

PSYCHOLOGY

Courses offered by the Department of Psychology are listed under the subject code PSYCH on the (<http://explorecourses.stanford.edu/CourseSearch/search/?view=catalog&catalog=&page=0&q=PSYCH&filter-catalognumber-PSYCH=on>) Stanford Bulletin's (<http://explorecourses.stanford.edu/CourseSearch/search/?view=catalog&catalog=&page=0&q=PSYCH&filter-catalognumber-PSYCH=on>) ExploreCourses web site (<http://explorecourses.stanford.edu/CourseSearch/search/?view=catalog&catalog=&page=0&q=PSYCH&filter-catalognumber-PSYCH=on>).

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
- 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 master's program is available only to Ph.D. students in Psychology and, under special circumstances, students enrolled in other graduate programs offered through the University.

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 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 not 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 4 |
| 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 4 |
| PSYCH 75 | Introduction to Cultural Psychology 5 |
| PSYCH 80 | Introduction to Personality and Affective Science 3 |
| PSYCH 90 | INTRODUCTION TO CLINICAL PSYCHOLOGY: A NEUROSCIENCE PERSPECTIVE 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. 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.

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

The specialization tracks in Cognitive Sciences, Health and Development, Mind, Culture, and Society, and Neuroscience are retired as of 9/1/20. Students who had declared a track before 9/1/20 will be able to complete and graduate with the specialization track. Requirements for the specialization tracks can be found on the Psychology website.

Honors Program

The senior honors program is designed for exceptional 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.

Advising

Psychology supports a multiple mentorship model for advising majors. Within the department, students have the following advisers:

- Faculty major adviser
- Student services officer
- Peer advisers

Psychology Department advising is supplemented by support from Undergraduate Advising and Research Academic Advising Directors, the Residential Education dormitory staff, and many other potential advisers. We encourage our students to reach out to advisers from across the University to develop a robust support network.

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 not be used towards the Psychology minor.

The minor must include three of ten 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:

| | | 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: A NEUROSCIENCE PERSPECTIVE | |
| PSYCH 95 | Introduction to Abnormal Psychology | |

Elective Psychology 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.

Master of Arts in Psychology

Degree Eligibility

The Department of Psychology does not offer a terminal master's degree. Only currently enrolled Stanford doctoral students (Ph.D., M.D., or J.D.) are eligible to apply for the M.A. in Psychology.

Degree Requirements

- Completion of 45 units of graduate level Psychology courses
- A maximum of 18 units may be from lab courses, independent study, outside units, and practica (e.g., 222, 258, 269, 281, 297, 282, 290)
- Successful completion of the First Year Project (FYP) or equivalent master's thesis

Of the 45 units of Psychology courses, Master's students must complete 4 Core Courses and 2 Statistical Methods Courses as outlined below. These are the same Core Course and Quantitative Methods Course requirements that the Department sets for the Ph.D. students.

Core Course Requirement

Students are required to take four core courses, each course from a different area of the Psychology department: Affective Science, Cognitive Science, Developmental Psychology, Neuroscience, and Social Psychology, as listed below. All core courses must be taken for a letter grade, for 3 units, and passed with a grade of 'B-' or better.

Consistent with the program's goal of fostering breadth and engagement across all areas of the department, students are encouraged to take all five core courses spanning the five areas of the department. If a student takes five core courses, the units and grade of the fifth course are counted towards the student's advanced units.

| | | Units |
|-----------|--------------------------|-------|
| PSYCH 202 | Cognitive Neuroscience | 3 |
| PSYCH 205 | Foundations of Cognition | 3 |

| | | |
|--------------|---|-----|
| PSYCH 211 | Developmental Psychology | 3 |
| PSYCH 212 | Classic and contemporary social psychology research | 1-3 |
| or PSYCH 215 | Mind, Culture, and Society | |
| PSYCH 213 | Affective Science | 3 |

Students may be required by their advisors to take up to two additional graduate courses in their area of specialization. In these cases, the additional courses are counted towards the advanced units requirement as described below. Students should consult with their advisor about any additional requirements in their area of specialization.

Quantitative Methods Course Requirement

Students are required to take two of the following Quantitative Methods courses:

| | | Units |
|-----------|--|-------|
| PSYCH 251 | Experimental Methods | 3 |
| PSYCH 252 | Statistical Methods for Behavioral and Social Sciences | 5 |
| PSYCH 253 | Advanced Statistical Modeling | 3 |

Quantitative methods courses must be taken for a letter grade and passed with a grade of 'B-' or better.

Policy and Process for Current Psychology Ph.D. students

Graduate students who are already enrolled in the Psychology Ph.D. program and 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 Manager.

Students who are currently enrolled in a Stanford Ph.D. or professional program in another Department may be granted a Master of Arts in Psychology. In such cases, admission to the M.A. is considered by the faculty on a case-by-case basis. An admitted student must complete at least 45 units of Psychology courses and possibly other research or course requirements as determined by the faculty. Interested applicants should consult with the Student Services Manager, Emily Fay (ecfay@stanford.edu).

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.

Please note: The Department of Psychology does not offer terminal M.A. degrees for students who are not already pursuing another advanced degree at Stanford.

How to apply for the Psychology M.A.: Current Psychology Ph.D. Students

1. Fill out the application form and obtain your advisor's signature.
2. Submit the completed application form to the Psychology Student Services Manager, who will obtain the Department Chair's signature.
3. Submit a request for the Master's Degree via Axxess. In the Student Center tab, select "Petitions and Forms."
4. Enter your payment and select "Apply to Graduate" in Axxess (make sure to select the Master's, not Ph.D.).
5. Psychology's Student Services Office will approve your request in Axxess.

Policy and Procedures for External Students Requesting to Pursue a Master of Arts in Psychology

Graduate students from other Stanford departments/graduate programs may choose to request the opportunity to pursue a Master's of Arts in Psychology. They are eligible if:

- They are Ph.D., JD, or MD students in another Stanford department/graduate program AND
- They have secured a Psychology faculty sponsor who agrees to serve as their Master's research advisor.

Requirements

The requirements for the M.A. are the same for internal (Psychology Ph.D. program) and external (non-Psychology Ph.D. program) students. However, for external students, the M.A. coursework and thesis must be in addition to the coursework and milestone documents they are using towards their primary Ph.D. In other words, a student may not use the same course to count towards the unit or content requirements of both degrees; the student must choose which courses count for which degree. Note that students are still bound to the Ph.D. course load cap of 10 units per quarter. Students may count the Psych M.A. course units towards the requirement to complete 135 units in residence for a Ph.D. (a University requirement), but not towards specific Department/program-level Ph.D. requirements.

If a student requests permission to waive a particular core or methods course requirement (e.g., PSYCH 252) due to overlapping course content with their Ph.D. coursework, the student must petition the Psychology Graduate Program Committee. If this petition is granted, the student must still complete 45 units of Psychology coursework, of which a maximum of 18 can be labs/practica/research units. Waiving a course requirement simply means the student replaces the waived course with a different psychology course.

An external student's Master's Thesis cannot overlap with any similar milestone documents that count towards their primary Ph.D. For an external student, a successful Master's Thesis is a report on a research project in Psychology that is done during the first two years of their Master's studies. Typically, the thesis is written in the format of a scientific paper including the following sections (i) an introduction describing the background and theoretical context, (ii) a methods section describing the experimental paradigm, (iii) results detailing experiment outcomes with the appropriate data analyses, statistical analyses, figures, and/or tables, (iv) discussion, and (v) references. Both the primary advisor in the Psychology department and a second reader (must be a Stanford Academic Council member) will read and give the student feedback on their Master's Thesis, and the student must pass a 1-hour thesis defense at which the work is presented to the advisor and reader.

Process

A successful external M.A. recipient goes through the following steps:

1. The potential student secures a Psychology faculty research mentor who supports the addition of the M.A.; have an initial meeting with the Student Services Manager to review the program and set expectations.
2. The potential student submits an application to the Student Services Manager. This application is composed of the following materials: Statement of Purpose, CV, Letter of support from primary advisor(s) in home department
3. The Student Service Manager collates the application and submits to the area faculty for review.
4. If the area faculty approve, the Student Services Manager confirms Department approval with the student and records the student's commitment to pursue a M.A. Note: the student does not formally add the Psych M.A. program plan in Axxess at this time.

5. The student pursues the M.A. coursework and research under the consultation of the M.A. advisor. The Student Services Manager is available for logistical advising.
6. The student completes the coursework and submits a M.A. Thesis. The Thesis is submitted via email to the Psychology M.A. advisor and secondary reader, cc'ing the Psychology Student Services Manager.
7. The M.A. Thesis is defended in a presentation to the primary advisor and second reader, and the Thesis is reviewed and approved by both the primary advisor in the Psychology and the second reader.
8. The student submits the M.A. form, formally matriculates, and the M.A. degree is available in the system for the student to confer.

As with internal M.A. students, external M.A. students matriculate into the M.A. at the end of the program. This ensures that if a student opts not to complete the M.A., we do not need to process a formal withdrawal or dismissal from the M.A. program.

Funding

The Department does not provide funding for external M.A. students. If a faculty mentor wishes to engage an external M.A. student as an RA, the faculty must provide the funds.

Doctor of Philosophy in Psychology

There are no specific course requirements for admission to the doctoral program. Nevertheless, an applicant should have prior research experience, as well as the equivalent of a bachelor's degree. The Department of Psychology does not require the GRE for admission. The major focus of the doctoral program is on research training, and admission is highly selective.

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.

The Doctoral Training Program

A student typically concentrates in one of several areas within Psychology. Across all areas, the training program emphasizes the development of research competence, and students are encouraged to develop 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 theoretical, empirical, computational, and methods information. A number of courses and seminars are provided to assist in this learning, and students are expected to construct a program in consultation with their advisor(s) to obtain 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 first-hand knowledge of, and practical experience with, the methods of psychological investigation and study. Therefore, students are expected to spend half of their time on research and to take no more than 10 units of course work per quarter, beginning in the first quarter.

Students achieve competence in unique ways and at different rates. Students and advisors work together to plan a program leading to the objectives discussed above. For further information, contact the student services manager and refer to the Department Graduate Guide available on the Psychology Department web site (<https://psychology.stanford.edu/academics/phd-program/>).

