

PSYCHOLOGY

Courses offered by the Department of Psychology are listed under the subject code PSYCH on the Stanford Bulletin's ExploreCourses web site.

The department, housed in Jordan Hall, maintains many computer-equipped laboratories and the Stanford Center for Cognitive and Neurobiological Imaging (CNI). Bing Nursery School, located on campus at 850 Escondido Road, provides a laboratory for child observation, training in nursery school teaching, and research. It was constructed with funding from the National Science Foundation and a special grant from Mrs. Anna Bing Arnold and Dr. Peter Bing.

The department provides

- courses designed for the general student
- a major program leading to the degree of Bachelor of Arts, including options for honors and a specialization in one of four content area tracks
- an undergraduate minor program
- a coterminal master's degree program leading to the degree of Master of Arts
- programs of graduate study and research leading to the degree of Doctor of Philosophy
- a Ph.D. minor

Applications are not accepted for the master's degree except as noted below.

Mission of the Undergraduate Program in Psychology

The mission of the undergraduate program in Psychology is to introduce students to the theories and empirical studies of human behavior. This includes the study of aging, achievement, child development, cognitive processes, conflict, culture, decision making, emotion, group behavior, health, identity, infancy, language, learning and memory, morality, motivation, personality, psychopathology, race, self, social perception, visual perception, and other related topics. The major provides students with knowledge and skills relevant to professional careers in technology, business, counseling, education, public policy, law, and medicine, as well as graduate studies in Psychology.

Learning Outcomes (Undergraduate)

The department expects undergraduate majors in the program to be able to demonstrate the following learning outcomes. These learning outcomes are used in evaluating students and the department's undergraduate program. Students are expected to demonstrate:

1. an understanding of core knowledge within the discipline of psychology including relevant theory and research.
2. the ability to analyze a problem correctly using discipline specific methodology.
3. the ability to draw sound inferences and conclusions from data.
4. the ability to write and communicate ideas clearly.

Learning Outcomes (Graduate)

The purpose of the master's program is to further develop knowledge and skills in Psychology and to prepare students for a professional career or doctoral studies. This is achieved through completion of courses, in the primary field as well as related areas, and experience with independent work and specialization.

The Ph.D. is conferred upon candidates who have demonstrated substantial scholarship and the ability to conduct independent research

and analysis in Psychology. Through completion of advanced course work and rigorous skills training, the doctoral program prepares students to make original contributions to the knowledge of Psychology and to disseminate this knowledge.

Bachelor of Arts in Psychology

Major Requirements

Students declaring a major in Psychology must complete a minimum of 70 units of course work in Psychology, 60 of which must be taken in the Psychology department. The remaining 10 units can be taken outside of the Psychology department but must be pre-approved by the student services office or faculty adviser. These courses should represent a coherent thematic focus. One way to achieve this focus is through a field of study. Courses taken to satisfy the 70-unit requirement must be taken for a grade of C- or better (except for courses offered only on a satisfactory/no credit basis). Majors must take PSYCH 1 Introduction to Psychology, and PSYCH 10 Introduction to Statistical Methods: Precalculus. Advanced placement (AP) credit may no longer be used toward the Psychology major requirements. Beyond these two required courses, students must complete at least five of the following eleven core Psychology courses, with a minimum of two from each area A and B:

		Units
Area A		
PSYCH 30	Introduction to Perception	3
PSYCH 35	Minds and Machines	4
PSYCH 45	Introduction to Learning and Memory	3
PSYCH 50	Introduction to Cognitive Neuroscience	4
Area B		
PSYCH 60	Introduction to Developmental Psychology	3
PSYCH 70	Self and Society: Introduction to Social Psychology	3-4
PSYCH 75	Introduction to Cultural Psychology	5
PSYCH 80	Introduction to Personality and Affective Science	3
PSYCH 90	Introduction to Clinical Psychology	3
PSYCH 95	Introduction to Abnormal Psychology	3

Students must take one Writing in the Major (WIM) course in Psychology, and should check the Stanford Bulletin yearly as these courses may change. The department also strongly recommends that all majors take at least one advanced seminar.

Students may count up to 10 units of research, independent study, and practica (including but not limited to PSYCH 194 Reading and Special Work, PSYCH 195 Special Laboratory Projects, PSYCH 281 Practicum in Teaching) toward the Psychology major. Students who are teaching assistants for a Psychology course or are enrolled in the senior honors program are allowed up to 15 units in independent study and research. Any units beyond the limit of 10 or 15 may be counted toward the 180 units required for graduation.

Students who are double majoring or completing a minor degree in another department may not overlap (double-count) courses, unless the overlapping courses constitute introductory skill requirements, such as PSYCH 10 Introduction to Statistical Methods: Precalculus. In this instance, while the course requirement would be satisfied, the units for the course can only be applied to one program of study, not both. Consult the student services office for further clarification.

Summer Quarter Psychology courses are not equivalent to courses given during the regular academic year and, while applicable toward the 70 units needed for the major, may not be used to fulfill core course requirements. Therefore, PSYCH 1, PSYCH 10, and the Area A and B courses cannot be taken during Summer Quarter to fulfill the major requirements. Additionally, a course taken during the Summer Quarter

cannot be used to replace the grade of a non-Summer Quarter course, even if the title and units of the two courses are the same.

Beyond the Minimal Requirements

The following recommendations may be helpful to students who wish to plan a program that goes beyond the minimal requirements listed above:

1. Within the general major, the student may take advanced undergraduate or graduate courses (although some require the consent of the instructor), including seminars. The student may also take advantage of widespread opportunities for directed research, working closely with individual faculty and graduate students.
2. The student may apply to the senior honors program, described below.
3. The student may elect to pursue one of four specialization tracks of study: Cognitive Sciences; Health and Development; Mind, Culture, and Society; or Neuroscience, described below.

The training obtained from the pursuit of any of these options is valuable not only for students considering graduate work in Psychology, but also for those thinking of professional careers outside of Psychology in fields such as technology, business, counseling, education, law, public policy or medicine.

Credit from Outside the Department

Psychology majors must complete at least 60 units of course work toward their major at Stanford within the Psychology department. Psychology majors may count no more than a total of 10 units credit from outside the department toward the major. Both majors and minors, under extenuating circumstances, may use one course from outside the department to fulfill core course requirements. Additional courses may be used to fulfill the 70-unit major requirement, but may not be counted as core courses. Please see the student services office for further clarification.

Petition for transfer of credit is rarely granted. In cases where petitioning is necessary, there are two types of credit from outside the department: external transfer credit for courses taken at institutions other than Stanford and credit for courses in other Stanford departments. A student must have already declared Psychology as a major or minor in order to submit a petition for transfer credit. Stanford credit for courses completed at other institutions must have been granted by the External Credit Evaluation section of the Registrar's Office; those units may be applied toward the 180 units required for graduation. To have credit from outside the department evaluated to fulfill requirements toward the Psychology major or minor, students must complete an Undergraduate Petition form, available from the student services office, and submit it with a course syllabus. Students requesting external transfer credit must also submit a copy of the signed transcript from the External Credit Evaluation section of the Registrar's Office showing the number of Stanford units granted for the course. The Psychology department then evaluates external credit courses and courses from other Stanford departments to determine if they can be applied toward Psychology major or minor requirements.

Specialization Tracks

Students in the major program, including those in the senior honors program, may elect to specialize in one of four specialization tracks:

- Cognitive Sciences
- Health and Development
- Mind, Culture, and Society
- Neuroscience

These tracks consist of a coherent set of courses leading to advanced undergraduate or even graduate-level courses in an area. In the ideal case, the student who specializes would acquire an understanding

of a range of psychological processes, as well as an appreciation of the significance of these processes in the chosen area of application. Specialization in one of the tracks can facilitate preparation for a professional career as well as for graduate work in Psychology.

Participation in a specialization track is optional, although students who do not wish to complete all the requirements for a track may still want to use the track as a guideline for an integrated program in Psychology. Students who choose to complete a specialization track must meet the requirements for the major plus the additional requirements designated for the track. Typically, the courses required for a track include one or two required courses, four to six recommended courses in Psychology, one or two advanced seminars, and three or four courses in related disciplines. Psychology courses completed for the track count toward satisfying the major requirements. Courses from other departments listed for the track may count toward the 10 outside units for the major requirement, but must be pre-approved by the student services office or faculty adviser.

These specialization tracks are declared on Axxess upon approval of faculty adviser. They appear on the transcript but not on the diploma.

Honors Program

The senior honors program is designed for exceptionally able Psychology majors who wish to pursue a year of intensive supervised independent research. Admission to the program is made at the end of the student's junior year on the basis of:

- excellent academic performance
- previous research experience
- two letters of recommendation by faculty and/or graduate students

Applications are available in April and are to be submitted to the department's student services office with a current transcript and recommendations prior to the student's senior year.

Students interested in the program should involve themselves in research as early as possible and should acquire a broad general background in Psychology, including statistics, and a deep background in their chosen area. Typically, students work in their honor thesis adviser's lab for at least one quarter. The honors program is particularly appropriate for students planning to go to graduate school in Psychology or in other social sciences, as well as in computer science, business, counseling education, law, public policy and medicine.

During Autumn Quarter of their senior year, honors program students participate in a weekly seminar and meet with their advisers to develop their experimental program and begin data collection. Winter and Spring Quarters are devoted to completing the research, analyzing the data, and writing the thesis, which is submitted mid-May. Students give oral presentations of their projects at the annual Honors Convention. This convention is attended by undergraduates, graduate students, and faculty.

Minor in Psychology

Declaration

Students who wish to declare a minor field of concentration in Psychology must do so no later than the deadline for their application to graduate.

Degree Requirements

Completion of a minimum of 35 units in Psychology is required for the minor, including PSYCH 1 Introduction to Psychology and PSYCH 10 Introduction to Statistical Methods: Precalculus, or a comparable statistics course. Advanced placement (AP) credit may no longer be used towards the Psychology minor.

The minor must include three of eleven core courses with a minimum of one from each of two areas and elective Psychology courses of at least three units each, totaling 35 units:

Area A

Select a minimum of one of the following:

PSYCH 30	Introduction to Perception
PSYCH 35	Minds and Machines
PSYCH 45	Introduction to Learning and Memory
PSYCH 50	Introduction to Cognitive Neuroscience

Area B

Select a minimum of one of the following:

PSYCH 60	Introduction to Developmental Psychology
PSYCH 70	Self and Society: Introduction to Social Psychology
PSYCH 75	Introduction to Cultural Psychology
PSYCH 80	Introduction to Personality and Affective Science
PSYCH 90	Introduction to Clinical Psychology
PSYCH 95	Introduction to Abnormal Psychology

Elective Psychology Courses

Students who declared a Psychology minor prior to the 2002-03 academic year may choose any three of the eleven core courses.

Students who declared a Psychology minor prior to the 2005-06 academic year may choose to complete seven total courses:

	Units	
PSYCH 1	Introduction to Psychology	5
PSYCH 10	Introduction to Statistical Methods: Precalculus	5
Three core courses		
Two elective courses		

Independent study, research, and practica cannot be counted toward the minor. Summer Quarter Psychology courses are not applicable toward the 35 units needed for the minor.

All courses used to fulfill the requirements of the minor must be passed with a grade of C- or better, except for courses offered only on a satisfactory/no credit basis. No more than 10 units of transfer credit may be counted toward the Psychology minor.

Master of Arts in Psychology

The Department of Psychology offers a master of arts degree only to students concurrently enrolled in other Stanford programs.

A master of arts degree is available to students enrolled in the Department's Ph.D. program. For such students, the requirements of the M.A. degree are listed in the "Doctoral" tab of this section.

In exceptional cases, students concurrently enrolled in another doctoral or professional program at Stanford may also apply for the M.A. degree. In such cases, the applicable admissions and degree requirements are determined on a case by case basis. Such applicants should consult with the student services office in the Department of Psychology.

All applicants must satisfy University residency requirements for the degree and are responsible for consulting with their primary departments or the Financial Aid Office about the effects of the proposed program on their current funding. General University requirements for the master's degree are described in the "Graduate Degrees (<http://exploreddegrees.stanford.edu/graduatedegrees>)" section of this bulletin.

Coterminal Master's Program

The Psychology department has decided to terminate the coterminal program, with 2015-16 as the final year the department accepted applications and admitted coterminal students to the MA in Psychology.

Students in the Coterminal program may be terminated if they no longer have an adviser, or if they are not making satisfactory progress in course work or research.

University Coterminal Requirements

Coterminal master's degree candidates are expected to complete all master's degree requirements as described in this bulletin. University requirements for the coterminal master's degree are described in the "Coterminal Master's Program (<http://exploreddegrees.stanford.edu/cotermdegrees>)" section. University requirements for the master's degree are described in the "Graduate Degrees (<http://exploreddegrees.stanford.edu/graduatedegrees/#masterstext>)" section of this bulletin.

After accepting admission to this coterminal master's degree program, students may request transfer of courses from the undergraduate to the graduate career to satisfy requirements for the master's degree. Transfer of courses to the graduate career requires review and approval of both the undergraduate and graduate programs on a case by case basis.

In this master's program, courses taken three quarters prior to the first graduate quarter, or later, are eligible for consideration for transfer to the graduate career. No courses taken prior to the first quarter of the sophomore year may be used to meet master's degree requirements.

Course transfers are not possible after the bachelor's degree has been conferred.

The University requires that the graduate adviser be assigned in the student's first graduate quarter even though the undergraduate career may still be open. The University also requires that the Master's Degree Program Proposal be completed by the student and approved by the department by the end of the student's first graduate quarter.

Degree Requirements for a Coterminal Master's Degree

Course work: For the coterminal master's degree, students must complete at least 45 units of Psychology courses, none of which may duplicate courses taken for the undergraduate degree, and none of which may be courses taken in the Summer Quarter. Courses to be counted toward the master's degree must be passed with a grade of B- or better, unless the course is offered only on a satisfactory/no credit basis.

Of these 45 required units, at least 27 must be in Psychology courses numbered 200 or above. Units from research, teaching, practica, independent study, and lab courses may not be counted toward these 27 units, but may be counted as part of the remaining 18 required units. Examples of such course that may not be counted toward these 27 units include:

	Units	
PSYCH 246	Cognitive and Neuroscience Friday Seminar	1
PSYCH 258	Graduate Seminar in Social Psychology Research	1-3
PSYCH 269	Graduate Seminar in Affective Science	1
PSYCH 275	Graduate Research	1-15
PSYCH 281	Practicum in Teaching	1-5
PSYCH 282	Practicum in Teaching PSYCH 1	1-2
PSYCH 297	Seminar for Coterminal Master of Arts	1-2

Included in the 27 units of graduate-level courses must be at least one 3-unit course from each of Area A (cognitive science and neuroscience) and Area B (affective, developmental, and social psychology), and at least one upper division statistics course that has been approved by the

student's adviser. The specific courses in Area A and Area B available to coterminal master students vary from year to year, and prospective students should consult with the department's Student Services Office for up-to-date information on courses available and their assignment to Area A and Area B.

Research: Demonstration of competence in the design and execution of psychological research is also required for receipt of the master's degree. This demonstration entails completion of a master's thesis containing original research. If the student is currently writing a senior honors thesis, this honors thesis may be accepted as proof of research competence, provided the honors thesis is judged to be master's level research by the student's adviser and the department's graduate program committee. If the student has completed an honors thesis in Psychology in the prior year, the student would be expected to continue independent research during the coterminal year and to submit this research in a written report that, together with the completed honors thesis, would constitute the master's thesis. All students are required to make an oral presentation of their research during the Spring Quarter, and to present their thesis or written report at the end of that Quarter.

