Cognitive science is the scientific study of the mind in a transdisciplinary framework. The Department of Cognitive Science at Case Western Reserve University is specifically dedicated to the study of human higher cognition, including language, gesture, advanced social cognition, mathematical invention, scientific discovery, art, religion, morality, music, literature, advanced tool use and advanced technology, theater and dance, fashions of dress, sign systems, creativity, and culture. The department draws on methods of research in the biological sciences, the social sciences, and the humanities. Its educational mission is to provide students with the best possible opportunity to integrate a wide variety of approaches and apply them to the study of human higher cognition.

The department offers an undergraduate major and minor in cognitive science and a master's degree in cognitive linguistics. By developing wide-ranging expertise in at least two or three relevant disciplines, our students can prepare for a variety of career options. Training in several disciplines will also provide increased choices for postgraduate study.

### Department Faculty

**Todd Oakley, PhD**  
(University of Maryland)  
*Professor and Chair*  
Cognitive linguistics; discourse analysis; attention

**William E. Deal, PhD**  
(Harvard University)  
*Severance Professor in the History of Religion*  
Cognitive science of religion and ethics; Buddhist theory of mind

**Fey Parrill, PhD**  
(University of Chicago)  
*Associate Professor*  
Language and co-speech gesture

**Vera Tobin, PhD**  
(University of Maryland)  
*Associate Professor*  
Cognitive linguistics, pragmatics, literature; evolution and development

**Mark Turner, PhD**  
(University of California, Berkeley)  
*Institute Professor*  
Higher-order cognition and creativity; conceptual integration

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### Secondary Faculty

**Florin Berindeanu, PhD**  
(University of Georgia)  
*Instructor, Department of Classics*

**Daniela Calvetti, PhD**  
(University of North Carolina, Chapel Hill)  
*James Wood Williamson Professor, Department of Mathematics, Applied Mathematics, and Statistics*

**Angela Ciccia, PhD**  
(Case Western Reserve University)  
*Associate Professor, Department of Psychological Sciences*

**Fred Collopy, PhD**  
(Wharton School of the University of Pennsylvania)  
*Professor, Department of Information Systems, Weatherhead School of Management*

**Heath A. Demaree, PhD**  
(Virginia Institute of Technology)  
*Professor and Chair, Department of Psychological Sciences*

**Robert L. Greene, PhD**  
(Yale University)  
*Professor, Department of Psychological Sciences*

**Sandra Russ, PhD**  
(University of Pittsburgh)  
*Distinguished University Professor and Louis D. Beaumont University Professor, Department of Psychological Sciences*

**Peter Thomas, PhD**  
(University of Chicago)  
*Professor, Department of Mathematics, Applied Mathematics, and Statistics*

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### Adjunct Faculty

**Per Æge Brandt, Doctorat d'Etat**  
(Sorbonne I, Paris)  
*Adjunct Professor, Retired*

**Yohannes Haile-Selassie, PhD**  
(University of California, Berkeley)  
*Adjunct Professor; Curator and Head of Physical Anthropology, Cleveland Museum of Natural History*

**Michael Householder, PhD**  
(University of California, Irvine)  
*Adjunct Associate Professor; Associate Director, SAGES*

**Bruce M. Latimer, PhD**  
(Kent State University)  
*Adjunct Professor, Cleveland Museum of Natural History*

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### Undergraduate Programs

#### Major
In addition to meeting general education requirements, cognitive science majors must complete a minimum of 30 semester hours in cognitive science and approved related course work: 15 hours in the foundation component and 15 hours of elective course work. The foundation courses
provide all students with a common basis for further study. They consist of:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>COGS 101</td>
<td>Introduction to Cognitive Science</td>
<td>3</td>
</tr>
<tr>
<td>COGS 102</td>
<td>Introduction to Cognitive Neuroscience</td>
<td>3</td>
</tr>
<tr>
<td>COGS 201</td>
<td>Human Cognition in Evolution and Development</td>
<td>3</td>
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<tr>
<td>COGS 202</td>
<td>Cognition and Culture</td>
<td>3</td>
</tr>
<tr>
<td>ANTH 319</td>
<td>Introduction to Statistical Analysis in the Social Sciences</td>
<td>3</td>
</tr>
<tr>
<td>PSCL 282</td>
<td>Quantitative Methods in Psychology</td>
<td></td>
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<tr>
<td>STAT 201</td>
<td>Basic Statistics for Social and Life Sciences</td>
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</tbody>
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And one of the following quantitative methods courses:

- COGS 101
- ANTH 319
- PSCL 282
- STAT 201

Five elective courses (three must be at the 200 or 300 level) 15

Total Units 30

**Minor**

The minor requires students to take the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>COGS 101</td>
<td>Introduction to Cognitive Science</td>
<td>3</td>
</tr>
<tr>
<td>One of the following: 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COGS 102</td>
<td>Introduction to Cognitive Neuroscience</td>
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<tr>
<td>COGS 201</td>
<td>Human Cognition in Evolution and Development</td>
<td></td>
</tr>
<tr>
<td>COGS 202</td>
<td>Cognition and Culture</td>
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</tr>
</tbody>
</table>

Three COGS courses at the 200 or 300 level 9

Total Units 15

The minor provides a good basic grounding in cognitive science, and allows students to narrow their exposure to those aspects of the field most relevant to their other academic interests. Individual programs can be developed in consultation with the chair of the department.