Courses

Ideals

The Stanford Psychology Department values a shared appreciation of the full range of approaches and research questions spanned by the five areas of the department. The department seeks to train scientists who are well prepared to pursue careers that build on their training in any one of these areas and who can interact with researchers in other fields of Psychology. Therefore, students within each area of the department are expected to construct a program of study in consultation with their primary advisor that includes exposure to other areas in the department while also achieving sufficient depth within their own area of specialization to prepare them for their next career stage after graduating.

Requirements

Professional Seminar Requirement

During the first quarter of graduate study, students are required to take PSYCH 207 Professional Seminar for First-Year Ph.D. Graduate Students.

Core Course Requirement

Students are required to take four core courses, each course from a different area of the Psychology department: Affective Science, Cognitive Science, Developmental Psychology, Neuroscience, and Social Psychology, as listed below. All core courses must be taken for a letter grade, for 3 units, and passed with a grade of 'B-' or better. Students are expected to complete four core courses by the end of the third year.

Consistent with the program's goal of fostering breadth and engagement across all areas of the department, students are encouraged to take all five core courses spanning the five areas of the department. If a student takes five core courses, the units and grade of the fifth course are counted towards the student's advanced units.

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

Students may be required by their advisors to take up to two additional graduate courses in their area of specialization. In these cases, the additional courses are counted towards the advanced units requirement as described below. Students should consult with their advisor about any additional requirements in their area of specialization.

Quantitative Methods Course Requirement

Students are required to take two of the following Quantitative Methods courses:

| | | Units |
|-----------|--|-------|
| PSYCH 251 | Experimental Methods | 3 |
| PSYCH 252 | Statistical Methods for Behavioral and Social Sciences | 5 |
| PSYCH 253 | Advanced Statistical Modeling | 3 |

At least one of these courses must be taken in the first year, and both should be completed by the end of the second year. Quantitative methods courses must be taken for a letter grade and passed with a grade of 'B-' or better.

In the case that a student has already taken similar graduate-level coursework, with the consent of the advisor, the student may petition to substitute an alternative course for one of the two required courses; for example, to take 252 and 253 but not 251, or to take 251 and another

upper-division statistics course. Petitions must be submitted to the department's student services office and approved by the department's Director of Graduate Studies (DGS).

Students who did not take an undergraduate course in statistics should take PSYCH 10 (STATS 60) in the earliest possible quarter within the first year; this is a prerequisite to any graduate statistics course.

Advanced Units or Ph.D. Minor Requirement

Students must complete 12 units of advanced graduate course work, referred to as advanced units (AU). Students earn AU by taking: (a) non-core graduate psychology courses; and/or, (b) graduate-level courses in other departments comparable in quality to graduate courses offered by the Psychology Department. If there is any question about comparability of courses, the student should consult the advisor, student services, and, in some cases, the graduate program committee chair before taking the course.

Courses taken for a letter grade must receive a grade of 'B-' or better to count towards the advanced units requirement. Students may request to count up to 3 units of undergraduate-level coursework towards the AU requirement. The advisor should support the request and the undergraduate course must be substantive and relevant to the student's graduate research. Requests to count undergraduate-level coursework must be submitted to the student services manager and may be adjudicated by the Director of Graduate Studies and/or the Graduate Program Committee.

A student may choose to complete a Ph.D. minor in another department in lieu of the advanced units requirement. Students who choose to pursue a minor should register this decision with the student services manager.

Advanced units and/or Ph.D. minors must be completed by the end of fourth year. It is the department's expectation that all decisions related to the AUs or the Ph.D. minor are made in close consultation with the student's advisor.

Research

Ideals

The goals of the graduate program in the Stanford Psychology Department are twofold. First, it aims to develop researchers who are expert scholars in the area of their dissertation. The program expects graduates to be fluent in theoretical foundations and debates, empirical findings, and methods of their respective fields. Second, it aims to guide and foster students' development of an original research program that significantly advances knowledge in their field of specialization. Therefore, the research requirements, implemented in a series of milestones, are intended to help students obtain the necessary research experience, receive expert and constructive feedback from their primary advisor(s) and their committee, and ensure successful completion of their dissertation research at the end of the program.

Requirements

Students are expected to spend at least half of their time engaged 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.

First Year Project (FYP)

At the end of their first year of graduate study, students must submit a written report of their first-year research activities, called the First Year Project (FYP). This report should resemble a journal article in their area. It is written in consultation with their advisor. The FYP proposal is due at the end of Autumn Quarter. The final FYP is due on June 1 of the first year. First-year students must also work with their advisor to identify a second FYP reader (another Psychology faculty member) by the end of October in Autumn Quarter of the first year. Both the advisor and the second FYP reader are expected to read the FYP and provide the student

with constructive feedback. It is recommended that students meet with their FYP readers in the summer of the first year to receive feedback.

Dissertation Reading Committee

Students are expected to form a research committee, which must include the dissertation reading committee, before initiating their dissertation research. The research committee includes the dissertation advisor and at least two additional faculty members, for a total of three 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.

Students are required to form the committee and submit the Dissertation Reading Committee form to the student services manager by February 1 of third year.

Third Year Committee Meeting and Research Plan

Students are required to meet with their committee annually beginning in their third year. For the annual committee meetings, if a member of the student's regular committee is unavailable (e.g., on sabbatical), the student should recruit another member of the department faculty to attend instead.

In the third year, students are required to meet with their committee in Winter or Spring Quarter, no later than June 1. At least two weeks prior to this meeting, students must submit a 1-2 page research plan to the committee.

Research Plan

The third-year research plan, which is submitted to the committee, is a short (1-2 page) document containing a brief overview of the experiments that have been completed and the planned experiments. The research plan is due in Winter or Spring Quarter of the third year and no later than two weeks before the committee meeting.

Third-Year Committee Meeting

The goal of the third-year committee meeting is for students to present their planned research and preliminary data, as well as for the faculty to give students feedback on their research plan, feasibility, and progress. During the third-year committee meeting, students present and discuss with the committee:

- Background and hypothesis being tested
- Experiments and methods
- Preliminary results
- Potential outcomes as well as pitfalls

After the committee meeting, students should submit the research plan to the student services manager and report the date that the committee meeting took place.

Fourth-Year Committee Meeting and Research Plan

In the fourth year, students are required to meet with their committee in the Autumn or Winter Quarter. At least two weeks before the meeting, they must submit their Area Review and Research Roadmap (ARRR) to their committee.

Area Review and Research Roadmap (ARRR):

This document has two parts:

1. *Area Review*: A manuscript written in a format of a review paper that summarizes current theories, debates, and empirical work in the area of the dissertation, which ultimately leads to the open questions that will be answered in the dissertation. The goal of writing this document is to enable the students to organize and develop scholarly knowledge relevant to their dissertation research. This document could serve as the basis for the introduction to the dissertation and/or a basis for a review paper. The department expects that this

section will be the bulk of the ARRR. It expects students to consult with their advisor on the scope of this document, and to receive feedback from their committee during the fourth-year meeting.

2. *Research Roadmap*: This section is short (1-2 pages) and contains a brief overview of the experiments that will be part of the dissertation. Given that this document is written during the fourth year, it is expected that some of the experiments have been completed, while others are planned/ongoing.

Fourth-Year Committee Meeting

The goal of the fourth-year committee meeting is for students to present their research progress and receive feedback from the committee members on the ARRR. The department expects the presentation to start with a review of the relevant work, but focus on the research progress. During the meeting, students present and discuss with the committee:

- Background and hypothesis being tested
- Experiments and methods
- Current Results
- Planned experiments towards dissertation completion

After the committee meeting, students should submit the ARRR to the student services manager and report the date that the committee meeting took place.

Note: students who were admitted prior to 2018-19 may choose to use the prior milestone documents (the Dissertation Proposal and Conceptual Analysis of Dissertation Area) instead of the ARRR. This decision should be registered with the student services manager. Refer to the Stanford Bulletin from your entering year for details about these prior requirements.

Fifth-Year Committee Meeting and Beyond

The department expects that students complete their Oral Exam by the end of the fifth year. Thus, typically the Oral Exam replaces the fifth-year committee meeting. However, if a student defers the Oral Exam, the student is expected to meet with his/her committee before June 1 of the fifth year to give an update on ongoing research progress and receive feedback. The same applies for sixth year, and so on. After each committee meeting, students should report to the student services manager the date on which the committee meeting took place.

Oral Examination

In the Department of Psychology, the Oral Examination takes the form of a dissertation defense. A 5-member committee is formed to review the oral examination. This committee includes 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 45-minute public presentation to the department of the completed dissertation research, followed by a 10-15 minute period of open questions and answers. Parents and friends are welcome to attend. Following the presentation, the student and the committee convene for a closed part of the oral exam in which each of the committee members asks the Ph.D. candidate questions regarding his/her Ph.D. research. After the closed session, the candidate leaves the room and the committee discusses the outcome of the exam and members anonymously vote whether the candidate passed the oral exam. The total duration of both parts of the oral examination should be less than 3 hours, per University policy.

Dissertation

Per University policy, the candidate must complete a dissertation satisfactory to the dissertation reading committee. Typically, the candidate will submit the dissertation to the reading committee 2 weeks prior to the oral examination. Minor revisions to formatting may be made after the oral examination. It is allowable by University policy to have a single additional writing quarter after the defense to finalize the

dissertation. The dissertation must be approved and signed by each member of the dissertation reading committee.

Students must complete their oral examination and submit their dissertation before their candidate status expires at the end of the 7th year (per University policy, candidacy status is granted at the end of year 2, and students have 5 years of candidacy in which to complete all requirements). See the "Graduate Degrees (<http://www.stanford.edu/dept/registrar/bulletin/4901.htm>)" section of this bulletin for more information. The Department will review petitions for a longer candidacy period on a case-by-case basis.

Teaching Requirement

The department views experience in supervised teaching as an integral part of its graduate program. Regardless of the source of their financial support, all students spend are required to participate in at least 5 quarters of teaching experience during their graduate study.