Doctor of Philosophy in Psychology

There are no specific course requirements for admission to the doctoral program. However, an applicant should have research experience as an undergraduate, as well as the equivalent of an undergraduate major in Psychology. The major focus of the doctoral program is on research training, and admission is highly selective.

Applicants for admission must submit their scores on the general Graduate Record Examination as part of the application. GRE subject scores are recommended.

General University requirements for the Ph.D. are described in the "Graduate Degrees (<http://www.stanford.edu/dept/registrar/bulletin/4901.htm>)" section of this bulletin.

In addition to fulfilling Stanford University requirements for the degree, the following departmental requirements are stipulated.

First-Year Course Requirements

During the first year of graduate study, the student should take PSYCH 207 Professional Seminar for First-Year Ph.D. Graduate Students, at least one approved graduate statistics course, and at least two core courses from the following list:

		Units
PSYCH 202	Cognitive Neuroscience	3
PSYCH 205	Foundations of Cognition	1-3
PSYCH 211	Developmental Psychology	1-3
PSYCH 212	Classic and contemporary social psychology research	1-3
or PSYCH 215	Mind, Culture, and Society	
PSYCH 213	Affective Science	3

Students in each area may be required to take up to two additional non-core graduate courses in their area of specialization.

The student is expected to spend at least half of the time in research from the beginning of the first year of graduate study to the completion of the Ph.D., taking no more than 10 units of course work each quarter. At the end of the first year of graduate study, the student must file with the department a written report of the first-year research activities.

Second-Year Course Requirements

By the end of the second year of graduate study, the student should complete at least one additional core course for a total of three taken from the list above, and take a second approved graduate course in

statistics as well as other courses contributing toward completion of the advanced course or minor requirement described below.

Optional Application for Conferral of the M. A. Degree: Graduate students, who have completed (a) the first-year and second-year course requirements, and (b) at least 45 units of Psychology courses, may apply for conferral of the M.A. degree. This application should be discussed with the Student Services office in the Department of Psychology.

Third-Year and Beyond

By the end of the third year the student should complete all of the required core courses listed above and should be well on the way toward completion of the advanced course or minor requirement.

Students are expected to form a research committee, which must include the dissertation reading committee, before the initiation of the dissertation research. The research committee includes the dissertation adviser and consists of at least three faculty members, at least two of whom should have primary appointments in the Psychology department. For University guidelines for the composition of the dissertation reading committee, see the "Graduate Degrees (<http://www.stanford.edu/dept/registrar/bulletin/4901.htm>)" section of this bulletin.

The research committee should meet no later than the last day of classes of Spring Quarter of the third year, and determines the timeline for further development of the dissertation research project. Subsequent meetings are triggered by the completion of one of two documents: a dissertation proposal (DP) or a conceptual analysis of the dissertation area (CADA). The timing and sequencing of the DP and CADA are developed by the student in consultation with the committee. As a general guide, one of the two preliminary elements (CADA or DP) should be completed by the end of the third Summer Quarter and the second should be completed by the end of the fourth Spring Quarter. Students are free to alter the membership of the committee at any time during the process, subject to consultation with the adviser.

The DP should be a description of the proposed research. The CADA provides a framework for the research topic of the dissertation, addresses the central issues within the specialty area, and reviews the pertinent literature.

Advanced Course or Minor Requirements

The candidate must complete 12 units of advanced graduate course work or a Ph.D. minor in another department. If a student waives the minor requirement in favor of the 12 advanced units, the student must fulfill the advanced course requirement by taking (a) non-core graduate courses required by a particular area, or (b) graduate-level courses in other departments comparable in quality to Psychology's graduate courses. If there is any question about comparability, the student should consult the adviser, student services, and, in some cases, the graduate program committee chair before taking the course.

Orals

The candidate must pass the University oral examination, which also serves as a dissertation defense. A committee is formed to review the oral examination, including the dissertation reading committee, an additional faculty member, and one oral examination committee chair from outside the Psychology department. The oral examination consists of a 40-45-minute presentation to the department of the completed dissertation research. Parents and friends are welcome to attend. Following the presentation, the student and the committee convene for a discussion of the dissertation and the presentation.

Dissertation Requirements

The candidate must complete a dissertation satisfactory to the dissertation reading committee prior to the oral examination. Minor revisions to formatting may be made after the oral examination.

Ph.D. candidacy expires five years after admission to candidacy at the end of the second year of study. Reapplication requires department reexamination.

Student Evaluations

First-Year Evaluation: It is the department's policy to evaluate the progress of each graduate student at the end of the first year of graduate study. As part of the procedure, each student is required to file with the department a report of the first-year research activities.

Students should discuss this report and the evaluation procedures with their adviser as early as possible in their first year. If the student fulfills the academic promise displayed upon entrance, he or she is invited to continue working towards the doctorate.

The first-year evaluation is primarily based on three factors:

1. quality of research carried out in the first year
2. performance in courses (especially required courses)
3. recommendations of the adviser (including a commitment on the part of that adviser to continue in that role).

Second-Year and Beyond Evaluation: A similar evaluation is conducted at the end of each year of graduate training involving the same criteria as the first year; however, the student is not required to submit a paper. Students who are not making satisfactory progress may be dropped from the program.

The Doctoral Training Program

As indicated by the requirements described above, a student concentrates in any one of several areas within Psychology. Regardless of area, however, the training program places emphasis on the development of research competence, and students are encouraged to develop those skills and attitudes that are appropriate to a career of continuing research productivity.

Two kinds of experience are necessary for this purpose. One is the learning of substantial amounts of technical information. A number of courses and seminars are provided to assist in this learning, and a student is expected to work out a program, with his or her adviser, to attain this knowledge in the most stimulating and economical fashion.

A second aspect of training is one that cannot be gained from the courses or seminars. This is firsthand knowledge of, and practical experience with, the methods of psychological investigation and study. These methods include ways of behaving with the subjects being studied. Students are provided with whatever opportunities they need to reach those levels of competence representative of doctoral standing. Continuing research programs, sponsored by members of the faculty, offer direct opportunities for experience in fields represented by the faculty's many research interests.

Each student achieves competence in unique ways and at different rates. Each student and adviser share in planning a program leading to the objectives discussed. The student is expected to spend half of his or her time on research and takes no more than 10 units of course work per quarter. For further information please contact the student services office and the department graduate guide.

Teaching Requirement

The department views experience in supervised teaching as an integral part of its graduate program. Regardless of the source of financial support, all students serve as teaching assistants for at least five Psychology courses during their graduate study. Of these five teaching occasions, two must involve PSYCH 1, or either two Statistics courses (i.e., PSYCH 10, PSYCH 252, PSYCH 253, and PSYCH 254), or one

Statistics course and one other course the department may designate as a service course.

		Units
PSYCH 1	Introduction to Psychology	5
or PSYCH 10	Introduction to Statistical Methods: Precalculus	
PSYCH 252	Statistical Methods for Behavioral and Social Sciences	1-6
or PSYCH 253	Statistical Theory, Models, and Methodology	
or PSYCH 254	Lab in Experimental Methods	

Students are discouraged from participating in teaching during the first year of graduate study. However, all first and second year students are strongly encouraged to attend a one-day TA Training Workshop offered in September before the autumn quarter. Students typically progress from closely supervised teaching to more independent work. Some students may be invited to offer a supervised, but essentially independent, seminar during their final year of graduate study.

Psychology Colloquium

The Psychology Colloquium meets on most Wednesday afternoons at 3:45 p.m. Speakers from Stanford and other institutions present topics of current interest. Graduate students are expected to attend. Additional announcements may be found at the Colloquium Schedule (<http://www.stanford.edu/dept/psychology/colloquium>) web site.

Ph.D. Minor in Psychology

Candidates for the Ph.D. degree in other departments may elect a minor in Psychology. To obtain a minor, the student must complete 20 units of course work at the graduate level in the Department of Psychology, excluding PSYCH 275 Graduate Research. Crosslisted graduate courses can be used to satisfy this requirement. All courses counting toward the Ph.D. minor must be passed with a grade of 'B-' or better, unless the course is offered only on a credit/no credit basis.

Emeriti: (Professors) Nalini Ambady, Albert Bandura, Gordon H. Bower, Herbert H. Clark, John H. Flavell, Leonard M. Horowitz, Mark R. Lepper, Eleanor Maccoby, Roger N. Shepard, Claude M. Steele, Barbara Tversky, Philip G. Zimbardo

Chair: Ian H. Gotlib

Professors: Laura L. Carstensen, Geoffrey Cohen, Carol Dweck, Jennifer L. Eberhardt, Ian H. Gotlib, Kalanit Grill-Spector, James J. Gross, Brian Knutson, Ellen M. Markman, Hazel R. Markus, James L. McClelland, Dale Miller, Benoit Monin, Russell A. Poldrack, Lee D. Ross, Ewart A. C. Thomas, Anthony D. Wagner, Brian Wandell, Jeffrey J. Wine

Professor (Research): Anthony Norcia

Associate Professors: Anne Fernald, Michael C. Frank, Noah Goodman, Jeanne L. Tsai, Gregory M. Walton

Associate Professor (Teaching): Catherine Heaney

Assistant Professors: Alia Crum, Justin Gardner, Hyowon Gweon, Daniel Yamins, Jamil Zaki

Lecturers: Parul Chandra, Amie Haas, Bridgette Martin Hard, Adrienne Lomangino, Mary Peck Peters, Kevin Weiner, Jennifer Winters, Beth Wise

Courtesy Professors: William C. Dement, Gary H. Glover, Jon Krosnick, Fei-Fei Li, Tanya Luhmann, Robert MacCoun, Bruce McCandliss, William T. Newsome, Robb Willer

Courses

PSYCH 1. Introduction to Psychology. 5 Units.

An introduction to the science of how people think, feel, and behave. We will explore such topics as intelligence, perception, memory, happiness, personality, culture, social influence, development, emotion, and mental illness. Students will learn about classic and cutting edge research, a range of methods, and discover how psychology informs our understanding of what it means to be human, addresses other fields, and offers solutions to important social problems. An alternative version of the course, PSYCH 1L, is also offered for reduced (3) units, but does not count for major/minor requirements for Psychology or other disciplines. For more information on PSYCH 1 and PSYCH 1L, visit <http://psychone.stanford.edu>.

PSYCH 1L. Introduction to Psychology. 3 Units.

A reduced-unit version of Stanford's popular Psych 1 class. An introduction to the science of how people think, feel, and behave. We will explore such topics as intelligence, perception, memory, happiness, personality, culture, social influence, development, emotion, and mental illness. Students will learn about classic and cutting edge research, a range of methods, and discover how psychology informs our understanding of what it means to be human, addresses other fields, and offers solutions to important social problems. The primary version of the course, PSYCH 1, is offered for 5 units and counts for major/minor requirements for Psychology and other disciplines. For more information on PSYCH 1 and PSYCH 1L, visit <http://psychone.stanford.edu>.

PSYCH 4N. Predicting aggregate choice. 3 Units.

Preference to freshmen. Is prediction of group choice possible and how can it be done? This course is ideal for students that would like to extend predictions about individual choice to group choice, and who plan to apply this knowledge to future research.

PSYCH 7N. Learn to Intervene, Wisely. 3 Units.

Do you ever look around and see ways that the world could be a better place, especially if people behaved a little differently? Do you wonder what prevents better outcomes? In this seminar, we will examine social-psychological processes that lie behind diverse social problems, especially how people make sense of themselves, other people, or important situations, sometimes in pejorative ways that undermine outcomes. Then we will examine interventions that address critical processes to promote human flourishing. You'll have the opportunity to read and discuss classic and contemporary wise psychological interventions such as: how a change in the sign on a hospital soap dispenser can increase soap use; how a change in survey items can raise voter turnout; how a change in a single question can improve dating relationships; and how reading-and-writing exercises that address students' beliefs about intelligence and belonging in school can improve achievement years into the future. In learning about this research, you will discover more about psychological processes, how basic research helps clarify these processes, how they contribute in complex field settings to social problems, and how they can be altered. As you learn from past research, you'll have the opportunity to design your very own wise intervention and to workshop others' efforts. You will identify a social problem on campus of interest to you, say: How can you reduce waste in the cafeteria? How can you get more people to take the stairs? How can you get people to hold more inclusive attitudes? Then you will identify a psychological process you think contributes to this problem, implement an intervention in the field and track the results. When you have completed this seminar, you will more fully understand the psychological aspect of social problems and how this can be addressed through rigorous research.

PSYCH 7Q. Language Understanding by Children and Adults. 3 Units.

How do we first learn to find meaning in strings of speech sounds? Understanding spoken language requires the rapid integration of acoustic information with linguistic knowledge and with conceptual knowledge based on experience with how things happen in the world. Topics include research on early development of language understanding and laboratory methods of how young children make sense of speech. Observations of preschool children and visits to Stanford laboratories. Might be repeatable for credit.

PSYCH 8N. The New Longevity. 3 Units.

Adult development from the perspective of life-span theory -- a conceptual framework that views development as a series of adaptations to physical, societal and individual resources and constraints. Students will learn about demographic and medical changes, ways that individuals typically change socially, emotionally and cognitively as they move through adulthood. An understanding of the conceptual foundations of the life-span approach and place aging of young people today in historical context.

PSYCH 9N. Reading the Brain: the Scientific, Ethical, and Legal Implications of Brain Imaging. 3 Units.

It's hard to pick up a newspaper without seeing a story that involves brain imaging, from research on psychological disorders to its use for lie detection or "neuromarketing". The methods are indeed very powerful, but many of the claims seen in the press are results of overly strong interpretations. In this course, you will learn to evaluate claims based on brain imaging research. We will also explore the deeper ethical and philosophical issues that arise from our ability to peer into our own brains in action. The course will start by discussing how to understand and interpret the findings of brain imaging research. We will discuss how new statistical methods provide the ability to accurately predict thoughts and behaviors from brain images. We will explore how this research has the potential to change our concepts of the self, personal responsibility and free will. We will also discuss the ethics of brain imaging, such as how the ability to detect thoughts relates to personal privacy and mental illness. Finally, we will discuss the legal implications of these techniques, such as their use in lie detection or as evidence against legal culpability.

PSYCH 10. Introduction to Statistical Methods: Precalculus. 5 Units.

Techniques for organizing data, computing, and interpreting measures of central tendency, variability, and association. Estimation, confidence intervals, tests of hypotheses, t-tests, correlation, and regression. Possible topics: analysis of variance and chi-square tests, computer statistical packages.

Same as: STATS 60, STATS 160

PSYCH 10N. Kids, Culture, and Poverty: From Biology to Social Action. 4 Units.

Years before they set foot in school, children growing up in poor families begin to diverge from children in richer families in their trajectories of cognitive and language growth. These differences have powerful and enduring consequences for the health, well-being, educational success, and longevity of individuals, as well as for the future prosperity of the societies in which children become adults. Early childhood is a time of both enormous promise and considerable risk, and parents in different cultures have widely differing practices and beliefs about their role in enabling children to avoid risk and achieve their potential. In this seminar we will evaluate evidence from the biological and social sciences showing how positive and negative experiences in infancy have profound and enduring effects on early brain architecture, with cascading consequences for later development in childhood and adulthood. We will also consider the challenges of designing more effective programs and social policies to provide support for families in diverse cultural contexts, with the goal of helping more children to reach their full potential.

PSYCH 11N. Origin of Mental Life. 3 Units.

Preference to freshmen. Mental life in infancy; how thinking originates. How do babies construe the objects, events, people, and language that surround them? Recent advances in psychological theory, hypotheses, and evidence about how the infant human mind develops.

PSYCH 12N. Self Theories. 3 Units.

Preference to freshmen. The impact of people's belief in a growing versus fixed self on their motivation and performance in school, business, sports, and relationships. How such theories develop and can be changed.