**Graduate Program**

**MA in Cognitive Linguistics**

“Cognitive linguistics goes beyond the visible structure of language and investigates the considerably more complex backstage operations of cognition that create grammar, conceptualization, discourse, and thought itself. The theoretical insights of cognitive linguistics are based on extensive empirical observation in multiple contexts, and on experimental work in psychology and neuroscience. Results of cognitive linguistics, especially from metaphor theory and conceptual integration theory, have been applied to wide ranges of nonlinguistic phenomena.”


Candidates may apply for admission to the degree program in cognitive linguistics with the purpose of pursuing the MA, or for non-degree status with the purpose of taking courses for credit that can be transferred to other institutions. The MA follows Plan A as described in the School of Graduate Studies (http://bulletin.case.edu/schoolofgraduatestudies/academicrequirements) section of this bulletin. Accordingly, it requires 30 credit hours and a written MA thesis.

**Courses**

**COGS 101. Introduction to Cognitive Science. 3 Units.**

This course introduces students to the field of cognitive science. Cognitive scientists are interested in the nature of the human mind—basically, we ask how humans think. This is a huge question, and has been addressed in one way or another by pretty much every academic field. Cognitive science tries to unite work from many different fields, including computer science, neuroscience, psychology, linguistics, philosophy, music, art, and literary theory. In this course, you'll get a basic introduction to some of the topics that are central to human cognition, such as intelligence, categorization, language, and creativity. We'll ask what can be gained by taking an integrated, cognitive scientific approach to these topics.

**COGS 102. Introduction to Cognitive Neuroscience. 3 Units.**

A survey of the fundamental methods, findings, and theories that attempt to understand the human mind from a neuroscientific standpoint. The course provides the student with background knowledge of brain processes underlying such psychological phenomena as consciousness, sensation, perception, thought, language, and voluntary action. Since many fields of neuroscience have contributed to cognitive neuroscience, the approach of this course is cross-disciplinary. It introduces theories and data from clinical and experimental neuropsychology, brain imaging, neuroelectric and neuromagnetic brain activity, the neuroscience of language, and behavioral neuroscience, among other fields.

**COGS 201. Human Cognition in Evolution and Development. 3 Units.**

COGS 201 covers mind unfolding in time, including the fundamental methods, findings, and theories of human mental phylo- and ontogenesis. It provides the student with background knowledge about the unfolding of cognitive structures and functions over time, in both the deep temporal perspective of evolution (measured across many lifetimes) and the shorter one of development (measured within single lifetimes). The approach of the course is cross-disciplinary, including approaches that come from anthropology, archaeology, philosophy, computing science, comparative psychology, primatology, and comparative linguistics, among others.

**COGS 202. Cognition and Culture. 3 Units.**

This course studies the human mind in its natural environment: culture. It covers the fundamental methods, findings, and theories that attempt to understand the growth and evolution of cognition from either a social science or humanistic standpoint. It provides the student with background knowledge of theories of human cultural evolution and change, of the relationship between the cognizing individual and larger social-cognitive structures, and of such phenomena as distributed networks, cooperative mental work, and the phenomenology of human experience. Many disciplines have contributed to this knowledge; hence the approach of this course is cross-disciplinary, including ideas from cultural anthropology, literary studies, art and art history, musicology, philosophy, and the history of technology, among others.
COGS 205. Cognition and Design. 3 Units.
Urbanism is design; architecture is design; of course, the aesthetic shaping of artifacts (such as computers, cars, and coffee machines) is design. Configuring surfaces, volumes, and portions of space in special ways, creating and changing formats for things and places that allow cultural practices to unfold while delimiting them, are essential "designing" endeavors of human civilization and are, necessarily, activities based on the cognitive capacities and constraints of our species. We 'cognize' the human world in terms and frames of 'designed' surroundings. Design is a basic expressive activity, by which we interact with our artificial and natural surroundings and create 'interfaces' between mind and reality, thus upholding and interpretable world. Landscapes and cityscapes, work spaces of all sorts, buildings and parks, exteriors and interiors of homes, factories, institutions, and temples; furniture, artifacts such as machines, tools, weapons, symbolic objects, even the configuration ('building') of our own bodies, are design. An inquiry into cultural cognition, aiming to understand how humans as socio-cultural beings think and feel, therefore needs to explore this dimension of spatial expressivity and to acknowledge it as a constitutive fact of human meaning production; it needs to study the aesthetic and pragmatic, political and historical, philosophical and religious, and simply everyday practical, semiotic aspects of this basic form of human creativity. This course will focus on spatial expressivity-design—in several primary keys and scales, including design for learning; design for verbal and technical communication, interaction, and commerce; design for expressions of authority and deliberation; and design for emotional display.