Of these 5 teaching quarters, students are required to apply for 2 of the quarters providing teaching support to a service course, either 2 quarters of PSYCH 1 Introduction to Psychology or 2 quarters of a core statistics course: PSYCH 10 Introduction to Statistical Methods: Precalculus, PSYCH 251 Experimental Methods, PSYCH 252 Statistical Methods for Behavioral and Social Sciences, and/or PSYCH 253 Advanced Statistical Modeling. Students report if they prefer the PSYCH 1 path or the stats path (or neutral) in their first year.

| | | Units |
|--------------|--|-------|
| PSYCH 1 | Introduction to Psychology | 5 |
| PSYCH 10 | Introduction to Statistical Methods: Precalculus | 3-5 |
| or PSYCH 251 | Experimental Methods | |
| or PSYCH 252 | Statistical Methods for Behavioral and Social Sciences | |
| or PSYCH 253 | Advanced Statistical Modeling | |

Students are prohibited from teaching during the first year of graduate study. Students typically progress from closely supervised teaching to more independent teaching. Some students may be invited to offer a supervised, but essentially independent, seminar during their final year of graduate study.

Individual Development Plan

The Department of Psychology is committed to providing academic advising in support of graduate student scholarly and professional development. When most effective, the advising relationship entails collaborative and sustained engagement by both the advisor and the advisee. As a best practice, advising expectations should be periodically discussed and reviewed to ensure mutual understanding. Both the advisor and the advisee are expected to maintain professionalism and integrity.

In order to meet these advising goals, each student is required to complete an annual Individual Development Plan (IDP) and have at least one meeting with the advisor during the academic year to discuss the IDP. The purpose of the annual IDP meeting is to provide an opportunity to discuss the big picture of the student's progress over the past year as well as goals for the future. To help the IDP, prior to the meeting the student completes a form that promotes self-reflection and self-evaluation, and helps structure the discussion topics with the advisor. During the IDP meeting the student brings his or her current CV and discuss with the advisor current progress and future goals. During the meeting the student and their advisor develops an action plan for the subsequent year; both keep a copy of this plan.

For details about the IDP forms and process, please visit the Psychology Department website's Ph.D. Program Requirements page (<https://>

psychology.stanford.edu/academics/phd-program/phd-degree-requirements/#Individual%20Development%20Plan). The IDP meeting must take place before June 1 of each year. It is the student's responsibility to report when the meeting has occurred to the student services manager.

Student Evaluations

It is the department's policy for the full faculty to evaluate the progress of each graduate student at the end of Spring Quarter. Traditionally, this meeting is scheduled for the Thursday before Commencement, although this may vary slightly from year to year. The end-of-year evaluation is primarily based on three factors:

1. Quality of research
2. Performance in courses (especially required courses)
3. Recommendations of the advisor (including a commitment on the part of that advisor to continue in that role)

Students who are not making satisfactory progress may be dropped from the program within the policies set forth by the University Senate in the "Graduate Degrees (<http://www.stanford.edu/dept/registrar/bulletin/4901.htm>)" section of this bulletin.

Advancement to Candidacy

During this annual evaluation, second-year students are reviewed for advancement to candidacy. Per University policy, admission to candidacy for the doctoral degree is a judgment by the faculty in the department or school of the student's potential to successfully complete the requirements of the degree program. Further details about candidacy status can be found the "Graduate Degrees (<http://www.stanford.edu/dept/registrar/bulletin/4901.htm>)" section of this bulletin. By the end of the second year, students are expected to have completed the First Year Project, the required statistics courses, and several other courses from either the Core Course or Advanced Units requirement in order for the faculty to make a clear evaluation of their potential for candidacy.

When students are advanced to candidacy, the student must submit the application for candidacy form (signed by the advisor) to the Student Services Manager by September 1.

Ph.D. Minor in Psychology

Candidates for the Ph.D. degree in other departments may elect to take 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. Crosslisted graduate courses can be used to satisfy this requirement. All courses counting toward the Ph.D. minor must be taken for a letter grade and passed with a grade of 'B-' or better. If the course is not offered for a letter grade, it cannot be counted towards the Ph.D. minor.

COVID-19 Policies

On July 30, the Academic Senate adopted grading policies effective for all undergraduate and graduate programs, excepting the professional Graduate School of Business, School of Law, and the School of Medicine M.D. Program. For a complete list of those and other academic policies relating to the pandemic, see the "COVID-19 and Academic Continuity (<http://exploreddegrees.stanford.edu/covid-19-policy-changes/#tempdepttemplatetabtext>)" section of this bulletin.

The Senate decided that all undergraduate and graduate courses offered for a letter grade must also offer students the option of taking the course for a "credit" or "no credit" grade and recommended that deans, departments, and programs consider adopting local policies to count courses taken for a "credit" or "satisfactory" grade toward the fulfillment of degree-program requirements and/or alter program requirements as appropriate.

Undergraduate Degree Requirements

Grading

Psychology counts all courses taken in academic year 2020-21 with a grade of 'CR' (credit) or 'S' (satisfactory) towards satisfaction of undergraduate degree requirements that otherwise require a letter grade.

Graduate Degree Requirements

Grading

The department recognizes that the pandemic and remote research and instruction have generated unprecedented challenges for its students. Therefore, the faculty voted to implement temporary changes to the graduate program requirements for 2020-21 to afford students greater flexibility to navigate these challenging times.

Under the 2020-21 academic year policy:

- Graduate students will be able to enroll and take all classes for letter grade, CR/NC, or S/NC.
- This grading policy extends to the core and quantitative courses that, under normal program guidelines, require a letter grade of 'B-' or higher.
- An 'S' grade, a 'CR' grade, or a letter grade of 'C-' or higher on all core and quantitative courses will be counted towards fulfilling degree requirements.

These policy changes are in line with our program's mission and values. The collective view of the faculty is that the goal of the core and quantitative courses is to provide students with foundational knowledge that is important for their careers. In response to the COVID-19 pandemic, the department would like to underscore the formative nature of these courses and the student's learning, and simply take away the worry about the grades. This indicates the trust the faculty put in its students, that they will do what you came to do, i.e., learn the material and develop the skills needed to be key contributors to science and society. The department also encourages students to discuss with faculty advisors whether they should adapt their course load and/or research plan as the pandemic may have affected their personal circumstances.

Graduate Advising Expectations

The Department of Psychology is committed to providing academic advising in support of graduate student scholarly and professional development. When most effective, the advising relationship entails collaborative and sustained engagement by both the advisor and the advisee. As a best practice, advising expectations should be periodically discussed and reviewed to ensure mutual understanding. Both the advisor and the advisee are expected to maintain professionalism and integrity.

Faculty advisors guide students in key areas, such as selecting courses, designing and conducting research, writing results of research studies as manuscripts for peer-reviewed journals, developing teaching pedagogy, navigating policies and degree requirements, and exploring academic opportunities and professional pathways.

Graduate students are active contributors to the advising relationship, proactively seeking academic and professional guidance and taking responsibility for informing themselves of policies and degree requirements for their graduate program.

For a statement of University policy on graduate advising, see the "Graduate Advising (<http://exploreddegrees.stanford.edu/graduatedegrees/#advisingandcredentialstext>)" section of this bulletin.

Individual Development Plan (IDP)

In order to meet the advising goals described above, each PhD student is required to complete an annual Individual Development Plan (IDP) and have at least one meeting with their advisor during the academic year to discuss the IDP. The purpose of the annual IDP meeting is to provide an opportunity to discuss the big picture of the student's progress over the past year as well as goals for the future. To help the IDP, prior to the meeting the student completes a form that promotes self-reflection and self-evaluation, and helps structure the discussion topics with the advisor. During the IDP meeting the student brings his or her current CV and discuss with the advisor current progress and future goals. During the meeting the student and their advisor develops an action plan for the subsequent year; both keep a copy of this plan.

For details about the IDP forms and process, please visit the Psychology Department website's PhD Program Requirements page (<https://psychology.stanford.edu/academics/phd-program/phd-degree-requirements/#Individual%20Development%20Plan>). The IDP meeting must take place before June 1 of each year. It is the student's responsibility to report when the meeting has occurred to the student services manager.

Emeriti: (Professors) Albert Bandura, Herbert H. Clark, Anne Fernald, John H. Flavell, Leonard M. Horowitz, Mark R. Lepper, Roger N. Shepard, Claude M. Steele, Ewart A. C. Thomas, Barbara Tversky, Philip G. Zimbardo

Chair: Anthony D. Wagner

Director of Graduate Studies: Kalanit Grill-Spector

Director of Undergraduate Studies: Jeanne Tsai

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, Nilam Ram, Lee D. Ross, Jeanne L. Tsai, Anthony D. Wagner, Brian Wandell, Jeffrey J. Wine

Professor (Research): Anthony Norcia

Associate Professors: Michael C. Frank, Noah Goodman, Hyowon Gweon, Gregory M. Walton, Jamil Zaki

Associate Professor (Teaching): Catherine Heaney

Assistant Professors: Alia Crum, Justin Gardner, Steven Roberts, Daniel Yamins

Assistant Professor (Research): Johannes Eichstaedt

Lecturers: Parul Chandra, Todd Erickson, Amie Haas, Adrienne Lomangino, Jenna Valasek, Jennifer Winters, Beth Wise

Courtesy Professors: 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. Psych 1 fulfills the SI Way, and, effective Autumn 2018, the SMA Way. For more information on PSYCH 1, 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.

One of the most exciting transformations in the social sciences in recent years is the finding that brief psychological exercises can improve important outcomes for months and years such as raising school achievement and reducing inequality, improving health, and reducing intergroup conflict. These interventions help individuals flourish and help our society live up to its ideals. They address critical psychological questions people have, like "Do people like me belong in this school?", "Can I learn math?", "Am I bad mom?", and "Can groups in conflict change?". In this seminar, we will learn about "psychologically wise" interventions; how they work; how they can cause lasting benefits; their intellectual lineage; how they can be used, adapted, and scaled to address contemporary problems; and challenges and mistakes that can arise in doing so. In addition to learning from classic and contemporary research, you will design your very own wise intervention and workshop others' efforts. Working with a community partner, you will explore a problem your partner faces, identify a specific psychological process you think contributes to this problem, and design an intervention to address this process to improve outcomes, which your partner could implement and evaluate. You will share your approach in a final report with both your seminar-mates and your community partner. 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 8N. The New Longevity. 3 Units.

Life expectancy nearly doubled in the 20th century. Along with a decrease in fertility societies are also aging. These changes have ramifications for all of the fundamental structures that guide people through life, including work, education, and the nature of families, as well as health, social engagement, and fitness. This course focuses on the implications for young generations today that will likely live longer than any in human history.