PSYCH 13N. Emotion Regulation. 3 Units.

This seminar provides a selective overview of the scientific study of emotion regulation. Topics include: theoretical foundations, cognitive consequences, developmental approaches, personality processes and individual differences, and clinical and treatment implications. Our focus is on interesting, experimentally tractable ideas. Meetings will be discussion based.

PSYCH 13S. Dynamical models of mental processes: Development, analysis, and simulation. 2 Units.

Mathematical modeling has been a critical component in modern psychological and cognitive neuroscience research on the dynamics of mental processes. This course is designed to equip the new generation of such scientists with tailored mathematical knowledge to develop models of their own. I will use classical models and my own experience in modeling decision making as examples to demonstrate the process from vague ideas to the development, refinement, analysis and simulation of dynamical models. Along the way, systematic knowledge in differential equations, numerical methods, principle component analysis etc will be provided to facilitate the general ground for future models of students' choosing. Open to graduate students and advanced undergraduates.

PSYCH 15N. Interpersonal Influence. 3 Units.

This course will examine how individuals influence each other, both intentionally as well as nonconsciously. The focus will be on individuals in dyads rather than in groups. We will examine a) subtle interpersonal influence processes such as nonverbal communication, b) structural sources of interpersonal influence such as gender, race, social class, and culture, and c) interpersonal influence within different relationships such as organizational and romantic relationships. Familiarity with technology and video editing is useful. Students will have the opportunity to make brief podcasts and iMovie videos, as weekly responses to readings, as well as for the final class project.

PSYCH 16N. Amines and Affect. 3 Units.

Preference to freshmen. How serotonin, dopamine, and norepinephrine influence people's emotional lives. This course is ideal for students that would like to get deeper exposure to cutting edge concepts and methods at the intersection of psychology and biology, and who plan to apply their knowledge to future research.

PSYCH 17N. Language and Society: How Languages Shape Lives. 3 Units.

Do people who speak different languages think differently? What role does language play in politics, law, and religion? The role of language in individual cognition and in society. Breaking news about language and society; the scientific basis for thinking about these broad issues.

PSYCH 20N. How Beliefs Create Reality. 3 Units.

This seminar will take an interdisciplinary approach to exploring how subjective aspects of the mind (e.g., thoughts, beliefs, and expectations) can fundamentally change objective reality. Over the course of the semester, students will be challenged to think critically about research from psychology, sociology, and medicine, which suggests that what we think, believe and expect plays a significant role in determining our physical health, performance and well-being. Students will explore research on how mindsets about nutrition, exercise, and stress can alter the body's response to those phenomena. Students will also uncover how social interactions with friends, family, colleagues and the media influence the perceived quality and impact of cultural products such as art, music, and fashion. And students will learn about the neurological and physiological underpinnings of the placebo effect, a powerful demonstration of expectation that produces real, healing changes in the body. Finally, students will have the opportunity to consider real world applications in disciplines including policy, business, medicine, academics, athletics and public health and consider the ethical implications of those applications. Throughout the class active participation and an open mind will be critical to success. The final weeks of class will be dedicated to student designed studies or interventions aimed to further explore the power of self-fulfilling prophecies, placebo effects, and the social-psychological creation of reality.

PSYCH 25N. Psychology, Inequality, and the American Dream. 3 Units.

Despite legal prohibitions against discrimination and the fact that many people endorse egalitarian values, inequality persists in America. What role do psychological factors play in perpetuating inequality? How can psychologically "wise" reforms promote equal opportunity? Topics include prejudice and discrimination, school achievement, social class, and race/ethnicity.

PSYCH 26N. Language Acquisition: Exploring the Minds of Children. 3 Units.

Language is an extraordinary competence distinguishing humans from other species, yet there is debate about the role of biology in guiding language acquisition. Does language development follow an innate program or does it build on more general cognitive abilities, influenced by early experience? Topics include biological and experiential influences on the emergence of linguistic ability as children learn a first language. Discussions of theory and research, visits to Stanford laboratories and observations of very young language learners.

PSYCH 27N. The Psychology of Prejudice. 3 Units.

Preference to freshmen. Social psychological theories and research on stereotypes, prejudice, discrimination, and racism. Psychological perspectives include those emphasizing personologic, cognitive, motivational, and sociocultural contributions to prejudice. Emphasis is on applying each approach to understanding real-world contexts such as educational and occupational contexts, and to the implications of this research for efforts to reduce prejudice and discrimination.

PSYCH 29N. Growing Up in America. 3 Units.

Preference to freshmen. To what extent is it possible to describe an "American" experience? How are different people included in or excluded from the imagined community that is America? How do a person's race, class, gender and sexuality affect his or her experience of belonging to this country? These are just some of the questions we will consider as we familiarize ourselves with the great diversity of childhood and young adult experiences of people who have grown up in America. We will read and discuss narratives written by men and women, by urban, suburban, and rural Americans, and by Asian Americans, African Americans, Native Americans, Latina/os, and European Americans.

PSYCH 30. Introduction to Perception. 3 Units.

Behavioral and neural aspects of perception focusing on visual and auditory perception. Topics include: scientific methods for studying perception, anatomy and physiology of the visual and auditory systems, color vision, depth perception, motion perception, stereopsis, visual recognition, pitch and loudness perception, speech perception, and reorganization of the visual system in the blind.

PSYCH 35. Minds and Machines. 4 Units.

(Formerly SYMSYS 100). An overview of the interdisciplinary study of cognition, information, communication, and language, with an emphasis on foundational issues: What are minds? What is computation? What are rationality and intelligence? Can we predict human behavior? Can computers be truly intelligent? How do people and technology interact, and how might they do so in the future? Lectures focus on how the methods of philosophy, mathematics, empirical research, and computational modeling are used to study minds and machines. Undergraduates considering a major in symbolic systems should take this course as early as possible in their program of study. Same as: LINGUIST 35, PHIL 99, SYMSYS 1

PSYCH 45. Introduction to Learning and Memory. 3 Units.

The literature on learning and memory including cognitive and neural organization of memory, mechanisms of remembering and forgetting, and why people sometimes falsely remember events that never happened. Cognitive theory and behavioral evidence integrated with data from patient studies and functional brain imaging. Required prerequisite: PSYCH 1.

PSYCH 50. Introduction to Cognitive Neuroscience. 4 Units.

Survey of topics relating brain activity to cognitive processes and behavior. The course begins with an overview of neurophysiology and techniques to measure brain activity. We then discuss perceptual and motor processes before investigating neural responses related to attention, memory, and cognitive control. The course concludes with a discussion of brain processes related to reward, decision making, and social cognition.

PSYCH 50A. Practicum in Teaching: Intro to Cognitive Neuroscience. 3-4 Units.

TA training for Intro to Cognitive Neuroscience: preparing for sections, grading assignments, reviewing and answering questions in Canvas online forums and supporting office hours and review sections. Enrollment limited to teaching assistants for Psych 50: Intro to Cognitive Neuroscience. May be repeat for credit.

PSYCH 60. Introduction to Developmental Psychology. 3 Units.

Psychological development from birth to adulthood, emphasizing infancy and the early and middle childhood years. The nature of change during childhood and theories of development. Recommended: PSYCH 1.

PSYCH 60A. Introduction to Developmental Psychology Section. 2 Units.

Guided observation of children age 2-5 at Bing Nursery School. Corequisite: 60.

PSYCH 70. Self and Society: Introduction to Social Psychology. 3-4 Units.

Why do people behave the way they do? This is the fundamental question that drives social psychology. Through reading, lecture, and interactive discussion, students have the opportunity to explore and think critically about a variety of exciting issues including: what causes us to like, love, help, or hurt others; the effects of social influence and persuasion on individual thoughts, emotion, and behavior; and how the lessons of social psychology can be applied in contexts such as health, work, and relationships. The social forces studied in the class shape our behavior, though their operation cannot be seen directly. A central idea of this class is that awareness of these forces allows us to make choices in light of them, offering us more agency and wisdom in our everyday lives. This course is offered for 3-4 units. The 4 unit option has weekly discussion sections while the 3 unit version does not.

Same as: SOC 2

PSYCH 75. Introduction to Cultural Psychology. 5 Units.

The cultural sources of diversity in thinking, emotion, motivation, self, personality, morality, development, and psychopathology.

PSYCH 80. Introduction to Personality and Affective Science. 3 Units.

How do we measure personality and emotion? What parts of your personality and emotions are set at birth? What parts of your personality and emotions are shaped by your sociocultural context? Can your personality and emotions make you sick? Can you change yours personality and emotions? There are questions we begin to address in this introductory course on personality and emotion. Prerequisite: Psych 1.

PSYCH 90. Introduction to Clinical Psychology. 3 Units.

History of clinical psychology, models and assessment of personality, behavior, cognition, psychopathology, and approaches to the treatment of abnormal behavior. Emphasis is on current theory, research, issues in, and the role of clinical psychology in contemporary society. Recommended: 1.

PSYCH 95. Introduction to Abnormal Psychology. 3 Units.

Theories of and approaches to understanding the phenomenology, etiology, and treatment of psychological disorders among adults and children. Research findings and diagnostic issues. Recommended: PSYCH 1.

PSYCH 101. Community Health Psychology. 4 Units.

Social ecological perspective on health emphasizing how individual health behavior is shaped by social forces. Topics include: biobehavioral factors in health; health behavior change; community health promotion; and psychological aspects of illness, patient care, and chronic disease management. Prerequisites: HUMBIO 3B or PSYCH 1, or equivalent. Same as: HUMBIO 128

PSYCH 101S. Introduction to Neuroscience. 4 Units.

Introduction to structure and function of the nervous system. The course first surveys neuroscience research methods, physiology, and gross anatomy. We then study the brain systems which produce basic functions such as perception and motion, as well as complex processes like sleep, memory, and emotion. Finally, we examine these principles in cases of neurological and psychiatric disorders.

PSYCH 102. Longevity. 4 Units.

Interdisciplinary. Challenges to and solutions for the young from increased human life expectancy: health care, financial markets, families, work, and politics. Guest lectures from engineers, economists, geneticists, and physiologists. Same as: HUMBIO 149L, NENS 202

PSYCH 102S. Introduction to Neuroscience. 4 Units.

Introduction to structure and function of the nervous system. The course first surveys neuroscience research methods, physiology, and gross anatomy. We then study the brain systems which produce basic functions such as perception and motion, as well as complex processes like sleep, memory, and emotion. Finally, we examine these principles in cases of neurological and psychiatric disorders.

PSYCH 103. Intergroup Communication. 3 Units.

In an increasingly globalized world, our ability to connect and engage with new audiences is directly correlated with our competence and success in any field. How do our intergroup perceptions and reactions influence our skills as communicators? This course uses experiential activities and discussion sections to explore the role of social identity in effective communication. The objective of the course is to examine and challenge our explicit and implicit assumptions about various groups to enhance our ability to successfully communicate across the complex web of identity.

Same as: CSRE 103

PSYCH 103F. Intergroup Communication Facilitation. 1 Unit.

This is a TA training course for Psych 103 - Intergroup Communication. Same as: CSRE 103F

PSYCH 104. Uniquely Human. 3 Units.

Are humans the only species that displays altruism, experiences uncertainty, and is capable of language and deception? Sources include empirical and theoretical papers in comparative psychology. Prerequisite: 1.

PSYCH 104S. Affective Science. 3 Units.

This course will provide an introduction to a growing field known as affective science, which focuses on the study of emotion and other related phenomena (i.e., motivation, pain, etc.). We will explore core questions in affective science, including: 1) What is emotion and why is it useful? 2) How do emotions influence the way we perceive, attend to, and understand the world? 3) How do emotions become dysfunctional, and how can individuals control them? We will attempt to approach these questions from multiple perspectives, including i) neurobiological ii) behavioral, and iii) sociocultural perspectives.

PSYCH 105. Social Neuroscience. 4 Units.

Over the last 20 years, neuroscientists have become increasingly interested in studying topics that were previously the purview of social psychologists. In this seminar, we will survey neuroimaging research on topics such as self perception, person perception, empathy, and social influence. More broadly, we will consider the contributions that neuroscience can (and cannot) make to social psychological theory. Students will be responsible for leading discussions and producing one in-depth review or research paper at the end of the quarter.

PSYCH 105S. General Psychology. 3 Units.

In what ways does the scientific study of psychology increase our understanding of the thoughts, feelings, and behaviors we observe and experience in everyday life? What are the main areas of psychology and the different questions they seek to answer? This course will give you an introduction to the field of psychology and its many different areas. You will learn about the central methods, findings, and unanswered questions of these areas, as well as how to interpret and critically evaluate research findings.

PSYCH 106. Seminar on Visual Development. 3 Units.

Describe basic development of visual system, introduce research methods/experimental designs, and present pathologies of visual development.

PSYCH 107. Visual Processing of Faces. 2-3 Units.

How do we perceive a face, recognize its identity or judge its subtle communicative cues (e.g. emotion or intention)? How does our ability to visually process faces develop with age and change throughout our life span? What is the role of nature vs. nurture in this development? How do social attitudes, culture and face perception interact? In addressing these questions, we will learn about behavioral, electrophysiological and neuroimaging approaches to understanding face processing and critically examine the theories and original research that have defined the field. The course is designed to give you an in depth understanding of face processing while exposing you to methods and ideas that are useful in evaluating a wide range of cognitive neuroscience research.

PSYCH 107S. Introduction to Social Psychology. 3 Units.

A comprehensive overview of social psychology with in-depth lectures exploring the history of the field, reviewing major findings and highlighting areas of current research. Focus is on classic studies that have profoundly changed our understanding of human nature and social interaction, and, in turn, have triggered significant paradigm shifts within the field. Topics include: individuals and groups, conformity and obedience, attraction, intergroup relations, and judgment and decision-making.

PSYCH 108. Longevity through Film. 3 Units.

The media informs the understanding of life stages and shapes expectations about our futures. This course will explore the realities and fictions about life-span development through film. This course will revolve around selected films compared with the literature on life stages. Guest filmmakers, psychologists, sociologists and thought leaders will join the class to discuss human development.

PSYCH 108S. Introduction to Social Psychology. 3 Units.

This course aims to blend a comprehensive overview of social psychology with in-depth lectures exploring the history of the field, reviewing major findings and highlighting areas of current research. The course will focus on classic studies that have profoundly changed our understanding of human nature and social interaction, and, in turn, have triggered significant paradigm shifts within the field. Some of the topics covered in this class will include: individuals and groups, conformity and obedience, attraction, intergroup relations, and judgment and decision-making. The course, overall, will attempt to foster interest in social psychology as well as scientific curiosity in a fun, supportive and intellectually stimulating environment.

PSYCH 109. An introduction to computation and cognition. 4 Units.

How does the mind process information in order to choose good actions given the tangle of experience? The studies of computation and cognition synergise in diverse and powerful ways, from precise models of thinking to analysis of large behavioral data sets. In this course we will investigate questions of information representation and processing through a combination of lectures, hands-on ('flipped classroom') exercises, and extended homework assignments. We will explore method for psychological data analysis and three of the main computational approaches to modeling the mind: reinforcement learning, neural networks, and Bayesian inference. Using these tools we will explore human abilities such as reasoning and social cognition. Prerequisites: Psych 1 and CS 106a (or consent of instructor).

PSYCH 109S. Introduction to Cognitive Neuroscience. 3 Units.

3) Introduction of the neurobiology of behavior including the biology of nervous system, the neural basis for perception, learning, memory, decision making and neurological disorders. Introduction to different research techniques that are prevalent in current neuroscience studies including fMRI, EEG, TMS and single unit recording.

PSYCH 110. Research Methods and Experimental Design. 5 Units.

