terms Offered:** Spring

**Prerequisite(s):** PQ: Third- or fourth-year standing

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

**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.

**Instructor(s):** W. Wei, J. Maunsell, M. Sherman, S. Shevell

**Terms Offered:** Autumn

**Prerequisite(s):** NSCI 20111 or BIOS 24110 or consent of instructor

**Equivalent Course(s):** NSCI 22400, BIOS 24133, CPNS 34133, NURB 34133, PSYC 24133
PSYC 34410. Computational Approaches to Cognitive Neuroscience. 100 Units.
This course is concerned with the relationship of the nervous system to higher order behaviors (e.g., perception, object recognition, action, attention, learning, memory, and decision making). Psychophysical, functional imaging, and electrophysiological methods are introduced. Mathematical and statistical methods (e.g. neural networks and algorithms for studying neural encoding in individual neurons and decoding in populations of neurons) are discussed. Weekly lab sections allow students to program cognitive neuroscientific experiments and simulations.
Instructor(s): N. Hatsopoulos Terms Offered: Winter
Prerequisite(s): For Neuroscience Majors: NSCI 20110, NSCI 20130, BIOS 26210, and knowledge using Matlab, or consent of instructor.
Equivalent Course(s): BIOS 24232, ORGB 34650, NSCI 23600, CPNS 33200

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.
Instructor(s): J. Mateo Terms Offered: Winter
Equivalent Course(s): CHDV 35201

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 computations methods to implement the models in MATLAB.
Instructor(s): D. Kondrashov Terms Offered: Autumn. L.
Prerequisite(s): BIOS 20151 or BIOS 20152 or equivalent quantitative experience by consent of instructor, and three quarters of a Biological Sciences Fundamentals sequence or consent of the instructor.
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.
Instructor(s): D. Kondrashov Terms Offered: Winter. L.
Prerequisite(s): BIOS 26210 or equivalent.
Equivalent Course(s): BIOS 26211, CPNS 31100

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, Ashby, 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.
Instructor(s): L. Kay Terms Offered: Winter
Prerequisite(s): Open to students in all programs. Undergrads must be in at least the 3rd year of their studies.

PSYC 37700. Language, Culture, and Thought. 100 Units.
Survey of research on the interrelation of language, culture, and thought from the evolutionary, developmental, historical, and culture-comparative perspectives with special emphasis on the mediating methodological implications for the social sciences.
Instructor(s): J. Lucy Terms Offered: Spring
Note(s): CHDV Distribution, B, C
Equivalent Course(s): LING 37700
PSYC 37900. Experimental Design II. 100 Units.
Experimental Design II covers more complex ANOVA models than in the previous course, including split-plot (repeated-measures) designs and unbalanced designs. It also covers analysis of qualitative data, including logistic regression, multinomial logit models, and log linear models. An introduction to certain advanced techniques useful in the analysis of longitudinal data, such as hierarchical linear models (HLM), also is provided. For course description contact Psychology.
Instructor(s): M. Berman Terms Offered: Autumn

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.
Instructor(s): M. Casillas Terms Offered: Spring
Note(s): UG: B, C, M; Grad: 5
Equivalent Course(s): LING 38951, CHDV 38950, EDSO 38950

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.
Instructor(s): D. Margoliash Terms Offered: Spring
Note(s): The course is not available to undergraduates without prior approval of the instructor.
Equivalent Course(s): NURB 30107, CPNS 30107

PSYC 40301. Topics in Psychology. 000 Units.
Current research in psychology.
Instructor(s): D. Gallo Terms Offered: Autumn Spring Winter
Note(s): Registration by consent only.

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.
Instructor(s): M. Rosenberg Terms Offered: Autumn

PSYC 40451. Topics in Cognition II. 100 Units.
Discussion of current research in psychology.
Instructor(s): M. Rosenberg Terms Offered: Winter

PSYC 40452. Topics in Cognition III. 100 Units.
Discussion of current research in psychology.
Instructor(s): M. Rosenberg Terms Offered: Spring
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.
Instructor(s): Jonathan Clindaniel Terms Offered: Autumn
Prerequisite(s): No previous coding experience required. A Python boot camp will be held at the beginning of the quarter to teach the coding skills necessary to succeed in the course. Open to Advanced Undergraduates with Instructor Permission.
Equivalent Course(s): CHDV 40404, MACS 40400, MAPS 40401

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.
Instructor(s): Kalil, A Terms Offered: Winter
Equivalent Course(s): CHDV 40770, PPHA 40700