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 11N. Belonging in a Diverse Society. 3 Units.

One of the most important questions people ask themselves when they enter a new setting, whether a school, a workplace, or a country, is "Do I belong here?". How do people make sense of their belonging in a new setting? How and why do group identities, such as race-ethnicity, social-class background, gender, or national origin matter? What are the consequences of people's inferences about their belonging? And how can we create school and work settings in which people from diverse backgrounds can genuinely and authentically belong?

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 15N. Becoming Kinder. 3 Units.

Kindness - the ability to understand each other, the instinct to care for each other, and the desire to help each other - is among our most powerful natural resources. It supports cooperation, fosters relationships, improves health, and overwrites hatred. Kindness is also challenging, especially in the modern world. More than ever, individuals are isolated, anonymous, and independent: qualities that make it harder to truly see each other and easier to succumb to indifference and even cruelty. As technology mediates more of our interactions and tribal signifiers occupy more of our identity, kindness erodes. And yet we have options. A growing number of social scientists are now experimenting in re-building kindness, using everything from virtual reality to meditation to literature to old-fashioned friendship. Their efforts demonstrate that through directed effort, people can become kinder. This class will explore the nature of kindness, the challenges modernity has placed in front of it, and the many ways scientists and practitioners are stimulating kindness. Though drawing mainly from psychology, we will tour sociology, conflict resolution, technology, the humanities, and neuroscience as well. The class will also grapple with central questions about human nature -most importantly, to what extent can we change ourselves into the people we'd like to become? Finally, we will meld science with personal narrative and exercises meant to not only explore kindness-building as a research concept, but as a part of our own lives.

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 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 21N. How to Make a Racist. 3 Units.

How does a child, born without beliefs or expectations about race, grow up to be racist? To address this complicated question, this seminar will introduce you to some of the psychological theories on the development of racial stereotyping, prejudice, and discrimination. Together, these theories highlight how cognitive, social, and motivational factors contribute to racist thinking. We will engage thoughtfully and critically with each topic through reflection and discussion. Occasionally, I will supplement the discussion and class activities with a brief lecture, in order to highlight the central issues, concepts, and relevant findings. We will share our own experiences, perspectives, and insights, and together, we will explore how racist thinking takes root. Come to class with an open mind, a willingness to be vulnerable, and a desire to learn from and with your peers. Students with diverse opinions and perspectives are encouraged to enroll.

Same as: AFRICAAM 121N, CSRE 21N

PSYCH 24N. Neuroforecasting. 3 Units.

Preference to freshmen. This course explores whether brain activity can be used not only to predict the choices of individuals, but also of separate groups of individuals in the future (e.g., in markets). Questions include how neuroforecasting is possible, whether it can add value to other forecasting tools (e.g., traditional measures like behavioral choice and subjective ratings), and when it extends to different aggregate scenarios. The course is ideal for students that would like to extend neural predictions about individual choice to group choice, and who plan to apply this knowledge in future research.

PSYCH 30. Introduction to Perception. 4 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 30N. The Science of Diverse Communities. 3 Units.

This course is an exploration. Most generally, its aim is to identify distinguishing features of good diverse communities and articulate them well enough to offer principles or guidelines for how to design and manage such communities - all with a particular focus on educational communities like schools, universities, academic disciplines, etc., but with the hope that such principles might generalize to other kinds of organizations and the broader society. The readings range from those on the origins of human communities and social identities to those on intergroup trust building. They also aim to embed our discussions in the major diversity issues of the day, or example, what's in the news about campus life. nnnThus the course has a practical purpose: to develop testable ideas for improving the comfort level, fairness and goodness-for-all of identity diverse communities—especially in educational settings. nnnThe course also has a basic science purpose: to explore the psychological significance of community. Is there a psychological need for community? Is there something about a need for community that can't be reduced to other needs, for example, for a gender, racial or sexual-orientation identity? How strong is the need for community against other needs? What kinds of human groupings can satisfy it? In meeting this need, can membership in one community substitute for membership in others? What do people need from communities in order to thrive in them? Do strong diverse communities dampen intergroup biases? Can strong community loyalty mitigate identity tensions within communities? nnnSuch questions, the hope is, will help us develop a more systematic understanding of the challenges and opportunities inherent in diverse human communities.

Same as: CSRE 30N, EDUC 30N, SOC 179N

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. Students must take this course before being approved to declare Symbolic Systems as a major. All students interested in studying Symbolic Systems are urged to take this course early in their student careers. The course material and presentation will be at an introductory level, without prerequisites. If you have any questions about the course, please email symsys1staff@gmail.com.

Same as: CS 24, LINGUIST 35, PHIL 99, SYMSYS 1, SYMSYS 200

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.

How does our brain give rise to our abilities to perceive, act and think? Survey of the basic facts, empirical evidence, theories and methods of study in cognitive neuroscience exploring how cognition is instantiated in neural activity. Representative topics include perceptual and motor processes, decision making, learning and memory, attention, reward processing, reinforcement learning, sensory inference and cognitive control.

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. 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.

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 your personality and emotions? These are questions we begin to address in this introductory course on personality and emotion. Prerequisite: Psych 1.

PSYCH 90. INTRODUCTION TO CLINICAL PSYCHOLOGY: A NEUROSCIENCE PERSPECTIVE. 3 Units.

This course will provide students with an overview of the field of clinical psychology, the various roles of clinical psychologists in research and practice, and implications of current research in neuroscience for clinical psychology. We will discuss the definition and history of clinical psychology as a profession, research methods used in clinical psychology, issues in diagnosis and classification of disorders, techniques used in the assessment of intellectual and personality functioning, various approaches to therapeutic intervention, and issues related to ethics, professionalism, and training in clinical psychology. Throughout this course we will review and integrate relevant research in the field of clinical neuroscience with our discussion and understanding of clinical psychology.

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. 3 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. NOTE: Please check the Notes section under each quarter to view the current enrollment survey.

Same as: CSRE 103

PSYCH 103F. Intergroup Communication Facilitation. 2 Units.

Are you interested in strengthening your skills as a facilitator or section leader? Interested in opening up dialogue around identity within your community or among friends? This course will provide you with facilitation tools and practice, but an equal part of the heart of this class will come from your own reflection on the particular strengths and challenges you may bring to facilitation and how to craft a personal style that works best for you. This reflection process is ongoing, for the instructors as well as the students.

Same as: CSRE 103F

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 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 110S. Introduction to Cultural Psychology. 3 Units.

In an increasingly globalized world, the ability to understand people from different cultural backgrounds, as well as understand how we are influenced by our own cultural contexts, is an essential skill. In this course, we will consider the many ways in which individuals shape, and are shaped by, institutions (e.g., education system; media; religion), social interactions (e.g., family; employers), and broad cultural ideas (e.g., democracy). Drawing from psychological research, we will analyze sociocultural sources of diversity in self, agency, cognition, emotion, motivation, development, and relationships. We will also analyze past and modern cultural products - including films, literature, music, and art - to better understand the transmission of culture. Each discussion will contribute to a better understanding of the hidden factors that guide daily experiences and the various opportunities and barriers to creating social change. The course will empower students to recognize and analyze the influence of culture on everyday functioning and apply that understanding to improving their own and other people's outcomes.

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. 3 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: COMPLIT 138, COMPLIT 238, ENGLISH 118, ENGLISH 218, FRENCH 118, FRENCH 218, PSYC 126

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 123F. Navigating a Multicultural World: Practical recommendations for individuals, groups, & institutions. 4 Units.

The world is becoming increasingly multicultural, as groups of different races, ethnicities, ages, genders, and socioeconomic classes are coming into closer and more frequent contact than ever before. With increased cultural contact comes the need to create spaces that are inclusive and culturally sensitive. In addition, individuals must learn to live, work, and communicate in a multicultural world. How can we leverage research from cultural psychology to promote the best possible individual, interpersonal, and institutional outcomes for all groups? This course will serve as an introduction on how to create multicultural worlds and individuals. Drawing heavily on research, this course begins with a review of what culture is and how it influences individual thoughts, emotions, and behaviors. We then discuss multiculturalism (e.g., what is it, what are some costs and benefits) before addressing how to promote optimal functioning in multicultural settings.

Same as: CSRE 123F

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 132. Language and Thought. 3 Units.

Languages vary tremendously in how they allow us to express ourselves. In some languages, you have to say when an event happened (past, present, future, etc.), while in others it is obligatory to say how you know about the event (you saw it, you heard about it), or what genders its participants were. In addition, languages just feel different from one another - some feel poetic while others feel brutal. Some things just don't sound right in certain languages, and some translations are harder than others to pull off. But are these differences meaningful? Do differences across languages cause substantive changes in the cognition of their speakers? We'll read some of the burgeoning research literature on these questions and consider how they can be answered with new empirical tools.

PSYCH 134S. Psychology of Close Relationships. 3 Units.

The purpose of this course is to provide an overview of theory and research on the psychology of interpersonal relationships from a social psychological perspective, with a particular focus on friendships and romantic relationships. The goals for the course are: 1) To familiarize students with the variables important to the social psychological study of interpersonal relationships, 2) To review the major theoretical foundations and current research, not only from social psychology but also from other disciplines (e.g., communication, personality psychology), and 3) To give students practice in reading empirical journal articles, writing, and oral presentation. The course will examine some of the theories and research related to the psychology of interpersonal relationships. Some of the topics this course will cover include: theoretical perspectives, research methods, culture, attraction, attachment, social cognition, communication, interdependence, friendship, love, stressors in relationships, relationship maintenance, conflict, and dissolution.

PSYCH 135. The Psychology of Diverse Community. 3 Units.

This course is an exploration. Its aim is to identify distinguishing features of good diverse communities and articulate them well enough to offer principles or guidelines for how to design and manage such communities e.g. schools, universities, academic disciplines, etc.

Same as: CSRE 135P

PSYCH 135S. Sex and Sexual Assault on College Campuses. 3 Units.