Structured research exercises and design of an individual research project. Prerequisite: consent of instructor.

PSYCH 111S. Abnormal Psychology. 3 Units.

This course will provide an introduction to abnormal psychology. It will be targeted towards students who have had little or no exposure to coursework on mental disorders. The course will have three core aims: 1) Explore the nature of mental disorders, including the phenomenology, signs/symptoms, and causal factors underlying various forms of mental illness, 2) Explore conventional and novel treatments for various mental disorders, 3) Develop critical thinking skills in the theory and empirical research into mental disorders. The course will explore a wide range of mental disorders, including depression, anxiety, schizophrenia, addiction, eating disorders, and personality disorders.

PSYCH 113S. Developmental Psychology. 3 Units.

This class will introduce students to the basic principles of developmental psychology. As well as providing a more classic general overview, we will also look towards current methods and findings. Students will gain an appreciation of how developmental psychology as a science can be applied to their general understanding of children and the complicated process of growing into adults.

PSYCH 115S. Personality Psychology. 3 Units.

This course will focus on current empirical and theoretical approaches to personality. Lectures will be organized around the following questions central to personality research: How and why do people differ? How do we measure individual differences? Does personality change over time? How does personality interact with sociocultural factors to influence behavior? What makes people happy? What are the physical, mental, and social consequences of personalities?.

PSYCH 118F. Literature and the Brain. 5 Units.

Recent developments in and neuroscience and experimental psychology have transformed the way we think about the operations of the brain. What can we learn from this about the nature and function of literary texts? Can innovative ways of speaking affect ways of thinking? Do creative metaphors draw on embodied cognition? Can fictions strengthen our "theory of mind" capabilities? What role does mental imagery play in the appreciation of descriptions? Does (weak) modularity help explain the mechanism and purpose of self-reflexivity? Can the distinctions among types of memory shed light on what narrative works have to offer?. Same as: ENGLISH 118, ENGLISH 218, FRENCH 118, FRENCH 318

PSYCH 119. Psychology and Public Policy. 5 Units.

Applications of psychology to public and social policy. Factors that affect the influence of psychological research and individual psychology on the creation of policy, and the influence of policy on attitudes and behavior at the personal and societal levels. Topics include education, health care, and criminal justice.

PSYCH 119S. The Psychology of Stigma. 3 Units.

What obese people, African Americans, people with physical disabilities, lesbians, and Muslims have in common: social stigma. The social and psychological experiences of individuals living with social stigmas. Classic and current theory and research. Topics include: function, nature, and types of stigma; how stigmatized individuals view their identities and cope; mental and cognitive consequences; and interactions between stigmatized and non-stigmatized. Literature employing research methods including neuroimaging and social interaction studies.

PSYCH 120. Cellular Neuroscience: Cell Signaling and Behavior. 4 Units.

Neural interactions underlying behavior. Prerequisites: PSYCH 1 or basic biology. Same as: BIO 153

PSYCH 121. Ion Transport and Intracellular Messengers. 3 Units.

(Graduate students register for 228.) Ion channels, carriers, ion pumps, and their regulation by intracellular messengers in a variety of cell types. Recommended: 120, introductory course in biology or human biology. Same as: PSYCH 228

PSYCH 124S. Applying Psychology to Modern Life. 3 Units.

A scientific examination of everyday modern life. Topics include: how research on attention and memory can be applied to improve study strategies; how advertisers persuade and how their techniques can be resisted; how interpersonal conflicts can be avoided through knowledge of common errors in judging other people; and how studies on attraction and love can improve close relationships.

PSYCH 125S. Language and Thought. 3 Units.

How are we able to produce and comprehend language in all its complexity? How does language processing interact with other parts of cognition? In this course, we will focus on several main themes: language production and comprehension, discourse, language acquisition, bilingualism, and linguistic relativity. We will explore these themes through lecture, demonstrations, analysis of empirical work, and student-led discussion. Special attention will also be given to the various experimental methods we use to conduct psycholinguistic and developmental research (e.g., self-paced reading, eye-tracking, cross-modal priming, and neural imaging).

PSYCH 129. Happiness, Well-Being, Gender. 1-3 Unit.

Exploring the meaning and attainment of psychological well-being and happiness, this course will address gender differences in well-being and approaches that can be used by all individuals to improve their state of happiness and well-being. Course literature will be drawn primarily from social, clinical, and positive psychology, but will be drawn from other disciplines as well. Students will actively engage with course material by critiquing studies, discussing research, and applying methods for improving well-being to their daily lives. Same as: FEMGEN 156

PSYCH 130. Experimental Pragmatics. 3 Units.

How do we understand language as it is used in context? Pragmatic reasoning allows us to go beyond the literal semantics of what someone says to infer what they actually meant. This course will be an in-depth investigation of recent experimental work on pragmatics. Students will read the primary research literature as they learn the skills necessary to develop and run an original experiment investigating our pragmatic inference abilities. Required: Psych 131, Linguist 130A, Linguist 188, or permission of instructor.

PSYCH 130A. NARRATIVE PSYCHOLOGY. 3 Units.

This is an exploration of how human experience is remembered, organized, and transformed through stories people tell about their lives. Through a multicultural perspective we examine how narrative approaches in human development and health care offer promising ways to psychological and social wellness. We integrate transdisciplinary scholarship, traditional cultural wisdom, and self-reflective, experiential learning to connect our academic work with our personal lives.

PSYCH 130S. Positive Psychology: Happiness & Well-Being. 3 Units.

Exploring the meaning and attainment of psychological well-being and happiness, this course investigates approaches that can be used by all individuals to improve their state of happiness and well-being. Course literature is drawn primarily from social, clinical, and positive psychology, but is also drawn from other disciplines as appropriate. In this course, students will actively engage with course material by critiquing studies, discussing research, and applying methods for improving well-being to their daily lives.

PSYCH 131. Language and Thought. 4 Units.

The psychology of language including: production and understanding in utterances; from speech sounds to speaker's meaning; children's acquisition of the first language; and the psychological basis for language systems. Language functions in natural contexts and their relation to the processes by which language is produced, understood, and acquired. Prerequisite: 1 or LINGUIST 1. Same as: LINGUIST 131, PSYCH 262

PSYCH 132A. Navigating Race and Identity in America: The Role of Psychology in Racial Interactions. 4 Units.

How have social institutions and historical factors led to the belief systems and stereotypes that shape how race is experienced in American society, and how do these belief systems affect the way individuals within racial groups come to view and define themselves? This course will serve as an introduction to how people's psychology how they think, feel, and act shapes their experience of race and identity in America. After a brief discussion about the structural and systemic origins of the racial status quo, we will examine the way that individuals navigate the social and racial landscape of modern-day America. Complementing courses that take sociological approaches to race in America, this course will focus on how individuals' perceptions and thoughts about the world affect how they interpret and respond to social situations. For example, the course will address: how stereotypes about one's race or identity can cause individuals to feel threatened, and can undermine health, feelings of belonging, and academic performance; how an individual's concerns about the thoughts and beliefs of others can radically affect identity formation, particularly during adolescence; how individuals have to navigate multiple cultural identities, especially as minority group members contending with mainstream ideas that differ from their own; how majority group members (e.g., Whites) view their role in racial systems, and how they deal with concerns about being or appearing prejudiced; how interventions can use social psychological concepts to mitigate negative outcomes of racial inequality; We will then use our understanding of these concepts to examine and consider different racial situations throughout American society and to understand how individuals navigate and experience race and identity. Throughout the course, we will watch films, read literature, and analyze music and art that reflect the experience of race and identity. Same as: CSRE 118F

PSYCH 132S. The Neglected Senses: Hearing, Touch, Smell and Taste. 3 Units.

Whereas psychology and neuroscience have made great strides in understanding how we perceive the world through all five of our senses, most undergraduate courses focus primarily on vision. The most popular undergraduate perception textbooks devote less than half of their pages to all four other senses. This course will be devoted to these neglected senses: hearing, taste, olfaction and touch. The course will provide answers for the following questions: What stimuli activate the senses of hearing, taste, olfaction and touch? How do we detect that these stimuli are there? How does the brain process information from the senses? How do the senses affect each other? And what can we learn from studying people's behavior alone (using psychological methods)?

PSYCH 134. Seminar on Language and Deception. 3 Units.

Deceptive, exploitative, and other noncooperative uses of language. How is language used to deceive or exploit? Where are these techniques practiced and why? What are the personal, ethical, and social consequences of these practices? Prerequisite: 131, LINGUIST 1, or PHIL 181.

Same as: LINGUIST 134

PSYCH 134S. The Art and Science of Emotional Intelligence. 3 Units.

Emotional intelligence has been promoted as essential in finding meaning and fulfillment in our work and relationships. This course is designed to provide an introduction to research and theory on emotional intelligence as a relatively new concept in psychology that has profound influence in education, health, and business. We will critically review it as a scientific concept, looking at the research and the biological bases for emotional intelligence. We will then explore its four basic areas of self understanding, self management, social understanding, and social management. For each area we will engage in self reflection and learn and practice ways of enhancing our emotional intelligence.

PSYCH 136S. Learning and Memory: Theory and Applications. 3 Units.

This course explores how our behavior in the present is guided by our past experiences, and how we can apply these principles to our own learning and to the broader world around us. We will explore the theory of learning and memory, including an introduction to multiple memory systems, the ways in which memory can succeed but also fail, and how memory integrity changes across the lifespan and across clinical populations. We will also explore applications of this theoretical content to the real world technologies and policies that touch our everyday lives, such as applications in brain training, advertising, the legal system, and the classroom.

PSYCH 138. Wise Interventions. 4 Units.

Classic and contemporary psychological interventions; the role of psychological factors in social reforms for social problems involving healthcare, the workplace, education, intergroup, relations, and the law. Topics include theories of intervention, the role of laboratory research, evaluation, and social policy.

Same as: PSYCH 238, PUBLPOL 238

PSYCH 138S. Motivation to Learn. 3 Units.

Why do some students delight at the thought of challenging tasks while others only care about getting the grade? Why do some seek out opportunities to learn in and out of school while others feel anxious just showing up to class? Why do our failures sometimes debilitate and other times invigorate? How do we turn our desires to achieve into concrete action? Where do these motivational processes come from and how might we use our understanding of motivation to improve educational systems? This course will address these and other fascinating questions as we consider theory and research on motivation, primarily as it applies to educational contexts. The course will be based largely around interactive discussions of primary source articles, with some lecture in order to provide you with important background information and a framework for discussing the readings.

PSYCH 139S. Psychology of Women. 3 Units.

Women comprise half of the human population, yet throughout much of history, the study of human thought and behavior has been largely male focused. In fact, some of the earliest psychological studies of women were conducted primarily to argue for the evolutionary supremacy of men. During the past fifty years, the field of psychology has made significant strides towards considering women and men equally worthy subjects of inquiry. In this course, we will discuss this growing body of research related to gender and the female experience. We will focus on six main themes: social and biological approaches to studying gender, evidence for gender similarities and differences, gender stereotypes and sexism, gender and language use, women in the workplace, and female sexuality. We will explore these themes through lectures, in class demonstrations, analysis of empirical work, and student led discussion.

PSYCH 140. Introduction to Psycholinguistics. 4 Units.

How do people do things with language? How do we go from perceiving the acoustic waves that reach our ears to understanding that someone just announced the winner of the presidential election? How do we go from a thought to spelling that thought out in a sentence? How do babies learn language from scratch? This course is a practical introduction to psycholinguistics – the study of how humans learn, represent, comprehend, and produce language. The course aims to provide students with a solid understanding of both the research methodologies used in psycholinguistic research and many of the well-established findings in the field. Topics covered will include visual and auditory recognition of words, sentence comprehension, reading, discourse and inference, sentence production, language acquisition, language in the brain, and language disorders. Students will conduct a small but original research project and gain experience with reporting and critiquing psycholinguistic research.

Same as: LINGUIST 145

PSYCH 140S. Sport Psychology. 3 Units.

Focus is on research methods and findings and how to apply these findings to students' own performance. Topics include methods of performance enhancement, psychological characteristics of top performers, group dynamics and processes, effective leadership practices, the effects of stereotyping on sport participation and performance, and debates in the field. Emphasis will be on sports, although most topics can be applied to performance in general.

PSYCH 141. Cognitive Development. 3 Units.

This course aims to offer an understanding of how human cognition – the ability to think, reason, and learn about the world – changes in the first few years of life. We will review and evaluate both classic findings and state-of-the-art research on cognitive development, and learn about the methods used to reveal what children know and think about the world. The course will help students to understand, discuss, and critically evaluate the major theories and explanations of intellectual growth, and consider implications of cognitive development research on real-world issues in education and social policy. Prerequisites: Psych 1.

PSYCH 141S. Health Psychology. 3 Units.

Why is it so difficult for people to stick to an exercise plan? Why don't people take their doctor's advice? Why aren't public health announcements more effective? This course addresses these questions by providing an overview of health psychology: the scientific study of behaviors and cognitive processes related to health states. In this course, we will discuss the mind/body connection, the influence of social/cultural and physical environments on our health, cognitive processing of health information, health belief models, and the link between emotion and health. Understanding the interactions between these biological, psychological, and social influences on individuals' health states is crucial for developing effective health communication and intervention programs. We will approach all course topics from both theory-driven and applied perspectives.

PSYCH 142S. The Psychology of Social Media. 3 Units.

People interact with the world around them largely through mediated means ζ internet, television, radio, etc. This course will survey current social media ζ e.g. Facebook, Twitter, YouTube, etc ζ and popular culture in order to highlight the psychological processes at play. Topics will include: social belonging, interpersonal attraction, identity, bias, and cyberbullying. Students will be expected to learn how to study social media and popular culture using psychological methods.

PSYCH 143. Developmental Anomalies. 3 Units.

For advanced students. Developmental disorders and impairments. What the sparing of mental abilities in otherwise devastating disorders (or vice versa) tells about the mind and its development in the normal case. Examples of disorders and impairments: autism, congenital blindness, deafness, mental retardation, attachment disorder, and Williams syndrome. Limited enrollment. Prerequisite: consent of instructor.

PSYCH 143S. The Psychology of Mean Girls. 3 Units.

This course examines the phenomenon of relational aggression and its implications on girls' lives and relationships. Using the theoretical lenses of moral and social psychology, we will consider how girls experience relational aggression and how it affects their friendships and other social negotiations. While adolescents will be the main focus group, examples from college-age and older girls will also be considered. Classwork will include case studies, reflection papers, and a final research paper on a related topic of the students' choice.

PSYCH 145. Seminar on Infant Development. 1-2 Unit.

For students preparing honors research. Conceptual and methodological issues related to research on developmental psycholinguistics; training in experimental design; and collection, analysis, and interpretation of data.

PSYCH 145S. Close Relationships. 3 Units.

Relationships are central to the human experience, and relationship science seeks to understand how our connections to others shape how we think, feel, and act. The purpose of this course is to explore the classic and current research and theory on close relationships in the field of psychology. Some of the topics we will explore are friendship, attraction, love, familial ties, conflict, social cognition, interdependency, sexuality, loss, and the sociocultural shaping of relationships. The course, in part, aims to create budding relationship scientists, who can turn their real-world interests and observations into testable hypotheses with the methods and tools of the field.

PSYCH 146. Observation of Children. 3-5 Units.

Learning about children through guided observations at Bing Nursery School, Psychology's lab for research and training in child development. Physical, emotional, social, cognitive, and language development. Recommended: 60.

PSYCH 146S. Brain, Mind, and Behavior. 3 Units.