COGS 206. Theory of Cognitive Linguistics I. 3 Units.
This is the first course in a two-course sequence presenting theory and practice of cognitive linguistics. Offered as COGS 206 and COGS 406.

COGS 215. Words and Mind. 3 Units.
There is something fascinating and special about words. They are the aspect of language that everyone knows about and pays attention to—and every academic discipline with an interest in language has something to say about them! The sheer number of words known by every speaker of any human language is quite vast (and the exact number is a mystery). In this class we will learn about words in all their aspects, and see what the wide weirdness of words can help us understand about the human mind. Subjects covered include the question of what makes a word (is "ouch" a word? *ain't*?); word origins; taboo words; words and memory; word boundaries; and word games, puns, and puzzles.

COGS 272. Morality and Mind. 3 Units.
Recent research in cognitive science challenges ethical perspectives founded on the assumption that rationality is key to moral knowledge or that morality is the product of divine revelation. Bedrock moral concepts like free will, rights, and moral agency also have been questioned. In light of such critiques, how can we best understand moral philosophy and religious ethics? Is ethics primarily informed by nature or by culture? Or is ethics informed by both? This course examines 1) ways in which cognitive science—and related fields such as evolutionary biology—impact traditional moral perspectives, and 2) how the study of moral philosophy and comparative ethics forces reconsideration of broad cognitive science theories about the nature of ethics. The course examines the concept of free will as a case study in applying these interpretive viewpoints. Interdisciplinary readings include literature from moral philosophy, religious ethics, cognitive science, and evolutionary biology. Offered as COGS 272 and RLGN 272.

COGS 301. Special Topics in Cognitive Science. 3 Units.
Special Topics in Cognitive Science. Topics vary. Permission of department is required. Offered as COGS 301 and COGS 401.

COGS 302. SAGES Departmental Seminar: Methods and Theories in Cognitive Science. 3 Units.
This course takes a look at the discipline of cognitive science by exploring the methods that cognitive scientists use in their research. We'll discuss how different methods reflect different approaches and traditions of thought and how they provide different answers to particular questions. We'll also discuss the process of translating research into writing and talk about how different kinds of writing reflect the many different methods used in cognitive science. Recommended preparation: COGS 101, COGS 102, COGS 201, and COGS 202. Counts as SAGES Departmental Seminar.

COGS 307. Cog Linguistics Theory II. 3 Units.
This is the second course in a two-course sequence presenting theory and practice of cognitive linguistics. Offered as COGS 307 and COGS 407. Counts as SAGES Departmental Seminar.

COGS 308. Advanced Research Workshop I. 3 Units.
This course is an advanced research workshop for undergraduates and MA students. The workshop involves development of research topics (theoretical or empirical), and working on them with the input of other workshop members to produce final papers. Offered as COGS 308 and COGS 408.

COGS 309. Advanced Research Workshop II. 3 Units.
This course is an advanced research workshop for undergraduates and MA students. The workshop involves development of research topics (theoretical or empirical), and working on them with the input of other workshop members to produce final papers. MA students in cognitive linguistics will typically take this course as the second part of a two-part sequence. Offered as COGS 309 and COGS 409.

COGS 310. Cognitive Science of Religion. 3 Units.
This course introduces theories and methods in the cognitive science of religion. Particular emphasis is placed on applying cognitive scientific concepts and theories to such religious issues as belief in deities, religious ritual, and morality. We examine such topics as the relationship of religious studies to evolution and cognition, cognitive theories or religious ritual, anthropomorphism and religious representation, religion as an evolutionary adaptation, and cognitive semantics and religious language. Course work includes student-led discussions, a research-intensive journal-length essay on a topic chosen in consultation with the Instructor, and presentation of research findings to the class. Course readings are taken from the humanities, the social sciences, and natural sciences. Offered as COGS 310, COGS 410, RLGN 310 and RLGN 410.

COGS 311. Mind and Media. 3 Units.
An introduction to the study of mind and media, including the study of multimodal communication. This course investigates patterns of human cognition that are ancient to human beings and upon which media have converged for powerful, immersive effect. The cognitive processes studied include perception, sensation, imagination, joint attention, narrative conception, simulation, dreaming, identity construction, imaginative play, and implicit learning. Students engage in hands-on media analysis to study how basic human mental operations are used in media to achieve a variety of effects. Students will be given access to a private website of instructions, readings, and materials for the course, and will be introduced to a range of vast, rich, searchable databases of media. Students will have ample opportunity to do research inside such databases. Offered as COGS 311 and COGS 411. Counts as SAGES Departmental Seminar.
COGS 312. Second Language Acquisition I. 3 Units.
This course is an introduction to the growing field of second language acquisition (SLA). SLA seeks to understand the linguistic, psychological and social processes that underlie the learning and use of second language(s). The goal of research is to identify the principles and processes that govern second language learning and use. SLA is approached from three perspectives in the course: 1) as linguistic knowledge; 2) as a social and personality-mediated process. Important factors in second language learning will be identified and discussed. These include: age-related differences, the influence of the first language, the role played by innate (universal) principles, the role of memory processes, attitudes, motivation, personality and cognitive styles, and formal versus non-formal learning contexts. The objective of this course is to survey the principal research in second language acquisition. Students will become familiar with the major research issues through their reading of both primary and secondary sources, as well as through lectures and class discussions. Offered as COGS 312, COGS 412, LING 301 and LING 401.