Students on college campuses are disproportionately at risk of sexual assault. One in every five women and one in twenty men will be sexually assaulted during their time in college. In this course, we will use a cultural psychological lens to analyze the ways in which institutions, ideas, and individuals interact to affect both sex and sexual assault. We will tie together differing research opinions about how sexual misconduct is normalized and perpetuated on college campuses, and examine the roles of Greek life, hookup culture, and party culture. We will take an intersectional approach as we deconstruct gender roles, look at sex and consent in straight and LGBTQIA+ communities, and examine how power impacts sex. Additionally, we will explore the effects of current political and social movements such as #MeToo on campus culture. This course will combine lectures and in class discussions with weekly reflections, where students will have a chance to connect what they are learning in class to their own lived experiences. Students will leave this course with a framework for approaching, analyzing, and changing both campus culture and their own relationships.

PSYCH 136. The Psychology of Scarcity: Its Implications for Psychological Functioning and Education. 3 Units.

This course brings together several literatures on the psychological, neurological, behavioral and learning impact of scarcities, especially those of money (poverty) time and food. It will identify the known psychological hallmarks of these scarcities and explore their implications for psychological functioning, well-being and education—as well as, how they can be dealt with by individuals and in education.

Same as: CSRE 136U, PSYCH 236A

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 137. Belonging in a Diverse Society. 3 Units.

One of the most important questions people ask themselves when they enter a new setting, whether a school, a workplace, or a country, is "Do I belong here?". How do people make sense of their belonging in a new setting? How and why do group identities, such as race-ethnicity, social-class background, gender, or national origin matter? What are the consequences of people's inferences about their belonging? And how can we create school and work settings in which people from diverse backgrounds can genuinely and authentically belong?.

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 139A. Psychology Beyond the Classroom. 1 Unit.

By its very nature psychology is interdisciplinary. This course will consist of student-led workshops for those who are interested in the role of psychology in today's society. Each week a different student will talk about an interest of theirs – anything from Disney movies to memes – and how it relates to psychology. Students are encouraged to be as creative as possible and take initiative! (Presented by the Stanford Undergraduate Psychology Association.).

PSYCH 139B. Psychology Beyond Undergrad. 1 Unit.

Ever wondered what graduate school in psychology could look like for you? In this workshop series, you'll get to hear from current graduate students and faculty about their experiences with graduate school. Come hear about what the pros and cons of going to graduate school are, how to navigate the application process, and more! Class will consist of biweekly panels and Q&A, and is aimed at undergraduate students of all class years. (Presented by the Stanford Undergraduate Psychology Association.).

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, LINGUIST 245A

PSYCH 140S. Do I Belong Here? How to Use Social Psychology to Build Belonging. 3 Units.

This course will provide students with a theoretical and applied understanding of the challenges, barriers, and solutions for how to cultivate belonging in educational and professional contexts from a social psychological perspective. The course will pull from core findings in social psychology, sociology, and organizational behavior to scaffold the student's holistic understanding of belonging. We will then highlight research such as intergroup relations, attribution ambiguity, and mindsets that illustrates the antecedents and consequences of threats to belonging. Finally, the course will demonstrate how we can utilize 'wise interventions' in real-world settings to foster belonging by creating change at the individual, institutional, and policy level. The course, overall, will attempt to educate students about how people understand themselves, their situations, and how they understand themselves in those situations, and equip them with data-driven strategies to build and create more inclusive and diverse spaces.

PSYCH 141. Cognitive Development. 3 Units.

How do humans think, learn, and communicate? What are the developmental roots of these capacities, and what makes young children such remarkable learners? 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 understand the logic behind the scientific methods for studying cognition in young children. By the end of the course, students will gain a deeper understanding of the major theoretical accounts of intellectual growth as well as the key empirical findings that support (or refute) these accounts, understand the basic logic of scientific methods in cognitive development research, and be able to discuss implications of cognitive development research on real-world issues in education and social policy. PSYCH141 is an Area A course for 2019-2020. Prerequisites: PSYCH 1. Recommended: PSYCH 60.

PSYCH 141S. The Psychology of Health: Culture, Self, and Society. 3 Units.

What is health? How does someone become healthy or maintain good health? In the US, mainstream narratives about health tend to focus on individual choices and behavior. In this course, we take a broader focus, examining how individual health is shaped by social interactions (e.g., with family, friends, doctors), institutions (e.g., media, policy, advertising), and broad cultural ideas and values (e.g., personal responsibility, independence). Drawing from psychological research, we will examine topics at the intersection of self and society, including: the role of stress, stigma and blame in shaping health and wellbeing, cultural processes contributing to health disparities, attitudes about the proper role of government in shaping public health, and the erosion of trust in medical authority (e.g. anti-vaccination attitudes). We will also consider how race, gender, and socioeconomic status impact health outcomes. Throughout the course, we will analyze cultural products including advertisements, media stories, health PSAs, and government statements to better understand the transmission of cultural ideas of health. Finally, we will discuss various opportunities and barriers to creating social and cultural change regarding health. The course will empower students learn to recognize and analyze the influence of culture on everyday functioning and apply that understanding to improving their own and other people's health outcomes.

PSYCH 142A. Special Topics in Adolescent Mental Health. 4 Units.

Includes the study of aspects of common disorders seen in adolescent populations, such as prevalence, developmental course, gender differences, theoretical explanations, and therapeutic interventions. Topics will include mood/anxiety disorders, eating disorders, learning disabilities and ADHD, sexual risk behaviors, developmental disorders, substance abuse, and self-harm. Goals of this course include getting students to think critically about the unique mental health needs of adolescents, collaborating on devising ways to improve the way our society meets those needs, and strengthening writing and communication skills applicable to this area of inquiry. Enrollment limited to students with sophomore academic standing or above. Prerequisites: Human Biology Core or Biology Foundations or equivalent or consent of instructor.

Same as: HUMBIO 142M

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 145A. Monitoring the Crisis. 4-5 Units.

A course devoted to understanding how people are faring as the country's health and economic crisis unfolds. The premise of the course is that, as important and valuable as surveys are, it's a capital mistake to presume that we know what needs to be asked and that fixed-response answers adequately convey the depth of what's happening. We introduce a new type of qualitative method that allows for discovery by capturing the voices of the people, learn what they're thinking and fearing, and understand the decisions they're making. Students are trained in immersive interviewing by completing actual interviews, coding and analyzing their field notes, and then writing reports describing what's happening across the country. These reports will be designed to find out who's hurting, why they're hurting, and how we can better respond to the crisis. Students interested should submit the following application: <https://docs.google.com/forms/d/e/1FAIpQLSfdOZsnpOCg4zTRbVny0ikxpZEd1AFEEJh3K9KjvINyfbWMGw/viewform> The course is open to students who have taken it in earlier quarters, with repeating students allowed to omit the training sessions and, in lieu of those sessions, complete additional field work and writing. Field work will include unique interviews with new participants each lab period, along with corresponding coding, analyses, and reports. Same as: PUBLPOL 141, SOC 141, SOC 241, URBANST 149

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 Units.

Learning about children through guided discussions and video analyses from Bing Nursery School. Together we will look into children's interactions with the world around them within the contexts of their physical, cognitive, social, and emotional development. We will also be examining their experiences in relation to research and theory. Note: Students will enroll in discussion sections through Canvas during the first week of class.

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 Units.

For children playing is more than just fun; it is essential for children's growth and wellbeing. Play is so important to optimal child development that it has been recognized by the United Nations High Commission for Human Rights as a right of every child. This course explores this connection between different types of play and children's development in four arenas: social, emotional, cognitive, and physical. In order to promote optimal learning and growth in children, it is important to recognize that these cognitive, physical, social, and emotional systems are intertwined. In this course students will not only learn about play, but also examine their own play experiences and histories. Using readings, recordings of children at play, videos, presentations, and reflections we will delve into the experience of play for children and ourselves. The course is rooted in the play experiences and philosophy of Bing Nursery School, a laboratory school at Stanford. For over 50 years it has been engaging children in play-based learning experiences.

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

What are emotions? What purpose do they serve? How do we measure them? Can we control them? In this course, we will explore some of the most interesting questions in psychology: questions about emotion. Emotions shape our perceptions of the world, influence critical life decisions, and allow us to connect with others. This seminar will provide a selective review of the scientific study of emotion in Affective Science. The first unit of the course will focus on the theoretical foundations, the basic science of emotion, and methods for measuring emotions. In the second unit of the course, we will discuss topics at the intersection of motivation and emotion, such as decision-making and self-control. In the third unit, we will delve into the social function of emotions. In the fourth unit of the course, we will study the ways people succeed and fail at controlling their emotions. In the fifth unit, we will discuss a variety of additional topics such as how emotions change across the lifespan, how emotions can be harnessed to engineer behavior change, as well as emotions and artificial intelligence. My goal is that you will leave this course with a scientifically-informed understanding of your own and others' emotions as well as 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.

Same as: CSRE 148P

PSYCH 149S. Vertical Neuroscience: How the Brain Enables Climbing. 3 Units.

Explores the brain mechanisms of physical action, including how the brain learns to create complex movements, the neural circuitry of the motor system, and how pain, fear, and adrenaline are closely tied to these systems. An emphasis is placed on real-life examples through weekly rock climbing courses that tie closely into the course content.

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 criminal 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 259

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 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 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. In accordance with Stanford virtual learning policies implemented for the Spring Quarter, all community engagement activities for this section will be conducted virtually. Please sign up for section 2 #33285 with Kendra, A. if you are interested in participating in virtual community engagement.

Same as: 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 160. Seminar on Emotion. 3 Units.

This undergraduate and graduate seminar will examine ancient Greek philosophical and contemporary psychological literatures relevant to emotion. Questions to be investigated include: What is the nature of emotions? What is the appropriate place in our lives for emotions? How should we manage our emotions? Do the emotions threaten the integrity of the agent? Meetings will be discussion oriented. Prerequisite: consent of instructor.

Same as: PHIL 375G, PSYCH 260

PSYCH 162. Brain Networks. 3 Units.

An essential aspect of the brain is its complex pattern of connectivity between neurons across different areas. This course will provide a comprehensive overview of the networks of the brain, analyzed from a range of standpoints from the microscopic to the macroscopic, with a particular focus on the organization of the human brain. Specific topics include brain anatomy, connectomics, structural and functional neuroimaging, graph theory and network science, dynamic models, and causal inference. The course will comprise a combination of lectures, paper discussions, and hands-on analysis exercises. The first session each week will be composed of lecture and background, and the second session will be focused on discussion and hands-on analyses, with students assigned to lead the discussion sessions. Prerequisites: Basic knowledge of neuroscience (equivalent to Psych 50A). A moderate level of programming experience will be required for hands-on exercises and problem sets. Primary exercises will be in Python.