How does the complexity of human behavior arise from the mind and brain? This course surveys approaches to linking these three concepts. We will introduce the brain with a hands-on neuroanatomy demo. We will explore how neurons manipulate signals to communicate, transforming our sensory experiences into rich internal representations, used to guide our attention, decision-making, and social interactions. We will immerse ourselves in the methods of cognitive neuroscientists, tinkering with models linking brain signals with behavior, learning how those signals are recorded (e.g. fMRI and EEG) and perturbed (e.g. TMS), and fine-tuning our ability to design psychological experiments. We will think about how these concepts apply in our own lives, while also learning to critically assess current research.

PSYCH 147. Development in Early Childhood. 3-5 Units.

Supervised experience with young children at Bing Nursery School. 3 units require 4 hours per week in Bing classrooms throughout the quarter; 4 units require 7 hours per week; 5 units require 10.5 hours per week. Seminar on developmental issues in the Bing teaching/learning environment. Recommended: 60 or 146, or consent of instructor.

PSYCH 147S. Introduction to the Psychology of Emotion. 3 Units.

Our emotions influence how we perceive the world, inform how we make critical life decisions, and connect us with other people. Affective science, the scientific study of emotion, investigates how emotions shape our lives. In this course, we explore how emotions arise as feelings we experience, behaviors we commit, and physiological reactions to our environments. Across these levels of analysis, we will consider how emotions interact with our personalities, past experiences, future goals, stages of development, and socio-cultural surroundings. We will learn how affective science has clarified the nature of emotion, how emotions evolved across diverse animal species, and how emotions impact our health and relationships with others. You will leave this class with an improved, scientifically-informed understanding of your own and others emotions, and strategies for how to effectively use and manage your feelings in daily life.

PSYCH 148S. The Psychology of Bias: Stereotyping, Prejudice, and Discrimination. 3 Units.

From Black Lives Matter to mansplaining, issues of stereotyping, prejudice, and discrimination grab our attention and draw our concern. This course brings together research from social, cognitive, affective, developmental, cultural, and neural perspectives to examine the processes that reflect and perpetuate group biases. Along with these various research perspectives, we will consider perspectives of both privileged and disadvantaged group members. Where do stereotypes come from? Why is race so hard to talk about? Can we be biased without knowing it? How can we reduce prejudice and conflict? We will address these and other questions through lectures, class discussion, and group presentations.

PSYCH 149. The Infant Mind: Cognitive Development over the First Year. 3 Units.

How do babies learn so much in so little time? Emphasis is on cognitive and perceptual development, and the relationship between brain and behavior in infancy. Prerequisite: 1. Recommended: 60 or 141.

PSYCH 150. Race and Crime. 3 Units.

The goal of this course is to examine social psychological perspectives on race, crime, and punishment in the United States. Readings will be drawn not only from psychology, but also from sociology, criminology, economics, and legal studies. We will consider the manner in which social psychological variables may operate at various points in the crimina; justice system- from policing, to sentencing, to imprisonment, to re-entry. Conducted as a seminar. Students interested in participating should attend the first session and complete online application for permission at <https://goo.gl/forms/CAut7RKX6MewBluG3>. Same as: CSRE 150A

PSYCH 150B. RACE AND CRIME PRACTICUM. 2-4 Units.

This practicum is designed to build on the lessons learned in Psych 150: Race & Crime. In this community service learning course, students will participate in community partnerships relevant to race and crime, as well as reflection to connect these experiences to research and course content. Interested students should complete an application for permission at: <https://goo.gl/forms/CAut7RKX6MewBluG3>. Prerequisite: Psych 150 (taken concurrently or previously). Same as: CSRE 150B

PSYCH 151. Emotion Regulation and Psychopathology. 3 Units.

A broad overview of specific emotion regulation impairments in various psychopathologies and discussion of how current treatment protocols are likely to aid recovery by forming more adaptive emotion regulation ability. Topics include: Foundations and Emotion regulation models, Emotion regulation impairments in Mood disorders (Unipolar Depression and Bipolar Disorder), Anxiety disorders (Social Phobia, Post Traumatic Stress Disorder, General Anxiety Disorder), Eating disorders (Anorexia and Bulimia Nervosa), and Personality Disorders (Narcissistic Personality Disorder, Borderline Personality Disorder).

PSYCH 152. Mediation for Dispute Resolution. 3 Units.

Mediation as more effective and less expensive than other forms of settling disputes such as violence, lawsuits, or arbitration. How mediation can be structured to maximize the chances for success. Simulated mediation sessions.

Same as: EDUC 131

PSYCH 152F. Doing Race and Ethnicity: How and Why it Matters. 3 Units.

Going to school and work, renting an apartment, going to the doctor, watching television, voting, reading, and attending religious services are all activities that involve doing consciously or unconsciously race and ethnicity. In this course, we draw from history, psychology, genetics, and literary studies to understand contemporary racial formations and cultural representations. Course will include two 50-minute lectures with a required online discussion section. Enrollment capped at 20 students.

PSYCH 154. Judgment and Decision-Making. 3 Units.

Survey of research on how we make assessments and decisions particularly in situations involving uncertainty. Emphasis will be on instances where behavior deviates from optimality. Overview of recent works examining the neural basis of judgment and decision-making.

PSYCH 155. Introduction to Comparative Studies in Race and Ethnicity. 5 Units.

How different disciplines approach topics and issues central to the study of ethnic and race relations in the U.S. and elsewhere. Lectures by senior faculty affiliated with CSRE. Discussions led by CSRE teaching fellows. Includes an optional Haas Center for Public Service certified Community Engaged Learning section.

Same as: COMPLIT 195, CSRE 196C, ENGLISH 172D, SOC 146, TAPS 165

PSYCH 156. Communicating Neuroscience. 3 Units.

Understanding the structure and function of the brain is presently an international goal with Brain Initiatives in the United States, Europe, and Japan. Due to this global interest, knowledge about the brain is influencing all aspects of society. As such, accurate communication and translation of neuroscience findings are of utmost importance. This course will examine ways to translate and to communicate neuroscience research for public outreach, with a focus on the role of technology. Topics include: television, feature articles, blogs, documentaries, and online videos. Students will learn different ways to accurately translate and communicate neuroscience topics in the context of theoretical and methodological approaches and to apply these tools in an original way to generate a completed outreach piece by the end of the course.

PSYCH 157. Social Foundations of Expertise and Intelligence. 3 Units.

Psychological conceptions of expertise, ability, and intelligence and the research methods used to study these attributes. Topics include: research on how expertise in a diverse set of disciplines is developed; the role of practice in nurturing expertise; whether intelligence predicts life outcomes; the genetic and environmental determinants of intelligence; whether genes or environment explain racial differences such as the Black-White performance gap and the East Asian achievement advantage; and the Flynn effect.

PSYCH 158. Emotions: History, Theories, and Research. 1-3 Unit.

Graduate students register for 259. Theoretical and empirical issues in the domain of emotions. The history of emotion theories, current approaches, and the interaction between emotion and cognition.

Same as: PSYCH 259

PSYCH 159. Psychology of Attitude Change and Social Influence. 3 Units.

Review of classic and current research on attitudes, attitude change and persuasion. Increase appreciation for the ways that our thoughts, actions, and feelings are shaped and manipulated by social influences.

PSYCH 161. Emotion. 3 Units.

(Graduate students register for 261.) The scientific study of emotion. Topics: models of emotion, emotion antecedents, emotional responses (facial, subjective, and physiological), functions of emotion, emotion regulation, individual differences, and health implications. Focus is on experimentally tractable ideas.

Same as: PSYCH 261

PSYCH 164. Brain decoding. 3 Units.

Can we know what someone is thinking by examining their brain activity? Using knowledge of the human visual system and techniques from machine learning, recent work has shown impressive ability to decode what people are looking at from their brain activity as measured with functional imaging. The course will use a combination of lectures, primary literature readings, discussion and hands-on tutorials to understand this emerging technology from basic knowledge of the perceptual (primarily visual) and other cognitive systems (such as working memory) to tools and techniques used to decode brain activity. Prerequisites: Either Psych 30 or Psych 50 or Consent of Instructor.

PSYCH 167. Seminar on Aggression. 3 Units.

The causes and modification of individual and collective aggression. Major issues in aggression: social labeling of injurious conduct, social determinants of aggression, effects of the mass media, institutionally sanctioned violence, terrorism, psychological mechanisms of moral disengagement, modification of aggressive styles of behavior, and legal sanctions and deterrence doctrines.

PSYCH 168. Emotion Regulation. 3 Units.

(Graduate students register for 268.) The scientific study of emotion regulation. Topics: historical antecedents, conceptual foundations, autonomic and neural bases, individual differences, developmental and cultural aspects, implications for psychological and physical health. Focus is on experimentally tractable ideas.

Same as: PSYCH 268

PSYCH 169. Advanced Seminar on Memory. 3 Units.

Memory and human cognition. Memory is not a unitary faculty but consists of multiple systems that support learning and remembering, each with its own processing characteristics and neurobiological substrates. This advanced undergraduate seminar will consider recent discoveries about the cognitive and neural architectures of working, declarative, and nondeclarative memory. Required: 45.

PSYCH 170. The Psychology of Communication About Politics in America. 4-5 Units.

Focus is on how politicians and government learn what Americans want and how the public's preferences shape government action; how surveys measure beliefs, preferences, and experiences; how poll results are criticized and interpreted; how conflict between polls is viewed by the public; how accurate surveys are and when they are accurate; how to conduct survey research to produce accurate measurements; designing questionnaires that people can understand and use comfortably; how question wording can manipulate poll results; corruption in survey research.

Same as: COMM 164, COMM 264, POLISCI 124L

PSYCH 171. Research Seminar on Aging. 4 Units.

Two quarter practicum exposes students to multiple phases of research by participating in a laboratory focusing on social behavior in adulthood and old age. Review of current research; participation in ongoing data collection, analysis, and interpretation. Prerequisites: 1, research experience, and consent of instructor. May be repeated for credit.

PSYCH 172. Self-fashioning. 3 Units.

This undergraduate and graduate seminar will examine philosophical and psychological literature relevant to self-fashioning. Meetings will be discussion oriented, and each meeting will focus on a different question of theoretical and applied significance. Prerequisite: consent of instructor. May be repeat for credit.

Same as: PHIL 186A, PHIL 286A

PSYCH 175. Social Cognition and Learning in Early Childhood. 3 Units.

Social cognition is the ability to recognize others, understand their behaviors, and reason about their thoughts. It is a critical component of what makes us human. What are the basic elements of social cognition, and what do children understand about other people's actions, thoughts, and feelings? How do these capacities help us understand the world, as learning unfolds in the first few years of life? This course will take a deeper look at the intersection of social cognition and cognitive development to better understand how children learn about the world. Students will explore various topics on social cognition with an emphasis on (but not limited to) developmental perspectives, including face perception, action understanding, Theory of Mind, communication, and altruism, and think about how these abilities might be linked to the developmental changes in children's understanding of the world. The course will encourage students to think hard about the fundamental questions about the human mind and how it interacts with other minds, and the value of studying young children in addressing these questions. Students should expect to read, present, and discuss theoretical and empirical research articles and to develop original research proposals as a final project. Students will have an opportunity to develop their proposals into a research project in PSYCH 187, a lab course offered every other year in Spring (next offer expected to be Spring 2018) as a sequel to this course. This course fulfills the WIM requirement. Prerequisites: Psych60 or Psych141, or see instructor.

PSYCH 176. Biology, Culture and Family in Early Development. 3-4 Units.

Early childhood is a time of both enormous promise and vulnerability. Parents differ widely in their practices and beliefs about their role in enabling children to avoid risk and to achieve their potential for a healthy and productive life in the particular physical, social and cultural contexts of the communities and societies in which they live. In this seminar we will evaluate evidence from the biological and social sciences showing how experiences in infancy have profound and enduring effects on early brain architecture, with consequences for later language, cognitive, and socio-emotional development in childhood and adulthood. We will also consider the challenges of designing more effective social policies and programs to provide support for families in diverse socioeconomic and cultural contexts, who all want to help their children thrive. A community-service learning option, working with children as a reading tutor, is included for students taking this class for 4-units. Enrollment is limited and consent of instructor is required. Please send a brief statement of your interests, goals, and academic preparation relevant to the themes of this class to Prof. Fernald (afernald@stanford.edu). Pre-requisites: Psych 01 and Psych 60, or Human Biology 3B.

Same as: HUMBIO 147

PSYCH 178. New Methods for Old Questions: Linking Social Cognition and Social Cognitive Neuroscience. 3 Units.

Novel technology can fuel new discoveries and generate new questions for future research. For instance, looking-time methods for studying infants or response time (RT) measures in cognitive psychology have been enabled by the use of computers and video cameras. More recently, neuroimaging techniques (such as fMRI) have transformed the field by offering a more direct look into the working human brain. These methods are, in a way, old and new ways of studying what psychologists want to study: mental representations. What are the promises and challenges of using these methods to study human cognition and its development? What have we learned, where have we fallen short, and why? Most importantly, how can we make the most out of these new methods to bear on our understanding of social cognition and its development? After the first two weeks of lectures on basic methods, each week we will consider a topic that has been extensively studied in cognitive development literature. Topics will include: perception of agency, theory of mind, and morality; on each topic, we will compare two different ways of studying mental representations: the old way (behavior) and the new way (neural response) to assess their relative benefits and shortcomings, and to discuss the promises and pitfalls for combining the two. This course will be a combination of lectures, presentations, and discussions aimed primarily for upper-class undergraduate students or graduate students who do not have much background in neuroimaging methods, but interested in learning more about neuroimaging methods and think about how these methods can (and cannot) help address questions about social cognition and development. Prerequisite: Psych60 or Psych141, or see instructor.

PSYCH 180. Social Psychological Perspectives on Stereotyping and Prejudice. 4 Units.

The seminar will review classic and current literature from social psychology on stereotyping and prejudice. We will cover the perceiver's perspective including the formation and maintenance of stereotypes, the functions and costs of stereotyping, and stereotype change. We will also explore how targets are affected by stereotypes and prejudice, as well as intergroup relations. Recent research concerning the role of cognitive, affective, motivational and behavioral processes will be emphasized.

PSYCH 180A. SPARQshop: Social Psychological Answers to Real-world Questions. 3 Units.

Undergraduate and graduate students will work in teams to design, build, test, and distribute online toolkits that help practitioners solve real-world problems by applying social science. Graduate students can build toolkits for their own research. Students will learn how to assess the needs of practitioner audiences; write text, design graphics, and program activities for these audiences; prepare, deliver, and produce a TED-style online video; design surveys in Qualtrics; and build and user-test the toolkit. Readings and class discussions will include modules on design thinking, storytelling, science writing, information design, and impact evaluation. For an example of a toolkit in progress, please visit spaceref.org. Permission of instructor required. Same as: PSYCH 283A

PSYCH 182. Seminar in Applied Cognitive Development. 3 Units.

Much is known about how children learn. But how can this knowledge be used to create effective, age-appropriate health and educational interventions for children? This course surveys research in basic and applied cognitive development. Students will then have the opportunity to design an intervention for young children based on what they've learned. Recommended: Psych 60 or Psych 141.

PSYCH 183. SPARQ Lab. 3 Units.

Join SPARQ (Social Psychological Answers to Real-world Questions) as a research assistant and help with projects addressing real-world issues.

PSYCH 187. Research Design, Implementation, and Communication in Cognitive Development. 3-4 Units.

This course is offered primarily for students who have taken PSYCH175 (Winter) and wish to further develop their final papers into a research project. Students will learn how experiments are designed and conducted using young children as participants, whose task comprehension/compliance/attention span are all very different from adults. The goal of this course is to provide hands-on experiences in designing, creating, and adjusting stimuli/protocols, and through this process, help students understand how studying such populations, despite its difficulties, can help us answer some of the most interesting questions about the human mind. Students will experience all stages of designing and running an experiment with children within a structured time frame, and present their studies by presenting their work and writing a final paper at the end of the course. Students should expect to commit hours outside of class, for creating stimuli and collecting data. Prerequisites: PSYCH175, or see instructor.