COGS 313. Special Topics in Cognitive Linguistics. 3 Units.
This course covers special topics in the field of cognitive linguistics. Topics will vary from semester to semester. Offered as COGS 313 and COGS 413.

COGS 314. Second Language Acquisition II: Second Language Acquisition Research and Second Language Teaching. 3 Units.
This course will examine various issues in second language acquisition research that are particularly relevant to foreign language teaching and learning. Topics covered will include: the role of input (listening/reading) vs. output (speaking/writing); implicit vs. explicit learning; negative vs. positive evidence (including the role of error correction); affective factors (motivation, anxiety); individual differences; teachability hypothesis and syllabus construction, program design/evaluation, language testing, among others. The purpose of this course is to survey the principal research in the acquisition of second language that is relevant to second language teaching in a classroom setting, and to obtain the state-of-the-art knowledge of the SLA research literature that is relevant to L2 teaching. The focus is not necessarily on the practical application of the SLA research, although we will not exclude discussion of classroom application. Rather, we critically examine and evaluate SLA research and come up with our own synthesizes with respect to various issues. To achieve this goal, we should ask following questions in reading and discussing the relevant literature: 1) What are the main claims that the author(s) make(s)? 2) Are the author's claims sound? If not why? 3) What further research is needed to answer remaining questions? Students will become familiar with the major research issues through their reading of both primary and secondary sources, as well as through lectures and class discussions. The students are required to complete a term project that addresses the issues treated in the course. Offered as LING 302, LING 402, COGS 314 and COGS 414. Prereq: COGS 301 or prerequisites not met permission.

COGS 316. Decision-Making. 3 Units.
This course is a topical introduction to decision-making, a major area of cognitive social science, with connections to economics, law, political science, business, policy, and related fields. Topics include game theory and rational calculation, equilibria, kinds of choice, heuristics, the role of affect in decision, framing, bounded rationality, mechanisms of choice such as heuristics, the role of social cognition in choice, concepts of self and other, and computer modeling of choice. The course also includes an introduction to the design of empirical behavioral research. Offered as COGS 316 and COGS 416. Counts as SAGES Departmental Seminar.

COGS 317. Cognitive Diversity. 3 Units.
This course surveys research from cognitive science (psychology, linguistics, neuroscience, etc.) on the ways that different people think differently. We will consider dimensions such as sex, gender, sexual orientation, race/ethnicity, bodily differences, cultural differences, and effects of speaking different languages. Students will choose the last two topics at the end of the semester (Different religions? Different ages? Whatever interests the class!). Offered as COGS 317 and COGS 417. Counts for CAS Global & Cultural Diversity Requirement.

COGS 319. Elements of Surprise. 3 Units.
This course will connect research into the cognitive experiences of surprise and suspense with the ways people can create those experiences for each other—cooperatively and uncooperatively—in everyday interaction and in cultural products like jokes, architecture, music, written narratives, films, and games. Topics include predictions and expectations involved in perceiving and navigating the physical world, cognitive biases, timing in conversation, language processing, attention, perspective-taking, counterfactual thinking, the psychological structure of explanations, and the psychology of "fair play." Offered as COGS 319 and COGS 419.

COGS 322. Human Learning and the Brain. 3 Units.
This course focuses on the question, "How does the human brain learn?" Through assigned readings, extensive class discussions, and a major paper, each student will explore personal perspectives on learning. Specific topics include, but are not limited to: the brain's cycle of learning; neocortex structure and function; emotion and limbic brain; synapse dynamics and changes in learning; images in cognition; symbolic brain (language, mathematics, music); memory formation; and creative thought and brain mechanisms. The major paper will be added to each student's SAGES writing portfolio. In addition, near the end of the semester, each student will make an oral presentation on a chosen topic. Offered as BIOL 302 and COGS 322. Counts as SAGES Departmental Seminar.

COGS 325. Cognitive Approaches to Literature. 3 Units.
This course approaches literature as a window into language, in which cognition is characterized by the same imaging and imaginary properties as artistic literature. It is an attempt to identify and analyze procedures as aesthetically interesting and generally relevant forms of human thinking, feeling, imagining, fantasizing, and conceptualizing. The course introduces contemporary theories of literature in relation to language and mind, and it presents and discusses practical applications in critical reading and text analysis, using examples from modern literature in the main genres. A student may earn credit for either COGS 325 or COGS 425 but not both. Recommended preparation: COGS 101, COGS 202. Offered as COGS 325 and COGS 425.