Same as: PSYCH 267

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 165. Identity and Academic Achievement. 3 Units.

How do social identities affect how people experience academic interactions? How can learning environments be better structured to support the success of all students? In this class, we will explore how a variety of identities such as race, gender, social class, and athletic participation can affect academic achievement, with the goal of identifying concrete strategies to make learning environments at Stanford and similar universities more inclusive. Readings will draw from psychology, sociology, education, and popular press. This class is a seminar format.

Same as: AFRICAAM 165, CSRE 165

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, POLISCI 324L

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. 4 Units.

Social cognition - the ability to recognize others, understand their behaviors, and reason about their thoughts - 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 Psych 60 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.

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: Psych 60 or Psych141, or see instructor.

PSYCH 180. Advanced Seminar on Racial Bias and Structural Inequality. 4 Units.

How do we address racial bias and inequities? What role do our institutions play in creating, maintaining, and magnifying those inequities? What role do we play? In this course, we will examine racial bias and inequality in our neighborhoods, schools, workplaces, healthcare facilities, and criminal justice system. In every domain, we will focus our attention on the tools and interventions that can be used to mitigate bias and decrease racial disparities. This course will be conducted as a seminar. Limited enrollment.

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. Practicum in Teaching PSYCH 1. 5 Units.

Pedagogical training focused on teaching introductory psychology: creating engaging and inclusive lesson plans and activities, providing helpful feedback to students, responding to student feedback, and supporting student learning in 1:1 and small group interactions. Students create and iterate section activities, conduct and reflect on peer feedback, and produce a statement of teaching philosophy in their second quarter. Limited to current undergraduate PSYCH 1 Teaching Fellows. May be repeated for credit.

PSYCH 183. SPARQ Lab. 2-3 Units.

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

PSYCH 185. Racial Inequality across the Lifespan. 3 Units.

Imagine two children, one Black and one White, born on the same day and in the same country. By adulthood, these two will likely have had two remarkably different social experiences (e.g., the Black child will have received less education, income, health, and years to live). Why? Students in this course will tackle this complicated question from a psychological perspective. Together, we will examine how thinking, feeling, and behaving in ways that perpetuate stereotypes, prejudice, and discrimination contribute to racial inequality across the lifespan. The course will be conducted as a seminar, such that much of what you learn will be through group discussions, activities, and readings. A critical component of this class will be to practice writing about psychological research and social issues for the general audience. That is, students will write weekly opinion pieces that address and explain a particular area of inequality to a non-scientific audience.

Same as: AFRICAAM 185, CSRE 185C

PSYCH 186. The Psychology of Racial Inequality. 3 Units.

Our topic is the psychology of racial inequality - thinking, feeling, and behaving in ways that contribute to racial stereotyping, prejudice, and discrimination, and how these processes in turn maintain and perpetuate inequality between racial groups. We will examine how these processes unfold at both the individual and the institutional levels. Throughout this course, you will familiarize yourself with the psychological perspectives, methods, and findings that help explain racial inequality, and we will explore ways to promote racial equality. The course will be conducted as a seminar, but most of what you learn will be through the readings and discussions. That is, this course is minimally didactic; the goal is to have you engage thoughtfully with the issues and readings spurred in part by sharing perspectives, confusions, and insights through writing and discussion. Each student will facilitate at least one class session by providing an introductory framework for the readings (~10-minute presentation with handouts that overviews the concepts, issues, and controversies). Together, we will broaden our knowledge base on the subject and explain, from a psychological perspective, the pervasiveness of racial inequality. Prerequisites: PSYCH 1 and PSYCH 10.

Same as: AFRICAAM 286, CSRE 186, PSYCH 286

PSYCH 187. Research Methods in Cognition & Development. 4 Units.

For centuries, scientists have studied the invisible aspects of the physical world—air, electrons, bosons—by conducting experiments and developing new methods to measure them. Psychological science is a field in which researchers use the scientific method to study how the mind works. The ways in which humans think, reason, and learn is not directly observable, so scientists need to figure out how to design experiments and develop new methods to measure and study these mental processes. Needless to say, the informativeness of an experiment critically depends on its design. But what makes an experiment informative? Having first-hand experience in the actual research process is a powerful way to gain a deeper understanding of the basics of experimental methods. In particular, studies with young children often require careful considerations of experimental confounds and noisy measurements, making them ideal (and challenging) test cases for acquiring the fundamentals of experimental design. This course is an advanced, lab-based research course designed to provide an immersive experience of how to investigate the developing mind. The course will take you all the way from the design and implementation of an experiment, to the analysis and communication of its results. In this course, students will design a replication/extension of prior work in cognitive development, and conduct studies with children (at Bing Nursery School) as well as adults (within laboratory settings or online). Students will be provided with a general experimental context and potential dependent measures, and will develop their own studies in teams. The course will involve some lectures but it will mostly be a bootcamp-style workshop where students and instructors work together. Evaluation will primarily be based on presentations and final paper, along with a few other smaller assignments. Students should expect to spend a significant amount of hours outside of the classroom to collect their data. Instructors will expect students to have a basic understanding of statistical analyses and be comfortable with basic programming in R as well as interacting with children.

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

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

PSYCH 196A. Neuroscience research. 1 Unit.

This course is for undergraduate students who are part of the Wu Tsai Neurosciences Institute's Neuroscience Undergraduate Research Opportunity (NeURO) fellowship program.

PSYCH 196B. Foundational Topics in Neuroscience. 1 Unit.

This course is for undergraduate students who are part of the Wu Tsai Neurosciences Institute's Neuroscience Undergraduate Research Opportunity (NeURO) fellowship program.

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. Individually Supervised Practicum. 1-5 Unit.

Satisfies INS requirements for curricular practical training (CPT). May be repeated for credit. Prerequisites: consent of adviser.

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 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. Computational Neuroimaging. 1-3 Unit.

This course provides an in-depth survey and understanding of modern computational approaches to design and analyses of neuroimaging data. The course is a mixture of lectures and projects geared to give the student an understanding of the possibilities as well as limitations of different computational approaches. Topics include: signal and noise in MRI; general linear modeling; fMRI-adaptation; multivoxel pattern analyses; decoding and encoding algorithms; modeling population receptive fields. Required: Psych 204a; Recommended: Cognitive Neuroscience.

PSYCH 205. Foundations of Cognition. 3 Units.

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 implicit 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 209. Neural Network Models of Cognition. 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. Some background in computer programming, familiarity with differential equations, linear algebra, and probability theory, and one or more courses in cognition, cognitive development or ncognitive/systems neuroscience is required.

PSYCH 211. Developmental Psychology. 3 Units.

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.

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, policing 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: INTLPOL 207B, PUBLPOL 305B

PSYCH 217. Topics and Methods Related to Culture and Emotion. 3-5 Units.

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 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.
 Pre-requisite: EE 261 or equivalent. Or permission of instructor required.
 Same as: SYMSYS 1951

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 and norm intervention. 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. Priority for enrollment will be given to PhD students but advanced undergraduates may request permission for enrollment from the instructor.

PSYCH 224. Mapping the human visual system. 1-3 Unit.

The human visual system has more than two dozen topographic maps of the visual field. This course will explain principles of topographic maps in the visual system, mapping of visual areas using retinotopy, as well as modeling spatial and temporal computations in the visual system using population receptive fields. The class will combine reading and discussing papers that discovered these maps and computational principles with a lab component in which the students will analyze fMRI datasets that are used to map visual cortex.
 Same as: NEPR 224

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: episodic and statistical learning; impact of prior knowledge on new learning; and the role of MTL structures in learning and memory. May be repeated for credit.

PSYCH 227. Seminar in Psycholinguistics: Advanced Topics. 2-4 Units.

Adaptation to speaker variability in language use has received increasing attention in recent years from linguists and psychologists alike, who have recognized that, though long ignored, it poses a problem for static theories of language. The course will present a broad survey of recent work in this area across levels of linguistic representation, including phonetic, lexical, syntactic, prosodic, and semanto-pragmatic adaptation. We will discuss the cognitive underpinnings of adaptation and its relation to priming and learning, compare adaptation in varying domains, and consider the implications for theories of language and communication. The course will be organized primarily around discussion of assigned readings. Students will develop a research proposal relevant to issues in adaptation. May be repeated for credit.
 Prerequisite: LINGUIST 145 or background in any subfield of linguistics.
 Same as: LINGUIST 247

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. 3 Units.

This seminar explores how emerging findings at the interface of neuroscience, psychology, and economics combine to inform our understanding of how the brain makes decisions. Topics include neural processes related to reward, punishment, probability, risk, time, reflection, and social interaction, as well as theoretical implications and practical applications. We will briefly touch on the possibility of extending individual brain and behavioral data down to physiological and up to aggregate levels of analysis.
 Because the course involves interdisciplinary material, it takes the format of a research seminar with background discussions, and is targeted at graduate students and advanced undergraduates who aim to conduct related research. Goals include: (1) building familiarity with relevant neuroscience, psychology, and economics concepts; (2) increasing awareness of key relevant literature; and (3) preparation to conduct and advance innovative interdisciplinary research.

PSYCH 233. Longevity Innovations. 1 Unit.

Longer lives are generating new opportunities for products and services that support them. The Stanford Center on Longevity works closely with business leaders and entrepreneurs who are envisioning emerging longevity markets. The course overviews the broad demographic changes underway and related challenges that longer lives present. Within this context, students are required to think critically about new needs and opportunities in the longevity economy.

PSYCH 234. UNDERSTANDING 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.

PSYCH 235. Motivation and Emotion. 3 Units.

This graduate seminar will explore social-cognitive perspectives on motivation and emotion. Meetings will be discussion based. Prerequisites: Psychology 207 and consent of instructor.

PSYCH 236A. The Psychology of Scarcity: Its Implications for Psychological Functioning and Education. 3 Units.

This course brings together several literatures on the psychological, neurological, behavioral and learning impact of scarcities, especially those of money (poverty) time and food. It will identify the known psychological hallmarks of these scarcities and explore their implications for psychological functioning, well-being and education—as well as, how they can be dealt with by individuals and in education.

Same as: CSRE 136U, PSYCH 136

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 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 240A. Curiosity in Artificial Intelligence. 3 Units.