PSYCH 189. Stanford Center on Longevity Practicum. 3 Units.

Student involvement in an interdisciplinary center aimed at changing the culture of human aging using science and technology. May be repeated for credit.

PSYCH 190. Special Research Projects. 1-6 Unit.

May be repeated for credit. Prerequisite: consent of instructor.

PSYCH 191. Special Research Projects in the Mind & Body Lab. 1-6 Unit.

May be repeated for credit or for grade. Prerequisites: consent of instructor.

PSYCH 192. Career and Personal Counseling. 3 Units.

Theories and methods for helping people create more satisfying lives for themselves. Simulated counseling experiences. Same as: EDUC 134, EDUC 234

PSYCH 193. Special Laboratory Research. 1-6 Unit.

May be repeated for credit. Prerequisites: 1, 10, and consent of instructor.

PSYCH 194. Reading and Special Work. 1-3 Unit.

Independent study. May be repeated for credit. Prerequisite: consent of instructor.

PSYCH 195. Special Laboratory Projects. 1-6 Unit.

Independent study. May be repeated for credit. Prerequisites: 1, 10, and consent of instructor.

PSYCH 196. Contemporary Psychology: Overview of Theory, Research, Applications. 3 Units.

Capstone experience for juniors and seniors that bridges course work with research opportunities. Lectures representing the department's areas: social, personality, developmental, neuroscience, and cognitive psychology. Faculty present current research. Discussions led by advanced graduate students in the field represented by that week's guest. Students write research proposals. Small grants available to students to conduct a pilot study of their proposed research. Limited enrollment. Prerequisite: consent of instructor.

PSYCH 196A. Advanced Psychology Research Methods. 3 Units.

This course is designed for advanced psychology students familiar with basic research methods (Honors and Coterms) who wish to build on and develop more sophisticated, independent research skills. Topics will include research design and evaluation, introductory statistics and basic programming in R, logistics of running a study at Stanford (including online studies with Qualtrics and Amazon's Mechanical Turk), interpreting and writing up the results of statistical analyses, giving an academic presentation, and more. Students will gain hands on, pragmatic skills in each of these areas through individual and group projects and presentations, problem sets, and instructor and peer feedback. By the end of the course, students will have the knowledge and skills they need to develop and execute their own independent research project (e.g., their honors or coterm thesis project).

PSYCH 197. Advanced Research. 1-4 Unit.

Limited to students in senior honors program. Weekly research seminar, independent research project under the supervision of an appropriate faculty member. A detailed proposal is submitted at the end of Autumn Quarter. Research continues during Winter and Spring quarters as 198. A report demonstrating sufficient progress is required at the end of Winter Quarter.

PSYCH 198. Senior Honors Research. 1-4 Unit.

Limited to students in the senior honors program. Finishing the research and data analysis, written thesis, and presentation at the Senior Honors Convention. May be repeated for credit.

PSYCH 199. Temptations and Self Control. 2 Units.

(Graduate students register for 299.) Why do people do things that they come to regret? How can people minimize behavior such as exercise avoidance, angry words, overeating, unsafe sex, and dangerous driving? Sources include classical and current research from experimental psychology, neuroscience, behavioral economics, and neuroeconomics. Real-world applications.

Same as: PSYCH 299

PSYCH 201. Social Psychology Lecture Series. 3 Units.

Required of social psychology graduate students. Guest lecturers from Stanford and other institutions. May be repeated for credit. (Miller).

PSYCH 201S. Bayesian Statistics for Psychologists. 3 Units.

Have you ever collected data and then not know how to analyze it? Bayesian data analysis is a general purpose data analysis approach for making explicit hypotheses about where the data came from (e.g. the hypothesis that data from 2 experimental conditions came from two different distributions). In this course, we will explore and learn how to use Bayesian data analytic tools for analyzing data from psychology experiments. Students will develop a strong foundation for statistical intuitions and build on these intuitions to conduct Bayesian analyses of experimental data. The course will focus on the practicalities of running Bayesian analyses, of describing analyses for purposes of publication, and of making inferences about data and design decisions for subsequent experiments. This course is ideal for graduate or advanced-undergraduate students in Psychology, Linguistics, and related fields, who conduct experiments on human behavior; also appropriate for students without experience in psychological experiments but with experience in statistics.

PSYCH 202. Cognitive Neuroscience. 3 Units.

Graduate core course. The anatomy and physiology of the brain. Methods: electrical stimulation of the brain, neuroimaging, neuropsychology, psychophysics, single-cell neurophysiology, theory and computation. Neuronal pathways and mechanisms of attention, consciousness, emotion, language, memory, motor control, and vision. Prerequisite: For psychology graduate students, or consent of instructor.

PSYCH 203. MODELS OF LANGUAGE ACQUISITION. 3 Units.

How do children learn to understand and produce their native language? Language acquisition is a core topic in cognitive science and has been a key test case for formal approaches. Topics include: learnability theory, grammatical approaches, connectionist models, and probabilistic models.

PSYCH 204. Computation and cognition: the probabilistic approach. 3 Units.

This course will introduce the probabilistic approach to cognitive science, in which learning and reasoning are understood as inference in complex probabilistic models. Examples will be drawn from areas including concept learning, causal reasoning, social cognition, and language understanding. Formal modeling ideas and techniques will be discussed in concert with relevant empirical phenomena.

Same as: CS 428

PSYCH 204A. Human Neuroimaging Methods. 3 Units.

This course introduces the student to human neuroimaging using magnetic resonance scanners. The course is a mixture of lectures and hands-on software tutorials. The course begins by introducing basic MR principles. Then various MR measurement modalities are described, including several types of structural and functional imaging methods. Finally algorithms for analyzing and visualizing the various types of neuroimaging data are explained, including anatomical images, functional data, diffusion imaging (e.g., DTI) and magnetization transfer. Emphasis is on explaining software methods used for interpreting these types of data.

PSYCH 204B. Human Neuroimaging Methods. 3 Units.

This course introduces the student to human neuroimaging using magnetic resonance scanners. The course is a mixture of lectures and hands-on software tutorials. The course begins by introducing basic MR principles. Then various MR measurement modalities are described, including several types of structural and functional imaging methods. Finally algorithms for analyzing and visualizing the various types of neuroimaging data are explained, including anatomical images, functional data, diffusion imaging (e.g., DTI) and magnetization transfer. Emphasis is on explaining software methods used for interpreting these types of data. nRequired: Psych 204a; Recommended: Cognitive Neuroscience.

PSYCH 205. Foundations of Cognition. 1-3 Unit.

Topics: attention, memory, language, similarity and analogy, categories and concepts, learning, reasoning, and decision making. Emphasis is on processes that underlie the capacity to think and how these are implemented in the brain and modeled computationally. The nature of mental representations, language and thought, modular versus general purpose design, learning versus nativism. Prerequisite: 207 or consent of instructor. nOpen to Psychology PhD students only.

PSYCH 206. Cortical Plasticity: Perception and Memory. 1-3 Unit.

Seminar. Topics related to cortical plasticity in perceptual and memory systems including neural bases of implicitly memory, recognition memory, visual priming, and perceptual learning. Emphasis is on recent research with an interdisciplinary scope, including theory, behavioral findings, neural mechanisms, and computational models. May be repeated for credit. Recommended: 30, 45.

PSYCH 207. Professional Seminar for First-Year Ph.D. Graduate Students. 2-3 Units.

Required of and limited to first-year Ph.D. students in Psychology. Major issues in contemporary psychology with historical backgrounds.

PSYCH 207B. Professional Development Seminar in Psychology. 0-1 Units.

For graduate students who wish to gain professional development skills to pursue an academic career. May be repeated for credit. Course is intended for second year Ph.D. student in Psychology but open to all years.

PSYCH 208. Advanced Topics in Self-Defense. 1-3 Unit.

Seminar. Threat to the self and how people deal with them. Readings from social psychological areas including social comparison, self-affirmation, self-completion, self-discrepancy, shame and guilt, terror management, dimensions of self-worth, self-regulation, self-presentation, psychophysiology, and moral identity. Enrollment limited to 15.

PSYCH 209. Neural Network Models of Cognition: Principles and Applications. 4 Units.

Neural Network models of cognitive and developmental processes and the neural basis of these processes, including contemporary deep learning models. Students learn about fundamental computational principles and classical as well as contemporary applications and carry out exercises in the first six weeks, then undertake projects during the last four weeks of the quarter. Recommended: computer programming ability, familiarity with differential equations, linear algebra, and probability theory, and one or more courses in cognition, cognitive development or cognitive/systems neuroscience.

PSYCH 211. Developmental Psychology. 1-3 Unit.

Prerequisite: 207 or consent of instructor.

PSYCH 212. Classic and contemporary social psychology research. 1-3 Unit.

Evolution of ideas from early experiments on group dynamics, attitude change, and cognitive dissonance to later work on behavioral and emotional attribution, and more contemporary work on strategies and shortcomings in judgment and decision-making and on implicit influences on attitudes and behavior. Other topics include social dilemmas, conflict and misunderstanding, positive psychology, and the application of social psychological principles and findings to ongoing social problems including social inequality, education, and the challenge of addressing climate change.

PSYCH 213. Affective Science. 3 Units.

This seminar is the core graduate course on affective science. We consider definitional issues, such as differences between emotion and mood, as well as issues related to the function of affect, such as the role affect plays in daily life. We review autonomic, neural, genetic, and expressive aspects of affective responding. Later in the course we discuss the role of affect in cognitive processing, specifically how affective states direct attention and influence memory, as well as the role of affect in decision making. We will also discuss emotion regulation and the strategic control of emotion; the cultural shaping of emotional experience and regulation; disorders of emotion; and developmental trajectories of experience and control from early to very late life. Meetings are discussion based. Attendance and active participation are required. Prerequisite: 207 or consent of instructor.

PSYCH 215. Mind, Culture, and Society. 3 Units.

Social psychology from the context of society and culture. The interdependence of psychological and sociocultural processes: how sociocultural factors shape psychological processes, and how psychological systems shape sociocultural systems. Theoretical developments to understand social issues, problems, and polity. Works of Baldwin, Mead, Asch, Lewin, Burner, and contemporary theory and empirical work on the interdependence of psychology and social context as constituted by gender, ethnicity, race, religion, and region of the country and the world. Prerequisite: 207 or consent of instructor.

PSYCH 216. Public Policy and Social Psychology: Implications and Applications. 4 Units.

Theories, insights, and concerns of social psychology relevant to how people perceive issues, events, and each other, and links between beliefs and individual and collective behavior will be discussed with reference to a range of public policy issues including education, public health, income and wealth inequalities, and climate change. Specific topics include: situationist and subjectivist traditions of applied and theoretical social psychology; social comparison, dissonance, and attribution theories; stereotyping and stereotype threat, and sources of intergroup conflict and misunderstanding; challenges to universality assumptions regarding human motivation, emotion, and perception of self and others; also the general problem of producing individual and collective changes in norms and behavior.

Same as: IPS 207B, PUBLPOL 305B

PSYCH 216A. Statistics and data analysis in MATLAB. 1-3 Unit.

This course will cover basic statistical principles that are widely n useful for the analysis of neuroscience and behavioral data, such as n error bars and confidence intervals, multivariate probability n distributions, regression and classification, linear and nonlinear n models, cross-validation, bootstrapping, and model selection. In each n class, we will cover the theory behind a statistical principle and n learn how to implement the principle efficiently in MATLAB. Example n material can be found at <http://randomanalyses.blogspot.com>. n Prerequisites: Familiarity with basic statistics and programming in MATLAB.

PSYCH 217. Topics and Methods Related to Culture and Emotion. 1-3 Unit.

Preference to graduate students. How cultural factors shape emotion and other feeling states. Empirical and ethnographic literature, theories, and research on culture and emotion. Applications to clinical, educational, and occupational settings. Research in psychology, anthropology, and sociology. May be repeated for credit.

PSYCH 218. Early Social Cognitive Development. 1-3 Unit.

Current literature on social and cognitive development in infancy emphasizing the interface between the two domains. May be repeated for credit. Prerequisite: consent of instructor.

PSYCH 220. Special Topics in Cognitive Development. 1-3 Unit.

In the last few years, research at the intersection of cognitive and social development has burgeoned, yielding unprecedented knowledge about the roots of the human (social) mind in infants and children. In this course, using an outstanding new volume edited by Susan Gelman and Mahzarin Banaji, we will discuss work that highlights the social nature of cognitive development (e.g., the degree to which social learning may account for uniquely human cognitive abilities) and that explores the early emergence of social knowledge and understanding (e.g., mental models of relationships, knowledge of good and bad, beliefs about ingroups and outgroups, and knowledge of other people's minds). Prerequisites: Psychology 207 or permission of instructor.

PSYCH 220S. Temptations and Self Control. 3 Units.

Why do people do things they come to regret, such as lack of exercise, angry words, overeating, unsafe sex, or dangerous driving? How can they minimize such behaviors? Sources include classical and current research from experimental psychology, neuroscience, behavioral economics, and neuroeconomics. Emphasis is on real-world applications.

PSYCH 221. Image Systems Engineering. 1-3 Unit.

This course is an introduction to digital imaging technologies. We focus on the principles of key elements of digital systems components; we show how to use simulation to predict how these components will work together in a complete image system simulation. The early lectures introduce the software environment and describe options for the course project. The following topics are covered and software tools are introduced: Basic principles of optics (Snell's Law, diffraction, adaptive optics). Image sensor and pixel designs Color science, metrics, and calibration Human spatial resolution Image processing principles Display technologies A special theme of this course is that it explains how imaging technologies accommodate the requirements of the human visual system. The course also explains how image systems simulations can be useful in neuroscience and industrial vision applications. The course consists of lectures, software tutorials, and a course project. Tutorials and projects include extensive software simulations of the imaging pipeline. Some background in mathematics (linear algebra) and programming (Matlab) is valuable. Prerequisite: EE 261 or equivalent. Or permission of instructor required.

PSYCH 222. From Classic Experiments to Cutting Edge Neuroimaging: The Functional Neuroanatomy of Visual Cortex. 1-3 Unit.

We will discuss the fundamental organizational principles of the visual system starting by discussing classic papers in non-human primates and proceeding to discuss recent neuroimaging studies in humans. We will then examine how understanding these organizational principles has influenced mapping the functional organization of visual system. Finally, we will analyze neuroimaging datasets and examine how well one can evaluate and define visual areas in the human brains by understanding these principles.

PSYCH 223. Social Norms. 3 Units.

This course covers research and theory on the origins and function of social norms. Topics include the estimation of public opinion, the function of norms as ideals and standards of judgment, and the impact of norms on collective and individual behavior. In addition to acquainting students with the various forms and functions of social norms the course will provide students with experience in identifying and formulating tractable research questions.

PSYCH 224. Research Topics in Emotion Regulation. 1 Unit.

Current research findings and methods, ongoing student research, and presentations by visiting students and faculty. May be repeated for credit. Prerequisite: consent of instructor.

PSYCH 225. Special Neuroscience Seminar with Dr. Shinobu Kitayama. 1-2 Unit.