COGS 327. Gesture in Cognition and Communication. 3 Units.
Most people never notice that when they are talking, they're also gesturing. Why do we produce these gestures? What can studying them tell us about the human mind? This course surveys scientific research on gesture, exploring topics such as the role of gesture in communication, cross-cultural differences in gesture, and the relationship between gesture and signed languages. The course will focus on gestures produced with speech, but will cover symbolic and ritualized gesture in the visual arts and in dance. Offered as COGS 327, COGS 427 and MLIT 327. Counts as SAGES Departmental Seminar.
COGS 329. Performance and the Embodied Mind. 3 Units.
In the past twenty years cognitive scientists working in neuroscience, psychology, linguistics, philosophy, and related fields have made great progress in understanding perception, empathy, the human mind’s sense of space and movement, emotions, meaning-making, and many other cognitive areas that are crucial to producing, enacting, and responding to performances on stage. This course will look at ways of incorporating many of the insights of cognitive science into the existing work of theatre and performance scholarship. The course will thus link a more traditional approach to the body in theatre and dance studies, where it has commonly been considered one of the main means of communication, to a most up-to-date research on embodied cognition. Observation of live and pre-recorded dance and theatre performances will regularly be used to supplement the theoretical discussion. Recommended preparation: COGS 101, COGS 202.

COGS 330. Cognition and Computation. 3 Units.
An introduction to (1) theories of the relationship between cognition and computation; (2) computational models of human cognition (e.g. models of decision-making or concept creation); and (3) computational tools for the study of human cognition. All three dimensions involve data science: theories are tested against archives of brain imaging data; models are derived from and tested against datasets of e.g., financial decisions (markets), legal rulings and findings (juries, judges, courts), legislative actions, and healthcare decisions; computational tools aggregate data and operate upon it analytically, for search, recognition, tagging, machine learning, statistical description, and hypothesis testing. Offered as COGS 330, COGS 430, DSCI 330 and DSCI 430.

COGS 335. Japanese Linguistics. 3 Units.
The purpose of this course is to survey the principal research in Japanese linguistics for students who have basic knowledge of Japanese and are interested in more in-depth treatment of linguistic phenomena (phonetics, phonology, morphology, syntax, semantics, etc.). Lectures and discussions will cover many different aspects of the Japanese language. There is a great deal of analytic studies of the Japanese language done both inside and outside Japan, which will be surveyed in this course. Students will become familiar with the major issues through lectures and class discussions, as well as through their reading of both primary and secondary sources. Both formal and functional approaches to the analysis of Japanese will be examined, and the acquisition of these structures will also be discussed. The course will also be useful for the improvement of students’ Japanese language proficiency. Recommended preparation: JAPN 101 and JAPN 102, or equivalent competence in Japanese. Offered as COGS 335, COGS 435, JAPN 435, LING 335 and LING 435. Counts for CAS Global & Cultural Diversity Requirement.

COGS 352. Language, Cognition, and Religion. 3 Units.
This course utilizes theoretical approaches found in cognitive semantics—a branch of cognitive linguistics—to study the conceptual structures and meanings of religious language. Cognitive semantics, guided by the notion that conceptual structures are embodied, examines the relationship between conceptual systems and the construction of meaning. We consider such ideas as conceptual metaphor theory, conceptual blending, Image schemas, cross-domain mappings, metonymy, mental spaces, and idealized cognitive models. We apply these ideas to selected Christian, Buddhist, and Chinese religious texts in order to understand ways in which religious language categorizes and conceptualizes the world. We examine both the universality of cognitive linguistic processes and the culturally specific metaphors, conceptual blends, image schemas, and other cognitive operations that particular texts and traditions utilize. Offered as RLGN 352, RLGN 452, COGS 352 and COGS 452. Counts for CAS Global & Cultural Diversity Requirement.

COGS 356. Advanced Topics in Cognitive Neuroscience. 3 Units.
This course focuses on specific areas of research in cognitive neuroscience in some depth. The first half of the semester covers basics and fundamental research areas (e.g., perception, attention) and examines the (sometimes controversial) theoretical issue of what cognitive neuroscience techniques tell us about the mind. The second half of the semester is dedicated to examining selected research topics of interest to students. Students research and write ‘grant proposals’ for cognitive neuroscience experiments. The class culminates with students and invited faculty simulating a funding panel, and deciding which grants to ‘fund’ from a limited budget. Prereq: COGS 102.

COGS 378. Computational Neuroscience. 3 Units.
Computer simulations and mathematical analysis of neurons and neural circuits, and the computational properties of nervous systems. Students are taught a range of models for neurons and neural circuits, and are asked to implement and explore the computational and dynamic properties of these models. The course introduces students to dynamical systems theory for the analysis of neurons and neural learning, models of brain systems, and their relationship to artificial and neural networks. Term project required. Students enrolled in MATH 478 will make arrangements with the instructor to attend additional lectures and complete additional assignments addressing mathematical topics related to the course. Recommended preparation: MATH 223 and MATH 224 or BIOL 300 and BIOL 306. Offered as BIOL 378, COGS 378, MATH 378, BIOL 478, EBME 478, E ECS 478, MATH 478 and NEUR 478.