How do we design artificial systems that learn as we do early in life – as "scientists in the crib" who explore and experiment with our surroundings? How do we make AI "curious" so that it explores without explicit external feedback? Topics draw from cognitive science (intuitive physics and psychology, developmental differences), computational theory (active learning, optimal experiment design), and AI practice (self-supervised learning, deep reinforcement learning). Students present readings and complete both an introductory computational project (e.g. train a neural network on a self-supervised task) and a deeper-dive project in either cognitive science (e.g. design a novel human subject experiment) or AI (e.g. implement and test a curiosity variant in an RL environment). Prerequisites: python familiarity and practical data science (e.g. sklearn or R).

Same as: EDUC 234

PSYCH 241. Psychometrics and automated experiment design. 3 Units.

In this graduate seminar we will consider how modern computational techniques and old ideas in psychometrics combine to enable new approaches to experimentation. We will cover topics such as item response theory, optimal experiment design, adaptive experiments, and Bayesian optional stopping. We will read fairly technical papers and ask students to implement some of the algorithms we are studying.

PSYCH 242. Theoretical Neuroscience. 3 Units.

Survey of advances in the theory of neural networks, mainly (but not solely) focused on results of relevance to theoretical neuroscience. Synthesizing a variety of recent advances that potentially constitute the outlines of a theory for understanding when a given neural network architecture will work well on various classes of modern recognition and classification tasks, both from a representational expressivity and a learning efficiency point of view. Discussion of results in the neurally-plausible approximation of back propagation, theory of spiking neural networks, the relationship between network and task dimensionality, and network state coarse-graining. Exploration of estimation theory for various typical methods of mapping neural network models to neuroscience data, surveying and analyzing recent approaches from both sensory and motor areas in a variety of species. Prerequisites: calculus, linear algebra, and basic probability theory, or consent of instructor.

Same as: APPPHYS 293

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. New Map of Life. 2 Units.

This is an advanced graduate seminar focused on ways the ways that key life domains must change to accommodate century-long lives.

PSYCH 245A. Understanding Racial and Ethnic Identity Development. 3-5 Units.

This seminar will explore the impact and relative salience of racial/ethnic identity on select issues including: discrimination, social justice, mental health and academic performance. Theoretical perspectives on identity development will be reviewed, along with research on other social identity variables, such as social class, gender and regional identifications. New areas within this field such as the complexity of multiracial identity status and intersectional invisibility will also be discussed. Though the class will be rooted in psychology and psychological models of identity formation, no prior exposure to psychology is assumed and other disciplines-including cultural studies, feminist studies, and literature-will be incorporated into the course materials. Students will work with community partners to better understand the nuances of racial and ethnic identity development in different contexts. (Cardinal Course certified by the Haas Center).

Same as: AFRICAAM 245, CSRE 245, EDUC 245

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. Topics in Natural and Artificial Intelligence. 3 Units.

We will read a selection of recent papers from psychology, computer science, and other fields. We will aim to understand: How human-like are state of the art artificial intelligence systems? Where can AI be better informed by recent advances in cognitive science? Which ideas from modern AI inspire new approaches to human intelligence? Specific topics will be announced prior to the beginning of term.

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. Large-Scale Neural Network Modeling for Neuroscience. 1-3 Unit.

Introduction to designing, building, and training large-scale neural networks for modeling brain and behavioral data, including: deep convolutional neural network models of sensory systems (vision, audition, somatosensation); variational and generative methods for neural interpretation; recurrent neural networks for dynamics, memory and attention; interactive agent-based deep reinforcement learning for cognitive modeling; and methods and metrics for comparing such models to real-world neural data. Attention will be given both to established methods as well as cutting-edge techniques. Students will learn conceptual bases for deep neural network models and will also implement learn to implement and train large-scale models in Tensorflow using GPUs. Requirements: Fluency in Unix shell and Python programming; familiarity with differential equations, linear algebra, and probability theory; priori experience with modern machine learning concepts (e.g. CS229) and basic neural network training tools (eg. CS230 and/or CS231 n). Prior knowledge of basic cognitive science or neuroscience not required but helpful. Same as: CS 375

PSYCH 249L. Workshop on Incremental Language Processing. 1 Unit.

Language is processed incrementally over time. This has consequences for language comprehension, production, acquisition, and change, all of which occur at different timescales. What is the role of time in language? 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. 1-3 Unit.

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, and Computer Science. Emphasis on discussing recent empirical findings, methods and theoretical debates in the field. Same as: CS 431

PSYCH 250A. High-level Vision: From Neurons to Deep Neural Networks. 1-2 Unit.

This advanced level seminar is an interdisciplinary course focusing on understanding how computations in the brain enable rapid and efficient object perception. The course will cover topics from multiple perspectives drawing on recent research in neuroscience, computer science and psychology. Emphasis will be placed on examining recent findings pertaining to computational theories of high-level vision, ongoing debates in the field, and discussion of recent empirical findings.

PSYCH 251. Experimental Methods. 3 Units.

Graduate laboratory class in experimental methods for psychology, with a focus on open science methods and best practices in behavioral research. Topics include experimental design, data collection, data management, data analysis, and the ethical conduct of research. The final project of the course is a replication experiment in which students collect new data following the procedures of a published paper. The course is designed for incoming graduate students in psychology, but is open to qualified students from other programs who have some working knowledge of the R statistical programming language. Requirement: Psych 10/Stats 60 or equivalent. Same as: SYMSYS 195E

PSYCH 252. Statistical Methods for Behavioral and Social Sciences. 5 Units.

This course offers an introduction to advanced topics in statistics with the focus of understanding data in the behavioral and social sciences. It is a practical course in which learning statistical concepts and building models in R go hand in hand. The course is organized into three parts: In the first part, we will learn how to visualize, wrangle, and simulate data in R. In the second part, we will cover topics in frequentist statistics (such as multiple regression, logistic regression, and mixed effects models) using the general linear model as an organizing framework. We will learn how to compare models using simulation methods such as bootstrapping and cross-validation. In the third part, we will focus on Bayesian data analysis as an alternative framework for answering statistical questions. Please view course website: <https://psych252.github.io/>. Open to graduate students only. Requirement: Psych 10/Stats 60 or equivalent.

PSYCH 253. Advanced Statistical Modeling. 3 Units.

Introduction to high-dimensional data analysis and machine learning methods for use in the behavioral and neurosciences, including: supervised methods such as SVMs, linear and nonlinear regression and classifiers, and regularization techniques; statistical methods such as bootstrapping, signal detection, factor analysis, and reliability theory; metrics for model/data comparison such as representational similarity analysis; and unsupervised methods such as clustering. Students will learn how to both use existing statistical data analysis packages (such as scikit-learn) as well to build, optimize, and estimate their own custom models using an optimization framework (such as Tensorflow or Pytorch). Requirement: Psych 251. Familiarity with python programming and multivariable calculus and linear algebra (Math 51) highly recommended.

PSYCH 254. 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 255. Seminar on Motivation. 3 Units.

Selective overview of the scientific study of motivation. Our focus is on interesting, experimentally tractable ideas. Meetings will be discussion based.

PSYCH 256. Race at Work. 3-5 Units.

In this practicum, students will examine how race works in a variety of institutional spaces by participating in community partnerships relevant to criminal justice, education, economic development, or health. Limited enrollment. Prerequisite for undergraduates: Psych 1, Psych 70, and one of the following: Psych 150, Psych 180, Psych 298, Psych 103, Psych 135, Psych 30N, or Psych 138.

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. 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 150

PSYCH 260. Seminar on Emotion. 3 Units.

This undergraduate and graduate seminar will examine ancient Greek philosophical and contemporary psychological literatures relevant to emotion. Questions to be investigated include: What is the nature of emotions? What is the appropriate place in our lives for emotions? How should we manage our emotions? Do the emotions threaten the integrity of the agent? Meetings will be discussion oriented. Prerequisite: consent of instructor.

Same as: PHIL 375G, PSYCH 160

PSYCH 261. African American Child and Adolescent Mental Health: An Ecological Approach. 3-4 Units.

African American children and adolescents face a number of challenges (e.g., racism, discrimination, lack of access to resources, community violence) that can impact their mental health. Yet, they possess and utilize many strengths in the face of challenge and adversity. This seminar will explore the most salient historical, social, cultural, and ecological factors that influence the mental health and resilience of African American youth, with attention to contextual determinants that shape mental health. Applying an ecological systems approach, the course will focus on how families, schools, and communities are integral to youth's adjustment and well-being. By utilizing a culturally specific and context based lens in analyzing empirical, narrative, and visual content, students will better understand factors that can promote or inhibit the mental health and resilience of African American children and adolescents across development.

Same as: CSRE 372, EDUC 372

PSYCH 262. Measurement and the Study of Change in Social Science Research. 1-5 Unit.

This course is a survey of methodological issues associated with the measurement of psychological constructs and processes of change. General areas to be covered include use of latent variable models (structural equation modeling), classical test theory, generalizability theory, principal component analysis, factor analysis, item response theory and how these models facilitate and/or constrain the study of change processes. Students will work through application/implementation of the models through hands-on analysis of simulated and empirical data, acquire experiences in the formulation of research questions and study designs that are appropriately tethered to the different theoretical perspectives invoked by the different models.

Same as: COMM 369

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. Unleashing Personal Potential: Behavioral Science and Design Thinking Applied to Self. 4 Units.

This course facilitates the application of the methods, theories, and findings of behavioral science to students own lives and improvement projects. It does so by combining behavioral science with a design thinking approach. You will learn to identify your potential, navigate to achieve it, and stay resilient during the journey. Students will design their own action plans, define goals and prototype strategies to test them, in an iterative feedback cycle. Our course thus blends two intellectual streams that seldom intersect: behavioral science and design thinking.

Same as: EDUC 426

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 axess. There will be an application process on the first day of class if there is overwhelming interest. Please contact the course TA, Isabelle Tay (isabelletay[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. Brain Networks. 3 Units.