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.
Instructor(s): A. Shaw Terms Offered: Autumn

PSYC 40852. Topics in Developmental Psychology II. 100 Units.
Brown-bag discussion of current research in psychology.
Instructor(s): K. Kinzler Terms Offered: Winter
Note(s): CHDV Distribution: 2*

PSYC 40853. Topics in Dev. Psy. 100 Units.
Brown-bag discussion of current research in psychology.
Instructor(s): TBD Terms Offered: Spring
Equivalent Course(s): CHDV 40853

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.
Instructor(s): A. Shaw Terms Offered: Spring

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.
Instructor(s): G. Norman Terms Offered: Winter
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.
Instructor(s): H. Nusbaum Terms Offered: Spring

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.
Instructor(s): J. Lucy Terms Offered: Autumn
Prerequisite(s): CHDV 21901/31901, PSYC 21950/31900, ANTH 27605/37605, LING 27605/37605 or Permission of Instructor
Note(s): CHDV Distribution: C; 5*
Equivalent Course(s): ANTH 47605, CHDV 41900

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.
Instructor(s): S. London Terms Offered: Spring

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.
Instructor(s): W. Bainbridge, M. Rosenberg Terms Offered: Autumn
Prerequisite(s): The course will be geared towards PhD students, but open to MAPSS students who receive instructor permission to enroll.

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.
Instructor(s): W. Bainbridge Terms Offered: Autumn

PSYC 42650. Working Memory. 100 Units.
This course will cover basic working memory theory, broadly defined, with a focus on neural models.
Instructor(s): E. Awh Terms Offered: Spring
Note(s): Please contact instructor for permission to register.

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.
Instructor(s): A. Bakkour Terms Offered: Autumn
Note(s): Consent only.

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 is to provide students with a high-level understanding of the complexities associated with contemporary stress research from the perspective of social neuroscience and psychophysiology.
Instructor(s): G. Norman Terms Offered: Autumn
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.
Instructor(s): E. Vogel Terms Offered: Spring

PSYC 43830. Advanced Topics in Working Memory. 100 Units.
Seminar on contemporary topics in working memory research.
Instructor(s): E. Vogel Terms Offered: Autumn
Note(s): By instructor approval.

PSYC 44000. Moral Psychology & Comparative Ethics. 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 those questions.
Instructor(s): R. Shweder Terms Offered: Autumn
Prerequisite(s): Advanced undergraduates may enroll with permission of instructor
Note(s): CHDV Distribution: B, C; 3
Equivalent Course(s): CHDV 45601

PSYC 45300. When Cultures Collide: Multiculturalism 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.
Instructor(s): R. Shweder Terms Offered: Autumn
Equivalent Course(s): GNSE 45600, ANTH 45600, CHDV 45699, HMRT 35600, KNOW 45699

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.
Instructor(s): J. Yu Terms Offered: Winter
Prerequisite(s): Familiarity with coding in python.

PSYC 46662. 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.
Instructor(s): S. London Terms Offered: Winter
Prerequisite(s): PQ: Some familiarity with molecular biology and/or genomes is recommended.

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.
Among topics discussed in the first half of the sequence are the formal structure of semiotic systems, the ethnographically crucial incorporation of linguistic forms into cultural systems, and the methods for empirical investigation of "functional" semiotic structure and history.
Instructor(s): Constantine Nakassis Terms Offered: Autumn
Prerequisite(s): Consent of instructor for Undergrads
Note(s): CHDV Distribution: 5*
Equivalent Course(s): CHDV 37201, ANTH 37201, LING 31100

PSYC 47002. Language in Culture II. 100 Units.
The second half of the sequence takes up basic concepts in sociolinguistics and their critique.
Instructor(s): Susan Gal Terms Offered: Winter. Winter 2021
Prerequisite(s): Language in Culture-1
Note(s): CHDV Distribution: 5*
Equivalent Course(s): CHDV 37202, ANTH 37202, LING 31200

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.
Instructor(s): Bautista, R Terms Offered: Spring
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.
Instructor(s): H. Nusbaum Terms Offered: Autumn

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.
Instructor(s): E. Awh Terms Offered: Autumn
Equivalent Course(s): CHDV 48001

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.
Instructor(s): E. Awh Terms Offered: Winter
Equivalent Course(s): CHDV 48002

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.
Instructor(s): E. Awh Terms Offered: Spring
Equivalent Course(s): CHDV 48003

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.
Instructor(s): D. Maestripieri Terms Offered: Autumn
Note(s): CHDV Distribution: 1*, 2*
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