COGS 381. Philosophy and Cognitive Neuroscience. 3 Units.
This course will focus on the various methodologies used in the cognitive neurosciences, and explore their strengths and weaknesses from scientific and philosophical standpoints. We will begin by examining baseline measures (including IQ tests, tasks of cognitive flexibility, verbal and visual memory, causal/sequential thinking and narrative tasks) and their experimental design. Lesion methods will follow, with an eye toward understanding the strength of inferences that can be drawn from such data. The course will also focus on imaging techniques (CAT, PET, SPECT, fMRI, TMS, etc.) as well as measures of electrical activity such as EEG and single-cell recordings. Students will become familiar with many fundamental assumptions necessary for the implementation of each method, and philosophical questions associated with these endeavors and their potential impact on our knowledge and society. Recommend preparation: PHIL 101 or COGS 201. Offered as COGS 381 and PHIL 381.

COGS 390. Introduction to General Semiotics. 3 Units.
Semiotics, the study of meaning and signs conveying meaning, is a central part of cognitive semiotics, or ‘high level’ cognitive semantics. This discipline is typically taught in departments of linguistics, cognitive science, philosophy, or cultural studies. The domain of semiotics is in fact widely intersecting with other disciplines (general linguistics, philosophy, neuroscience, anthropology, music, literature, architecture, and the arts). Sign theory, text theory, studies of narrative structure, enunciation, natural logic, rhetoric and poetics, speech act forms, are important components in this field.
COGS 391. Introduction to Text Semiotics. 3 Units.
Introduction to Text Semiotics addresses both students of Literature and students in Cognitive Science. Most of the authors included in the reading list extend their linguistic approach towards fields that intersect literature, psychology, philosophy, aesthetics, and anthropology. The scholarly traditions of text analysis and structural theory of meaning, including authors from classical formalism, structuralism, structural semiotics, and new criticism will be connected to cognitive theories of meaning construction in text, discourse, and cultural expressions in general. The focus of this course, taught as a seminar, is on empirical studies, specific text analyses, discourse analyses, speech act analyses, and other studies of speech, writing, and uses of language in cultural contexts. This course thus introduces to a study of literature and cultural expressions based on cognitive science and modern semiotics—the new view that has be coined Cognitive Semiotics. Offered as COGS 391 and WLIT 391.

COGS 397. SAGES Capstone in Cognitive Science. 3 Units.
Supervised original research on a topic in cognitive science, culminating in a public presentation. The research may be in the form of an independent research project, a literature review, or some other form approved by the department. Counts as SAGES Senior Capstone.

This course is for students with special interests and commitments that are not fully addressed in regular courses, and who wish to work independently.

COGS 401. Special Topics in Cognitive Science. 3 Units.
Special Topics in Cognitive Science. Topics vary. Permission of department is required. Offered as COGS 301 and COGS 401.

COGS 402. Advanced Introduction to Cognitive Neuroscience. 3 Units.
This course takes an advanced look at how the methods of cognitive neuroscience can be used to inform theories of cognitive function, with implications for a range of disciplines. Students will be given an overview of methods, brain anatomy, and major findings in the field. In addition, they will read a number of primary source papers. The student may expect to come away from the course with a broad acquaintance with modern cognitive neuroscience, how its findings are relevant to a variety of fields, and how to critically assess primary source material. Cognitive neuroscience is a rapidly evolving field which synthesizes methodologies and conceptual frameworks from numerous different disciplines. No single individual can hope to master all the methods, background knowledge and conceptual systems which are of key importance to the discipline at any one point in time. Cognitive Neuroscience is therefore a group activity, in which progress is critically dependent on group interactions both at a local level (the ‘lab’) and at more distributed levels (the wider scientific/academic community). The key objectives of this introductory course are therefore: 1. To give students a basic overview of current methods in cognitive neuroscience and the current state of knowledge in the field. 2. To enable students to go to, read, understand, research and evaluate the primary literature (i.e. journal articles). 3. To train students in the skills involved in group work, in particular through division of work and integration of acquired knowledge at a local level (i.e. lab-sized group), through effective and clear presentation of work, and through productive interactions with a large community. The first objective will be accomplished through lectures and assigned textbook readings. The second goal will be accomplished through assigned journal article readings. The third goal will be accomplished through a group structured format for accomplishing work, and through ‘journal club’ style presentations to the class.

COGS 406. Theory of Cognitive Linguistics I. 3 Units.
This is the first course in a two-course sequence presenting theory and practice of cognitive linguistics. Offered as COGS 206 and COGS 406.

COGS 407. Cog Linguistics Theory II. 3 Units.
This is the second course in a two-course sequence presenting theory and practice of cognitive linguistics. Offered as COGS 307 and COGS 407. Counts as SAGES Departmental Seminar. Prereq: COGS 406 or consent of instructor.

COGS 408. Advanced Research Workshop I. 3 Units.
This course is an advanced research workshop for undergraduates and MA students. The workshop involves development of research topics (theoretical or empirical), and working on them with the input of other workshop members to produce final papers. Offered as COGS 308 and COGS 408.