An essential aspect of the brain is its complex pattern of connectivity between neurons across different areas. This course will provide a comprehensive overview of the networks of the brain, analyzed from a range of standpoints from the microscopic to the macroscopic, with a particular focus on the organization of the human brain. Specific topics include brain anatomy, connectomics, structural and functional neuroimaging, graph theory and network science, dynamic models, and causal inference. The course will comprise a combination of lectures, paper discussions, and hands-on analysis exercises. The first session each week will be composed of lecture and background, and the second session will be focused on discussion and hands-on analyses, with students assigned to lead the discussion sessions. Prerequisites: Basic knowledge of neuroscience (equivalent to Psych 50A). A moderate level of programming experience will be required for hands-on exercises and problem sets. Primary exercises will be in Python.

Same as: PSYCH 162

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.

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. Communicating Psychology. 3 Units.

A graduate seminar on writing and communication of psychological research, both for our colleagues and audiences outside the field.

PSYCH 272. Psychology and American Indian/Alaska Native Mental Health. 3-5 Units.

Western medicine's definition of health as the absence of sickness, disease, or pathology; Native American cultures' definition of health as the beauty of physical, spiritual, emotional, and social things, and sickness as something out of balance. Topics include: historical trauma; spirituality and healing; cultural identity; values and acculturation; and individual, school, and community-based interventions. Prerequisite: experience working with American Indian communities.

Same as: EDUC 340, NATIVEAM 240

PSYCH 273. Changing Mindsets and Contexts: How to Create Authentic, Lasting Improvement. 3 Units.

Many wise interventions offer people new beliefs but have not addressed the contexts in which those beliefs will be situated and implemented. This can limit the interventions' effectiveness. In this course, we will explore how combining mindset change with consideration of, or change to, the setting can enhance the authenticity of the intervention and the duration of its effects. Topics will include contextual boundary conditions on direct-to-student treatments, the nature of contextual affordances, and the creation of contextual affordances.

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 276. Graduate Research. 1-15 Unit.

Intermediate-level research undertaken with psychology faculty. Prerequisite: consent of instructor.

PSYCH 277. What Is a Mindset and How Does it Work?. 3-4 Units.

What is a mindset and how does it work? This seminar will explore existing and ongoing research, ranging from research on mindsets about talent and personality to mindsets about disease, stress and aging. We will focus on key questions related to the advancement of mindset science and intervention, including: how is a mindset defined and how is it distinct from related constructs? What are the mechanisms through which mindsets exert effects on physiology and behavior? How do mindsets speak to the issues of the interplay of nature and nurture, body and mind, cognitions and emotion? How do mindsets function at the group, organization or cultural level? How are mindsets effectively changed? What are the limits of mindsets? This seminar is offered to graduate students and others with the instructor's permission.

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. Measuring Learning in the Brain. 3 Units.

Everything we learn - be it a historical fact, the meaning of a new word, or a skill like reading, math, programming or playing the piano - depends on brain plasticity. The human brain's incredible capacity for learning is served by a variety of learning mechanisms that all result in changes in brain structure and function over different time scales. The goal of this course is to (a) provide an overview of different learning systems in the brain, (b) introduce methodologies and experiments that have led to new discoveries linking human brain plasticity and learning, (c) design an experiment, collect neuroimaging data, and measure the neurobiological underpinnings of learning in your own brain with MRI. The first section of the course will involve a series of lectures and discussions on the foundations of plasticity and learning with particular attention to experimental methods used in human neuroimaging studies. The second part of the course will involve workshops on designing and implementing experiments in MATLAB/Psychtoolbox or Python/PsychoPy. During this part of the course students will design, present and implement their own experiments as group projects. Finally, students will learn how to collect and analyze MRI data by being participants in their own fMRI experiments or analyzing publicly available datasets. Requirements: This class is designed for students who are interested in gaining hands-on experience with measuring the neurobiological underpinnings of learning. Student projects will involve designing experiments, collecting and analyzing data. So some experience with MATLAB/Python or an equivalent programming language is required. Some background in neuroscience (at least 1 course) is also required as we will assume basic knowledge.

Same as: EDUC 464, NEPR 464, SYMSYS 195M

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 Unit.

Pedagogical training focused on teaching introductory psychology: creating engaging and inclusive lesson plans and activities, providing helpful feedback to students, responding to student feedback, and supporting student learning in 1:1 and small group interactions. Second quarter focuses on designing and iterating section activities, giving and receiving peer feedback on teaching, and reflecting on teaching practices. Limited to current graduate PSYCH 1 Teaching Fellows. May be repeated for credit.

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 spacerface.org. Permission of instructor required.

Same as: PSYCH 180A

PSYCH 284. Graduate Seminar in Political Psychology. 1-3 Unit.

For students interested in research in political science, psychology, or communication. Methodological techniques for studying political attitudes and behaviors. May be repeated for credit.

Same as: COMM 308, POLISCI 321

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

Theory of Mind \hat{c} the ability to reason and think about other minds \hat{c} 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 286. The Psychology of Racial Inequality. 3 Units.

Our topic is the psychology of racial inequality - thinking, feeling, and behaving in ways that contribute to racial stereotyping, prejudice, and discrimination, and how these processes in turn maintain and perpetuate inequality between racial groups. We will examine how these processes unfold at both the individual and the institutional levels. Throughout this course, you will familiarize yourself with the psychological perspectives, methods, and findings that help explain racial inequality, and we will explore ways to promote racial equality. The course will be conducted as a seminar, but most of what you learn will be through the readings and discussions. That is, this course is minimally didactic; the goal is to have you engage thoughtfully with the issues and readings spurred in part by sharing perspectives, confusions, and insights through writing and discussion. Each student will facilitate at least one class session by providing an introductory framework for the readings (~10-minute presentation with handouts that overviews the concepts, issues, and controversies). Together, we will broaden our knowledge base on the subject and explain, from a psychological perspective, the pervasiveness of racial inequality. Prerequisites: PSYCH 1 and PSYCH 10.

Same as: AFRICAAM 286, CSRE 186, PSYCH 186

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. Perspectives on Belonging. 3 Units.

How do people make sense of their relationship with a community or society and how does this affect their behavior and outcomes? We will examine classic and contemporary research and theory on what belonging is; how people draw inferences about their belonging in different contexts; cultural and social-group variation; and how belonging-related motivations affect diverse behaviors.

PSYCH 289. Longitudinal Data Analysis in Social Science Research. 1-5 Unit.

This course offers a project-based orientation to methodological issues associated with the analysis of multivariate and/or longitudinal data in the social sciences. General areas to be covered include the manipulation/organization/description of the types of empirical data obtained in social science research, and the application/implementation of multivariate analysis techniques to those data. Students will, through hands-on analysis of their data, acquire experiences in the formulation of research questions and study designs that are appropriately tethered to a variety of advanced analytical methods. Limited to PhD students and consent of instructor.

Same as: COMM 365

PSYCH 290. Natural Language Processing & Text-Based Machine Learning in the Social Sciences. 4 Units.

Digital communications (including social media) are the largest data sets of our time, and most of it is text. Social scientists need to be able to digest small and big data sets alike, process it and extract psychological insight. This applied and project-focused course introduces students to a Python codebase developed to facilitate text analysis in the social sciences (see dlatk.wwpb.org -- knowledge of Python is helpful but not required). The goal is to practice these methods in guided tutorials and project-based work so that the students can apply them to their own research contexts and be prepared to write up the results for publication. The course will provide best practices, as well as access to and familiarity with a Linux-based server environment to process text, including the extraction of words and phrases, topics and psychological dictionaries. We will also practice the use of machine learning based on text data for psychological assessment, and the further statistical analysis of language variables in R. Familiarity with Python is helpful but not required. Basic familiarity with R is expected. The ability to wrangle data into a spreadsheet-like format is expected. A basic introduction to SQL will be given in the course. Familiarity with SSH and basic Linux is helpful but not required. Understanding of regression is expected.

Same as: SOC 281, SYMSYS 195T

PSYCH 291. Causal Cognition. 3 Units.

Causality is central to our understanding of the world and of each other. We think causally when we predict what will happen in the future, infer what happened in the past, and interpret other people's actions and emotions. Causality is intimately linked to explanation -- to answering questions about why something happened. In this discussion-based seminar class, we will first read foundational work in philosophy that introduces the main frameworks for thinking about causation. We will then read some work on formal and computational theories of causation that was inspired by these philosophical frameworks. Equipped with this background, we will study the psychology of causal learning, reasoning, and judgment. We will tackle questions such as: How can we learn about the causal structure of the world through observation and active intervention? What is the relationship between causal reasoning and mental simulation? Why do we select to talk about some causes over others when several causes led to an outcome? Toward the end of the course, we will discuss how what we have learned in psychology about causation may be useful for other fields of inquiry, such as legal science as well as machine learning and artificial intelligence.

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. What makes a good explanation? Psychological and philosophical perspectives. 4 Units.

Explanation is a topic of longstanding interest in philosophy and psychology, and has recently attracted renewed attention due to novel challenges in interpreting and interacting with relatively opaque AI systems. In this graduate seminar, we will study the science and engineering of explanations, combining perspectives from philosophy, psychology, AI, and the legal sciences. We will ask questions like: When do we ask for explanations? What makes a good explanation? How can we build machines that can understand and explain? This interdisciplinary seminar is co-taught by Thomas Icard (Philosophy) and Tobias Gerstenberg (Psychology). We will meet twice a week (Tuesdays and Thursdays 10:30am-11:50am) to discuss research articles from a range of disciplines. Students are expected to write responses based on their readings, lead the discussion on one of the papers, and actively participate in the discussion otherwise. As a final project, students will outline a novel study on explanation that makes an empirical, modeling, or theoretical contribution. Participation is restricted to a maximum of 12 graduate students (by application). The course website, with information about application, can be found here: phil350.stanford.edu. Same as: PHIL 350

PSYCH 295. Seminar on the Science of Meditation. 3 Units.

What is meditation? What immediate and longer-term effects does this practice have on cognition? What are the mechanisms of these effects? In this small seminar we will try to gain insight into these questions by reading and discussing recent papers drawn from psychology and neuroscience. Emphasis will be placed on careful consideration of the evidence within papers and theoretical synthesis across papers. We will also use ancient and modern studies of meditation to reflect on possibilities for the scientific study subjective experience. May be repeat for credit.

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 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.

(Formerly IPS 250) (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 ways intragroup dynamics 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: INTLPOL 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, BIOG 459, BIOE 459, CHEM 459, CHEMENG 459

PSYCH 801. Master's TGR Project. 0 Units.**PSYCH 802. PhD TGR Dissertation. 0 Units.**