How will culture influence the human mind? Is culture a superficial overlay on the basic, universal computational machine called the mind? Alternatively, is culture a crucial constitutive element of the mind? If so, what are specific mechanisms underlying this constitution process? And what theoretical framework do we need to make a visible progress on these questions? More generally, how can we start discussing meaningfully and productively about various problematic dichotomies such as mind versus body, culture versus biology, and nurture versus nature? An emerging field of cultural neuroscience has the potential of addressing these and other important questions and thus bridging natural, behavioral, and social sciences of the human mind. This seminar reviews the field of cultural neuroscience. It starts with a discussion of some theoretical foundations of the field, including cultural psychology, cognitive and social neuroscience, evolutionary psychology, and population genetics (PART 1). We will then discuss several specific content domains with a focus on cross-cultural variations in brain responses (PART 2). The seminar will conclude with a discussion on gene x environment interaction in varying cultural contexts (PART 3). Students can take the seminar for credit. One unit for attending all five sessions, two units for all five sessions and a short paper.

PSYCH 226. Models and Mechanisms of Memory. 1-3 Unit.

Current topics in memory as explored through computational models addressing experimental findings and physiological and behavioral investigations. Topics include: explicit and implicit learning; role of MTL structures in learning and memory; and single versus dual processes approaches to recognition. May be repeated for credit.

PSYCH 228. Ion Transport and Intracellular Messengers. 3 Units.

(Graduate students register for 228.) Ion channels, carriers, ion pumps, and their regulation by intracellular messengers in a variety of cell types. Recommended: 120, introductory course in biology or human biology. Same as: PSYCH 121

PSYCH 231. Questionnaire Design for Surveys and Laboratory Experiments: Social and Cognitive Perspectives. 4 Units.

The social and psychological processes involved in asking and answering questions via questionnaires for the social sciences; optimizing questionnaire design; open versus closed questions; rating versus ranking; rating scale length and point labeling; acquiescence response bias; don't-know response options; response choice order effects; question order effects; social desirability response bias; attitude and behavior recall; and introspective accounts of the causes of thoughts and actions.

Same as: COMM 339, POLISCI 421K

PSYCH 232. Brain and Decision Making. 3 Units.

Neuroeconomics combines experimental techniques from neuroscience, psychology, and experimental economics, such as electrophysiology, fMRI, eye tracking, and behavioral studies, and models from computational neuroscience and economics. May be repeated for credit. Prerequisite: consent of instructor.

PSYCH 233. MATLAB and Psychtoolbox for the Behavioral Sciences. 1-3 Unit.

Topics such as experiment design, stimulus presentation, counterbalancing, response collection, data analysis, and plotting. Programming experiments. Final project programming a complete behavioral experiment relevant to student's research.

PSYCH 234. Special Topics in Depression. 3 Units.

In this course we will discuss current issues in the study of major depression, including the epidemiology and phenomenology of depression and other affective disorders, psychological and biological theories of depression, gender differences in depression, cognitive and social functioning of depressed persons, findings from neuroimaging studies of depression, depression in children, risk factors for depression, issues involving suicide, and implications of the NIMH RDoC initiative for the study of depression and other psychiatric diagnostic categories. Prerequisite: graduate standing in Psychology or consent of instructor.

PSYCH 235. Motivation and Emotion. 3 Units.

This graduate seminar will take a social-cognitive perspective on motivation and emotion. Meetings will be discussion oriented, and each meeting will focus on a different question of theoretical and applied significance. Prerequisite: 207 or consent of instructor.

PSYCH 236C. Seminar in Semantics: Formal semantics and the psychology of reasoning. 2-4 Units.

Discussion of topics at the interface of natural language semantics and psychology of reasoning, such as conditionals, causal language, the language of uncertainty, generics, and syllogistic reasoning. Same as: LINGUIST 236

PSYCH 237. Mathematical Cognition. 2-4 Units.

The course will examine the basis of numerical and mathematical abilities, and the acquisition and learning of mathematical skills, drawing on experimental and modeling studies. Topics will include numerosity, counting, basic arithmetic, and fractions, as well as algebraic and geometric reasoning as well as insight into mathematical and scientific problems. Roles of rules, procedures and symbolic, spatial, and sensory-motor representations; relationship between skill and understanding; nature of discovery and insight in mathematical reasoning; the relationship between insight and proof. Open to PhD and Masters students and to Juniors and Seniors who have completed an introductory level course in cognitive or developmental psychology.

PSYCH 238. Wise Interventions. 4 Units.

Classic and contemporary psychological interventions; the role of psychological factors in social reforms for social problems involving healthcare, the workplace, education, intergroup, relations, and the law. Topics include theories of intervention, the role of laboratory research, evaluation, and social policy.

Same as: PSYCH 138, PUBLPOL 238

PSYCH 239. Formal and Computational Approaches in Psychology and Cognitive Science. 3 Units.

Do psychology and cognitive science need formal theories and/or explicit computational models? What insights should such things provide? What is the proper relationship between different theoretical and modeling approaches? Between different levels or kinds of analysis? Where do informally stated theories fit in and what are the roles of formal and computational modeling approaches in relation to other less explicitly specified forms of theorizing? This seminar will explore these issues and compare different formal and computational model variants, especially connectionist and probabilistic models, within 3-4 different target domains. Possible target domains include categorization, property induction, causal learning, perceptual decision making, language acquisition, semantics and pragmatics, and mid-level vision.

PSYCH 240. What Changes?. 3 Units.

When children get older, they start to behave differently. What's changing? In other words, what specific mechanisms underlie different developmental correlations between age and behavioral competence. Of course, the answer (or more likely, answers plural) to this question will differ vastly from domain to domain, but are there generalizations that we can make about the ways that different factors affect behavior across domains - differences in developmental drivers for so-called 'lower-level' tasks versus 'higher-level' tasks, or age-related differences in the determinants of change during specific time periods? In this course, we'll try to get a handle on some of the extant proposals on these questions, and maybe offer some of our own.

PSYCH 241. Probabilistic Models of Social Behavior and Affect. 4 Units.

How do we reason about other people and ourselves? Is human behavior in social situations a set of ad-hoc and irrational responses—or can we understand humans as making rational inferences under uncertainty about the people they are interacting with? This project-based seminar will re-examine classic findings from social psychology and affective science through the lens of rational analysis and probabilistic models. In collaboration with instructors, students will develop projects focused on making testable theoretical models of classic tasks and literatures with the goal of creating a publishable end product. Phenomena under consideration include but are not limited to: cognitive dissonance, attribution theory, mindset theory, stereotyping, and emotion perception.

PSYCH 243. General Development Seminar. 1-2 Unit.

May be repeated for credit. Prerequisite: consent of instructors. Restricted to Developmental graduate students.

PSYCH 244. Psychology of Aging. 1-3 Unit.

Theory and research in gerontology. Normal and abnormal changes that occur in biological, cognitive, and psychological aging. Emphasis is on the environmental factors that influence the aging process. Prerequisite: graduate standing in Psychology or consent of instructor.

PSYCH 245. Social Psychological Perspectives on Stereotyping and Prejudice. 3 Units.

Classic and contemporary social psychological approaches to prejudice and stereotyping. Emphasis is on how stereotypes are employed and maintained, and the influence of stereotyping and prejudice on behavior in domains including education, employment, politics, and law. Limited enrollment.

PSYCH 246. Cognitive and Neuroscience Friday Seminar. 1 Unit.

Participant presentations. May be repeated for credit. Prerequisite: graduate standing in psychology or neuroscience program.

PSYCH 247. Fundamentals of Neuroscience for Non-Life-Scientists. 2 Units.

Human behavior and the human brain and how it enables perception, learning, decision making, planning, and action with a focus on how neuroscience may be presented or used in law, business, or education contexts. Neurotechnology and experimental methods used to conduct research.

PSYCH 247A. Cognitive Science of Religion. 5 Units.

This seminar course will cover cognitive and evolutionary approaches to understanding religion. The class features cutting edge research on the cognitive science of religion from anthropology and psychology. Why is religious belief so powerful and resilient in human history? This course explores the new cognitive and evolutionary approaches to understanding religion that have recently attracted such widespread attention. Readings come from anthropology and psychology and include Boyd, Richerson, Henrich, Sperber, Barrett, McCauley, Boyer, Atran, Sosis, Norenzayan, Astuti, Harris, Legare and others. Same as: ANTHRO 359A

PSYCH 248. Advanced fMRI modeling and analysis. 3 Units.

This seminar will discuss the state of the art in methods for the modeling and analysis of functional magnetic resonance imaging data. Potential topics include connectivity modeling, causal modeling, multivariate pattern analysis, encoding models, and classification analysis. The seminar will include hands-on analysis exercises in addition to lectures.

PSYCH 248A. fMRI Analysis Bootcamp. 3 Units.

This course will provide a hands-on overview of methods for processing and analysis of functional magnetic resonance imaging data. Topics include preprocessing, statistical modeling, spatial normalization, statistical power analysis, multiple comparison correction, connectivity modeling, machine learning, and Bayesian modeling. The seminar will include hands-on analysis exercises in addition to lectures.

PSYCH 249. Human Motivation. 1-3 Unit.

Current research and theory including questions concerning the nature of human motives, intrinsic motivation, self-regulation, the roles of affect and cognition, and lifespan and cultural influences on motivation. Prerequisite: 207 or consent of instructors.

PSYCH 249L. Workshop on Language and Social Reasoning. 1 Unit.

To what extent can language use be treated as a special case of social cognition? The class will be based around visiting lectures by major researchers in this area, along with meetings to prepare for their visits by discussing key readings. May be repeated for credit.

Same as: LINGUIST 249L

PSYCH 250. High-level Vision: From Neurons to Deep Neural Networks. 3 Units.

Interdisciplinary seminar focusing on understanding how computations in the brain enable rapid and efficient object perception. Covers topics from multiple perspectives drawing on recent research in Psychology, Neuroscience, Computer Science and Applied Statistics. Emphasis on discussing recent empirical findings, methods and theoretical debates in the field. Topics include: theories of object perception, neural computations underlying invariant object perception, how visual exemplars and categories are represented in the brain, what information is present in distributed activations across neural populations and how it relates to object perception, what modern statistical and analytical tools there are for multi-variate analysis of brain activations.

PSYCH 251. Affective Neuroscience. 3 Units.

Theory and research. Comparative and human research approaches map affective function to neuroanatomical and neurochemical substrates. Prerequisite: consent of instructor.

PSYCH 252. Statistical Methods for Behavioral and Social Sciences. 1-6 Unit.

For students who seek experience and advanced training in empirical research. Analysis of data from experimental through factorial designs, randomized blocks, repeated measures; regression methods through multiple regression, model building, analysis of covariance; categorical data analysis through two-way tables. Integrated with the use of statistical computing packages. Prerequisite: 10 or equivalent.

PSYCH 253. Statistical Theory, Models, and Methodology. 3 Units.

Practical and theoretical advanced data analytic techniques such as loglinear models, signal detection, meta-analysis, logistic regression, reliability theory, and factor analysis. Prerequisite: 252 or EDUC 257.

PSYCH 254. Lab in Experimental Methods. 4 Units.

Laboratory class in experimental methods for psychology, with a focus on technical/computer-based methods. Programming experience helpful although not required. Topics include data collection on the web, data management and data analysis.

PSYCH 257. Individually Supervised Practicum. 3-5 Units.

Satisfies INS requirements for curricular practical training. Relevant experience for graduate students as part of their program of study. May be repeated for credit. Prerequisites: graduate standing in Psychology, consent of adviser.nn (Staff).

PSYCH 258. Graduate Seminar in Social Psychology Research. 1-3 Unit.

For students who are already or are planning to become involved in research on social construal and the role that it plays in a variety of phenomena, notably the origin and escalation of conflict.

PSYCH 259. Emotions: History, Theories, and Research. 1-3 Unit.

Graduate students register for 259. Theoretical and empirical issues in the domain of emotions. The history of emotion theories, current approaches, and the interaction between emotion and cognition.

Same as: PSYCH 158

PSYCH 261. Emotion. 3 Units.

(Graduate students register for 261.) The scientific study of emotion. Topics: models of emotion, emotion antecedents, emotional responses (facial, subjective, and physiological), functions of emotion, emotion regulation, individual differences, and health implications. Focus is on experimentally tractable ideas.

Same as: PSYCH 161

PSYCH 261A. Learning and Cognition in Activity. 3 Units.

Methods and results of research on learning, understanding, reasoning, problem solving, and remembering, as aspects of participation in social organized activity. Principles of coordination that support cognitive achievements and learning in activity settings in work and school environments.

Same as: EDUC 295

PSYCH 262. Language and Thought. 4 Units.

The psychology of language including: production and understanding in utterances; from speech sounds to speaker's meaning; children's acquisition of the first language; and the psychological basis for language systems. Language functions in natural contexts and their relation to the processes by which language is produced, understood, and acquired. Prerequisite: 1 or LINGUIST 1.

Same as: LINGUIST 131, PSYCH 131

PSYCH 263. Cognitive Neuroscience: Vision. 3 Units.

Decision, categorization. Bayesian inference, working memory, attention, cognitive control, conscious perception and awareness. The neural basis for all of these cognitive functions have been extensively studied in the domain of vision. Why vision? Because a great deal of scientific inquiry has delineated both the behavioral and physiological aspects of basic sensory processing in vision. Because of this, cognitive neuroscience questions can be precisely formulated in the context of vision. As a result we have some of the best answers to the question of what neural mechanisms underlie cognitive functions in the domain of vision.

The course will combine lectures and in-depth discussions of primary literature to develop key concepts in the neuroscience of vision and how these concepts have been built on to understand the neural basis of higher cognition. Guest instructors will include Bill Newsome, Tirin Moore and Kalanit Grill-Spector.

PSYCH 264. Moral Minds: What Can Moral Psychology Tell Us About Ethics. 2 Units.

SAME AS LAW744. Recent psychological advances in our understanding of the cognitive and social origins of morality cast a new light on age-old questions about ethics, such as: How did our moral sense evolve in our species? How does it develop over our lifetime? How much does our culture, religion, or politics determine our moral values? What is the role of intuition and emotion in moral judgment? How "logical" is moral judgment? How do other people's moral choices affect us? Does character matter or is behavior entirely dictated by the situations we find ourselves in? If it is purely situational, are we morally responsible for anything? How far will we go to convince ourselves that we are good and moral? Barbara Fried and Benoit Monin will review empirical answers to these questions suggested by behavioral research, and lead discussions on their implications for ethics. Students enrolled in the course will be selected through an application process. The application can be found at <http://web.stanford.edu/~arnewman/MoralMinds.fb>, and is due at 11:59 p.m. on November 14, 2014.

Same as: ETHICSOC 304

PSYCH 265. Social Psychology and Social Change. 2-3 Units.

The course is intended as an exploration of the major ideas, theories, and findings of social psychology and their applied status. Special attention will be given to historical issues, classic experiments, and seminal theories, and their implications for topics relevant to education. Contemporary research will also be discussed. Advanced undergraduates and graduate students from other disciplines are welcome, but priority for enrollment will be given to graduate students. In order to foster a vibrant, discussion-based class, enrollment will be capped at 20 students. Interested students should enroll in the class through simple enroll or access, and complete this survey (<https://tinyurl.com/SPSC17>) to be considered for admission to the course. Please contact the course TA, Michael Schwalbe ([schwalbe\[at\]stanford.edu](mailto:schwalbe[at]stanford.edu)), if you have any further questions.

Same as: EDUC 371

PSYCH 266. Current Debates in Learning and Memory. 1-3 Unit.

Memory is not a unitary faculty, but consists of multiple forms of learning and remembering. The cognitive and neural architectures of memory, focusing on the application of functional brain imaging (primarily fMRI and ERP). Psych 45 and Psych 169 required if undergraduate student.

PSYCH 267. Human Memory: Facts, Fallacies, and Fragile Powers. 1-3 Unit.