COGS 409. Advanced Research Workshop II. 3 Units.
This course is an advanced research workshop for undergraduates and MA students. The workshop involves development of research topics (theoretical or empirical), and working on them with the input of other workshop members to produce final papers. MA students in cognitive linguistics will typically take this course as the second part of a two-part sequence. Offered as COGS 309 and COGS 409.

COGS 410. Cognitive Science of Religion. 3 Units.
This course introduces theories and methods in the cognitive science of religion. Particular emphasis is placed on applying cognitive scientific concepts and theories to such religious issues as belief in deities, religious ritual, and morality. We examine such topics as the relationship of religious studies to evolution and cognition, cognitive theories or religious ritual, anthropomorphism and religious representation, religion as an evolutionary adaptation, and cognitive semantics and religious language. Course work includes student-led discussions, a research-intensive journal-length essay on a topic chosen in consultation with the Instructor, and presentation of research findings to the class. Course readings are taken from the humanities, the social sciences, and natural sciences. Offered as COGS 310, COGS 410, RLGN 310 and RLGN 410.

COGS 411. Mind and Media. 3 Units.
An introduction to the study of mind and media, including the study of multimodal communication. This course investigates patterns of human cognition that are ancient to human beings and upon which media have converged for powerful, immersive effect. The cognitive processes studied include perception, sensation, imagination, joint attention, narrative conception, simulation, dreaming, identity construction, imaginative play, and implicit learning. Students engage in hands-on media analysis to study how basic human mental operations are used in media to achieve a variety of effects. Students will be given access to a private website of instructions, readings, and materials for the course, and will be introduced to a range of vast, rich, searchable databases of media. Students will have ample opportunity to do research inside such databases. Offered as COGS 311 and COGS 411. Counts as SAGES Departmental Seminar.
COGS 412. Second Language Acquisition I. 3 Units.
This course is an introduction to the growing field of second language acquisition (SLA). SLA seeks to understand the linguistic, psychological and social processes that underlie the learning and use of second language(s). The goal of research is to identify the principles and processes that govern second language learning and use. SLA is approached from three perspectives in the course: 1) as linguistic knowledge; 2) as a cognitive skill; and 3) as a socially and personality-mediated process. Important factors in second language learning will be identified and discussed. These include: age-related differences, the influence of the first language, the role played by innate (universal) principles, the role of memory processes, attitudes, motivation, personality and cognitive styles, and formal versus naturalistic learning contexts. The objective of this course is to survey the principal research in second language acquisition. Students will become familiar with the major research issues through their reading of both primary and secondary sources, as well as through lectures and class discussions. Offered as COGS 312, COGS 412, LING 301 and LING 401.

COGS 413. Special Topics in Cognitive Linguistics. 3 Units.
This course covers special topics in the field of cognitive linguistics. Topics will vary from semester to semester. Offered as COGS 313 and COGS 413.

COGS 414. Second Language Acquisition II: Second Language Acquisition Research and Second Language Teaching. 3 Units.
This course will examine various issues in second language acquisition research that are particularly relevant to foreign language teaching and learning. Topics covered will include: the role of input (listening/reading) vs. output (speaking/writing); implicit vs. explicit learning; negative vs. positive evidence (including the role of error correction); affective factors (motivation, anxiety); individual differences; teachability hypothesis and syllabus construction, program design/evaluation, language testing, among others. The purpose of this course is to survey the principal research in the acquisition of second language that is relevant to second language teaching in a classroom setting, and to obtain the state-of-the-art knowledge of the SLA research literature that is relevant to L2 teaching. The focus is not necessarily on the practical application of the SLA research, although we will not exclude discussion of classroom application. Rather, we critically examine and evaluate SLA research and come up with our own syntheses with respect to various issues. To achieve this goal, we should ask following questions in reading and discussing the relevant literature: 1) What are the main claims that the author(s) make(s)? 2) Are the author's claims sound? If not why? 3) What further research is needed to answer remaining questions? Students will become familiar with the major research issues through their reading of both primary and secondary sources, as well as through lectures and class discussions. The students are required to complete a term project that addresses the issues treated in the course. Offered as LING 302, LING 402, COGS 314 and COGS 414. Prereq: COGS 401 or requisites not met permission.

COGS 416. Decision-Making. 3 Units.
This course is a topological introduction to decision-making, a major area of cognitive social science, with connections to economics, law, political science, business, policy, and related fields. Topics include game theory and rational calculation, equilibria, kinds of choice, heuristics, the role of affect in decision, framing, bounded rationality, mechanisms of choice such as heuristics, the role of social cognition in choice, concepts of self and other, and computer modeling of choice. The course also includes an introduction to the design of empirical behavioral research. Offered as COGS 316 and COGS 416. Counts as SAGES Departmental Seminar.

COGS 417. Cognitive Diversity. 3 Units.
This course surveys research from cognitive science (psychology, linguistics, neuroscience, etc.) on the ways that different people think differently. We will consider dimensions such as sex, gender, sexual orientation, race/ethnicity, bodily differences, cultural differences, and effects of speaking different languages. Students will choose the last two topics at the end of the semester (Different religions? Different ages? Whatever interests the class!). Offered as COGS 317 and COGS 417. Counts for CAS Global & Cultural Diversity Requirement.

COGS 419. Elements of Surprise. 3 Units.
This course will connect research into the cognitive experiences of surprise and suspense with the ways people can create those experiences for each other—cooperatively and uncooperatively—in everyday interaction and in cultural products like jokes, architecture, music, written narratives, films, and games. Topics include predictions and expectations involved in perceiving and navigating the world, cognitive biases, timing in conversation, language processing, attention, perspective-taking, counterfactual thinking, the psychological structure of explanations, and the psychology of "fair play." Offered as COGS 319 and COGS 419.

COGS 425. Cognitive Approaches to Literature. 3 Units.
This course approaches literature as a window into language, in which cognition is characterized by the same imaging and imaginary properties as artistic literature. It is an attempt to identify and analyze procedures as aesthetically interesting and generally relevant forms of human thinking, feeling, imagining, fantasizing, and conceptualizing. The course introduces current theories of literature in relation to language and mind, and it presents and discusses practical applications in critical reading and text analysis, using examples from modern literature in the main genres. A student may earn credit for either COGS 325 or COGS 425 but not both. Recommended preparation: COGS 101, COGS 202. Offered as COGS 325 and COGS 425.

COGS 427. Gesture in Cognition and Communication. 3 Units.
Most people never notice that when they are talking, they're also gesturing. Why do we produce these gestures? What can studying them tell us about the human mind? This course surveys scientific research on gesture, exploring topics such as the role of gesture in communication, cross-cultural differences in gesture, and the relationship between gesture and signed languages. The course will focus on gestures produced with speech, but will cover symbolic and ritualized gesture in the visual arts and in dance. Offered as COGS 327, COGS 427 and MLIT 327. Counts as SAGES Departmental Seminar.

COGS 430. Cognition and Computation. 3 Units.
An introduction to (1) theories of the relationship between cognition and computation; (2) computational models of human cognition (e.g. models of decision-making or concept creation); and (3) computational tools for the study of human cognition. All three dimensions involve data science: theories are tested against archives of brain imaging data; models are derived from and tested against datasets of e.g., financial decisions (markets), legal rulings and findings (juries, judges, courts), legislative actions, and healthcare decisions; computational tools aggregate data and operate upon it analytically, for search, recognition, tagging, machine learning, statistical description, and hypothesis testing. Offered as COGS 330, COGS 430, DSCI 330 and DSCI 430.
COGS 435. Japanese Linguistics. 3 Units.
The purpose of this course is to survey the principal research in Japanese linguistics for students who have basic knowledge of Japanese and are interested in more in-depth treatment of linguistic phenomena (phonetics, phonology, morphology, syntax, semantics, etc.). Lectures and discussions will cover many different aspects of the Japanese language. There is a great deal of analytic studies of the Japanese language done both inside and outside Japan, which will be surveyed in this course. Students will become familiar with the major issues through lectures and class discussions, as well as through their reading of both primary and secondary sources. Both formal and functional approaches to the analysis of Japanese will be examined, and the acquisition of these structures will also be discussed. The course will also be useful for the improvement of students' Japanese language proficiency. Recommended preparation: JAPN 101 and JAPN 102, or equivalent competence in Japanese. Offered as COGS 335, COGS 435, JAPN 435, LING 335 and LING 435. Counts for CAS Global & Cultural Diversity Requirement.

COGS 452. Language, Cognition, and Religion. 3 Units.
This course utilizes theoretical approaches found in cognitive semantics—a branch of cognitive linguistics—to study the conceptual structures and meanings of religious language. Cognitive semantics, guided by the notion that conceptual structures are embodied, examines the relationship between conceptual systems and the construction of meaning. We consider such ideas as conceptual metaphor theory, conceptual blending, image schemas, cross-domain mappings, metonymy, mental spaces, and idealized cognitive models. We apply these ideas to selected Christian, Buddhist, and Chinese religious texts in order to understand ways in which religious language categorizes and conceptualizes the world. We examine both the universality of cognitive linguistic processes and the culturally specific metaphors, conceptual blends, image schemas, and other cognitive operations that particular texts and traditions utilize. Offered as RLGN 352, RLGN 452, COGS 352 and COGS 452. Counts for CAS Global & Cultural Diversity Requirement.

COGS 499. Independent Studies. 1 - 3 Units.
This course is a face-to-face seminar between students and instructor, aiming at letting and helping the students independently develop original research on well-defined topics in the field of cognitive linguistics. Themes can vary within the wide area of cognition and culture.

COGS 651. Thesis M.A.. 1 - 6 Units.
Conduct independent research and writing in Cognitive Linguistics under the guidance of a faculty adviser from Cognitive Science. The precise requirements of the course are to be determined by the faculty advisor. Prereq: COGS 406 and COGS 407 and COGS 408. Coreq: COGS 409.