Seminar. Applications of memory concepts in everyday life and in social and clinical settings. Topics include personal identity, childhood amnesia, autobiographic memory, emotions and memory, memory distortions, illusions, self-serving biases, recovery of repressed memories, false memories, implicit memories, and unconscious influences on social behavior, with applications to psychopathology.

PSYCH 268. Emotion Regulation. 3 Units.

(Graduate students register for 268.) The scientific study of emotion regulation. Topics: historical antecedents, conceptual foundations, autonomic and neural bases, individual differences, developmental and cultural aspects, implications for psychological and physical health. Focus is on experimentally tractable ideas.

Same as: PSYCH 168

PSYCH 269. Graduate Seminar in Affective Science. 1 Unit.

May be repeated for credit. Prerequisite: graduate standing in Psychology. (Gotlib).

PSYCH 270. The Self: Representations and Interventions. 3 Units.

We will examine research and theory on mental models of the self, others, and the social world; how these develop; and how interventions can alter or leverage these mental models to improve human functioning and outcomes.

PSYCH 271. Writing About Psychology. 3 Units.

Writing clear and compelling prose is a vital skill for any psychologist, but one that is often not formally taught. This graduate seminar will provide a chance for students to think systematically about writing for audiences within and outside of psychology, and to concretely improve pieces of writing that matter to them. The course will take the form of a "writer's workshop", in which each student will bring two pieces of writing, one empirical, and one intended for a popular audience, to be discussed by the class. All class members will discuss each piece of writing twice, providing constructive feedback for the target student to revise her or his work. The workshop will be supplemented by general discussions of writing principles and examples of good writing in psychology.

PSYCH 272. Special Topics in Psycholinguistics. 1-3 Unit.

May be repeated for credit. Prerequisite: consent of instructor.

PSYCH 273. Graduate Seminar on Language, Cognition, and Perception. 3 Units.

Current topics and debates. Readings from psychology, linguistics, neuroscience, ethology, anthropology, and philosophy. May be repeated for credit.

PSYCH 274. Graduate Research Workshop on Psychological Interventions. 3 Units.

Psychological research has the potential to create novel interventions that promote the public good. This workshop will expose students to psychologically 'wise' intervention research and to support their efforts to conduct such interventions, especially in the context of education, broadly conceived, as well as other areas. The first part of the class will address classic interventions and important topics in intervention research, including effective delivery mechanisms, sensitive behavioral outcomes, the role of theory and psychological process, and considerations of the role of time and of mechanisms that can sustain treatment effects over time. In the second part of the class, students will present and receive feedback on their own ongoing and/or future intervention research. Prerequisite: Graduate standing in Psychology or Education, or consent of instructor.

Same as: EDUC 287

PSYCH 275. Graduate Research. 1-15 Unit.

Intermediate-level research undertaken with members of departmental faculty. Prerequisite: consent of instructor.nn (Staff).

PSYCH 277. Psychology of Pedagogy. 1-3 Unit.

How can methods and insights from psychology inform education practice, particularly in a higher education context? This course aims to develop your skills as critical consumers and producers of empirical findings on teaching and learning. Course involves a quarter-long project to develop a pedagogical research proposal, supplemented and informed by readings, guided discussions, and group workshops.

Same as: EDUC 248

PSYCH 278. Social Cognitive Development: New Methods for Answering Old Questions. 1-2 Unit.

Novel technology can fuel new discoveries and generate new questions for future research, for instance, the use of video cameras has transformed the field of developmental psychology. More recently, the use of neuroimaging techniques (such as fMRI) to study the developing brain has been gaining lots of interest among developmental psychologists. What are the promises and challenges of using these neuroimaging methods to study cognitive development? This course will be a discussion-based seminar class (with some lectures from the instructor and from students) aimed for graduate students who are interested in learning more about how these methods can help address questions about cognitive development, with a particular focus on children's developing understanding of their social world.

PSYCH 279. Topics in Cognitive Control. 1-3 Unit.

The processes that enable flexible behavior by biasing contextually relevant perceptual, mnemonic, and response representations or processing pathways. Cognitive control is central to volitional action, allowing work with memory, task/goal states, and overriding inappropriate responses. Current models of cognitive control, functional neuroimaging, and neuropsychological evidence. Recommended: 45. May be repeated for credit.

PSYCH 280. Foundations and Contemporary Topics in Social-Educational Psychology. 2-4 Units.

At its core, social psychology is concerned with educational problems because it addresses the problem of how to change hearts and minds in lasting ways. This course explores the major ideas, theories, and findings of social psychology, their educational implications, and the insights they shed into how and when people change. There will be a focus on educational issues. Intersections with other disciplines, in particular social development and biology, will be addressed. Historical tensions and traditions, as well as classic studies and theories, will be covered. Graduate students from other disciplines, and advanced undergraduates, are welcome (class size permitting).

Same as: EDUC 307

PSYCH 281. Practicum in Teaching. 1-5 Unit.

Enrollment limited to teaching assistants in selected Psychology courses. May be repeated for credit.

PSYCH 282. Practicum in Teaching PSYCH 1. 1-2 Unit.

Logistical TA training including: preparing for sections; creating, correcting exams; grading an iterative writing assignment; office hours; review sessions; developing audiovisual expertise; communicating via coursework. Review of student evaluations with instructor to set goals and strategies. Second quarter focuses on pedagogical improvement. Limited to current PSYCH 1 TAs. May be repeated for credit.

PSYCH 283. International Conflict Resolution Colloquium. 1 Unit.

(Same as LAW 611.) Sponsored by the Stanford Center on International Conflict and Negotiation (SCICN). Conflict, negotiation, and dispute resolution with emphasis on conflicts and disputes with an international dimension, including conflicts involving states, peoples, and political factions such as the Middle East and Northern Ireland. Guest speakers. Issues including international law, psychology, and political science, economics, anthropology, and criminology.

Same as: IPS 250A

PSYCH 283A. SPARQshop: Social Psychological Answers to Real-world Questions. 3 Units.

Undergraduate and graduate students will work in teams to design, build, test, and distribute online toolkits that help practitioners solve real-world problems by applying social science. Graduate students can build toolkits for their own research. Students will learn how to assess the needs of practitioner audiences; write text, design graphics, and program activities for these audiences; prepare, deliver, and produce a TED-style online video; design surveys in Qualtrics; and build and user-test the toolkit. Readings and class discussions will include modules on design thinking, storytelling, science writing, information design, and impact evaluation. For an example of a toolkit in progress, please visit spacereface.org. Permission of instructor required.

Same as: PSYCH 180A

PSYCH 284. Computational Modeling of a Range of Neural Circuits. 1-3 Unit.

Lectures, student presentations, and extensive software exercises. Focus on quantifiable models of neural signaling, starting with physical specification of input signals, sensory transductions, spiking, and mean electrical field potentials, and the inter-relation to BOLD signals (fMRI). Applications will be drawn from many examples, but a there will be a particular focus on the visual pathways and how measurements and models relate to visual perception.

PSYCH 285. Graduate Seminar on Theory of Mind. 3 Units.

Theory of Mind ζ the ability to reason and think about other minds ζ has been a topic of extensive research and heated debates in the past few decades. The course will provide an in-depth overview of the major theories that have motivated empirical research. Students will read and discuss theoretical papers as well as empirical work that have supported or refuted these theories, and the latest research on Theory of Mind, from various disciplines including (but not limited to), cognitive development, comparative psychology, and cognitive neuroscience.

PSYCH 287. Brain Machine Interfaces: Science, Technology, and Application. 1-3 Unit.

This course explores the current state of brain-machine interfaces: technologies that directly stimulate and/or record neural activity. Such interfaces are being used to treat nervous system disorders, including hearing, seeing, and motor dysfunction. We expect that the range of applications will expand over the next decade to other neurological conditions and to augmentation of function. The material we cover aims to explain some of the existing technology and to clarify its limitations and promise. The course organization is designed to develop new ideas and promote new collaborations for extending the reach of these technologies. The class will feature lecturers with expertise in brain-machine interfaces of various sorts or related technologies and methods, as well as directed readings and discussion about new work in the field. In the previous year lectures were given by: Brian Wandell, Daniel Palanker, Nikos Logothetis, John Oghalai, Stephen Baccus, Paul Nuyujukian, Dan Yoshor and Nick Melosh.

Same as: NSUR 287

PSYCH 288. Hierarchical Linear Modeling for Psychological Sciences. 1-3 Unit.

HLM is a statistical theory and a computer program used to analyze multi-level data, such as trials within participants or students within classrooms. HLM allows researchers to analyze data at each level of analysis separately, to partition the total variance across different levels, to explain variance at each level separately using level-appropriate predictors, and to model cross-level interactions. How to use the HLM program and to model various types of multi-level data using it. May be repeated for credit.

PSYCH 289. Sensory Representations in Language and Memory. 1-3 Unit.

Is recollecting an experience similar to re-experiencing it? How closely tied is our knowledge to the perceptual representations and processes that may have given rise to it? What role do perceptuo-motor representations play in understanding language? We will review the recent literature on perceptual re-activation in episodic memory, perceptual grounding in semantic representations, and neural reuse of perceptual mechanisms for abstract thought. Emphasis will be placed on recent research with an interdisciplinary scope, including discussion of theory, behavioral findings, neural mechanisms, and computational models. Prerequisite: Psych 207 or consent of instructor.

PSYCH 290. Graduate Research Methods. 2 Units.

Primary tool use for psychologists: basics of experiment design; computer-based experiments; web-based experiments; data analysis packages and data presentation; exploratory statistics; eye-tracking methods; psychophysiology methods; survey construction; corpus and discourse analysis; and perhaps hypnosis. Prerequisite: Ph.D. student in Psychology.

PSYCH 291. Psychology Teaching Methods. 1-2 Unit.

Open to graduate students and advanced undergraduates. Principles of good teaching. Students practice teaching skills.

PSYCH 292. Special Topics in Emotion Regulation. 1 Unit.

This seminar will consider special topics in emotion regulation. Admission is by invitation only.

PSYCH 293. Communication, Intentionality, and the Origins of Language. 3 Units.

How did language evolve to become a ubiquitous, definitional part of human life? What relationship does children's early language have to their understanding of intentionality and other methods of non-verbal communication? This seminar will survey theoretical and experimental work on the foundations of human language, communication, and intentionality, with the goal of understanding what we know and what questions are still open. Areas of focus include developmental work on communication; whether early language use is referential/intentional and whether early words are general or particular; and research on language evolution and animal communication.

PSYCH 294. Human Prosociality. 3 Units.

Human beings engage in a vast amount of prosocial behaviors (including altruism and cooperation) that critically support our success as a social species. That said, the psychological underpinnings of prosociality remain surprisingly enigmatic. This seminar will survey classic and modern theories of prosocial behavior from evolutionary biology, economics, psychology, and neuroscience, with an emphasis on common ideas about the cognitive and affective mechanisms supporting such behaviors. Students will be responsible for leading discussions and producing one in-depth review or research paper at the end of the quarter.

PSYCH 295. Cognitive Modeling using Bayesian Statistics. 2-3 Units.

This course introduces the student to cognitive modeling from a Bayesian statistical approach. The goal of the course is to facilitate and promote Bayesian fitting for a large variety of latent cognitive models to data through the use of accessible computer software. Within particular cognitive models, students will learn how to first construct a basic model, and then add various effects such as individual or group differences, substantive prior information, covariates, and contaminant processes. Along the way, students will gain a better understanding of the many advantages of Bayesian statistics over frequentist-type analyses. A strong statistical or computer science background is not required.

PSYCH 297. Seminar for Coterminial Master of Arts. 1-2 Unit.

Contemporary issues and student research. Student and faculty presentations.

PSYCH 298. Advanced Studies in Health Psychology. 3 Units.

This course provides an overview of the major concepts and questions in the field of health psychology. Through reading, lecture and interactive discussion, students have the opportunity to explore and think critically about a number of psychological and social influences in determining health including: emotions, beliefs, relationships, stress, motivation, behavior change, spirituality, culture, and social influence. Students will also discuss the role of important and current topics in the field of health psychology and medicine such as the changing role of the patient and provider relationship, health-care policy and the environment, placebo effects, wearable health devices, and the use of technology in medicine. Course is offered to graduate students and advanced undergraduates with permission from the instructor.

PSYCH 299. Temptations and Self Control. 2 Units.

(Graduate students register for 299.) Why do people do things that they come to regret? How can people minimize behavior such as exercise avoidance, angry words, overeating, unsafe sex, and dangerous driving? Sources include classical and current research from experimental psychology, neuroscience, behavioral economics, and neuroeconomics. Real-world applications. Same as: PSYCH 199

PSYCH 303. Human and Machine Hearing. 3 Units.

Topics: Linear and nonlinear system theory applied to sound and hearing; understanding how to model human hearing in the form of algorithms that can process general sounds efficiently; how to construct, display, and interpret "auditory images"; how to extract features compatible with machine-learning systems; how to build systems that extract information from sound to do a job; and example applications of machine hearing to speech, music, security and surveillance, personal sound diaries, smart house, etc. Prerequisites: basic calculus and algorithms.

PSYCH 373. Research Seminar: Mind, Brain, and Computation. 1 Unit.

Faculty and student research presentations focusing on work linking cellular, systems, cognitive, behavioral, and computational neuroscience. Limited to affiliates of the Center for Mind, Brain and Computation. May be repeated for credit.

PSYCH 383. International Conflict Resolution. 2 Units.

Same as LAW 5009; formerly Law 656) This seminar examines the challenges of managing and resolving intractable political and violent intergroup and international conflicts. Employing an interdisciplinary approach drawing on social psychology, political science, game theory, and international law, the course identifies various tactical, psychological, and structural barriers that can impede the achievement of efficient solutions to conflicts. We will explore a conceptual framework for conflict management and resolution that draws not only on theoretical insights, but also builds on historical examples and practical experience in the realm of conflict resolution. This approach examines the need for the parties to conflicts to address the following questions in order to have prospects of creating peaceful relationships: (1) how can the parties to conflict develop a vision of a mutually bearable shared future; (2) how can parties develop trust in the enemy; (3) how can each side be persuaded, as part of a negotiated settlement, to accept losses that it will find very painful; and (4) how do we overcome the perceptions of injustice that each side are likely to have towards any compromise solution? We will consider both particular conflicts, such as the Israeli-Palestinian conflict and the South African transition to majority rule, as well as cross-cutting issues, such as the role international legal rules play in facilitating or impeding conflict resolution, the intragroup dynamics that affect intergroup conflict resolution efforts, and the role of criminal accountability for atrocities following civil wars. Special Instructions: Section 01: Grades will be based on class participation, written assignments, and a final exam. Section 02: Up to five students, with consent of the instructor, will have the option to write an independent research paper for Research (R) credit in lieu of the written assignments and final exam for Section 01. After the term begins, students (max 5) accepted into the course can transfer from section (01) into section (02), which meets the R requirement, with consent of the instructor. Same as: IPS 250

PSYCH 459. Frontiers in Interdisciplinary Biosciences. 1 Unit.

Students register through their affiliated department; otherwise register for CHEMENG 459. For specialists and non-specialists. Sponsored by the Stanford BioX Program. Three seminars per quarter address scientific and technical themes related to interdisciplinary approaches in bioengineering, medicine, and the chemical, physical, and biological sciences. Leading investigators from Stanford and the world present breakthroughs and endeavors that cut across core disciplines. Pre-seminars introduce basic concepts and background for non-experts. Registered students attend all pre-seminars; others welcome. See <http://biox.stanford.edu/courses/459.html>. Recommended: basic mathematics, biology, chemistry, and physics. Same as: BIO 459, BIOC 459, BIOE 459, CHEM 459, CHEMENG 459

PSYCH 801. Master's TGR Project. 0 Units.

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PSYCH 802. PhD TGR Dissertation. 0 Units.

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