

COGNITIVE SCIENCE (DIV II)

Chair: Professor JOSEPH CRUZ

Advisory Committee: Professors: J. CRUZ, A. DANYLUK, K. KIRBY, H. WILLIAMS***, S. ZAKI. Associate Professor: N. KORNEILL.

Cognitive science is concerned with how humans, non-human animals, and computers acquire, represent, manipulate, and use information. As an interdisciplinary field it combines research and theory from computer science (e.g., artificial intelligence), cognitive psychology, philosophy, linguistics, and neuroscience, and to some extent evolutionary biology, math, and anthropology. Complex issues of cognition are not easily addressed using traditional intra-disciplinary tools. Cognitive researchers in any discipline typically employ a collection of analytic and modeling tools from across traditional disciplinary boundaries. Thus, the methods and research agenda of cognitive science are broader than those of any of the fields that have traditionally contributed to cognitive science. The Cognitive Science Program is designed to provide students with the broad interdisciplinary foundation needed to approach issues of cognition.

THE CONCENTRATION

The concentration in Cognitive Science consists of six courses, including an introductory course, four electives, and a senior seminar. *Minds, Brains, and Intelligent Behavior* (COGS 222) is the entry point into the concentration, and provides an interdisciplinary perspective on issues of cognition. Ideally, it should be taken before the end of the sophomore year. Emphasizing the highly interdisciplinary nature of the field, the four electives must be distributed over at least three course prefixes. In the fall of the senior year, concentrators will participate in a senior seminar (COGS 493).

Required Courses

COGS/PHIL/PSYC 222 *Minds, Brains, and Intelligent Behavior: An Introduction to Cognitive Science*
COGS 493 Senior Seminar

Elective Courses

Four electives are required, chosen from at least three prefixes, at most two of which can be at the 100 level.

BIOL 204/NSCI 204 *Animal Behavior*
CSCI 134 *Introduction to Computer Science*
CSCI 361/MATH 361 *Theory of Computation*
CSCI 373 *Artificial Intelligence*
CSCI 374 *Machine Learning*
JAPN 130 *Intro. to Linguistic Analysis*
NSCI 201/BIOL 212/PSYC 212 *Neuroscience*
PHIL 207 *Contemporary Philosophy of Mind*
PHIL 216/ENVI 216 *Philosophy and Animals*
PHIL 388 *Consciousness*
PSYC 221 *Cognitive Psychology*
PSYC 322 *Concepts: Mind, Brain, and Culture*
PSYC 324 *Great Debates in Cognition*
PSYC 326 *Choice and Decision Making*
PSYC 327 *Cognition and Education*
REL 288/PHIL 288 *Embodiment and Consciousness: A Cross Cultural Exploration*

Recommended Courses

The following courses are recommended for students seeking a richer background in cognitive science. These will not count as electives for the cognitive science concentration.

BIOL 209/NSCI 209 *Animal Communication*
BIOL 305 *Evolution*
MATH 250 *Linear Algebra*
MATH 433 *Mathematical Modeling*
PHIL 209 *Philosophy of Science*
PSYC 201 *Experimentation and Statistics*
STAT 101 *Elementary Statistics and Data Analysis*
STAT 201 *Statistics and Data Analysis*
STAT 231 *Statistical Design of Experiments*

THE DEGREE WITH HONORS IN COGNITIVE SCIENCE

Formal admission to candidacy for honors will occur at the end of the fall semester of the senior year and will be based on promising performance in COGS 493. This program will consist of COGS W31-494(S), and will be supervised by members of the advisory committee from at least two departments. Presentation of a thesis, however, should not be interpreted as a guarantee of a degree with honors.

STUDY ABROAD

Students who wish to discuss plans for study abroad are invited to meet with any member of the Cognitive Science advisory committee. You can find general study away guidelines for Cognitive Science [here](#).

COGS 222(F) *Minds, Brains, and Intelligent Behavior: An Introduction to Cognitive Science*

Crosslistings: COGS 222/PHIL 222/PSYC 222

This course will emphasize interdisciplinary approaches to the study of intelligent systems, both natural and artificial. Cognitive science synthesizes research from cognitive psychology, computer science, linguistics, neuroscience, and contemporary philosophy. Special attention will be given to the philosophical foundations of cognitive science, representation and computation in symbolic and connectionist architectures, concept acquisition, problem solving, perception, language, semantics, reasoning, and artificial intelligence.

Class Format: lecture/discussion

Requirements/Evaluation: midterm and final exams, and self-paced weekly exercises

Prerequisites: PSYC 101 or any introduction to PHIL course or CSCI 134 or permission of instructor; background in more than one of these is recommended

Enrollment Preferences: first-year and sophomore students

Enrollment Limit: 25

Expected Class Size: 25

Dept. Notes: meets Contemporary Metaphysics & Epistemology requirement only if registration is under PHIL

Distributional Requirements:

Division 2

Other Attributes:

PHIL Contemp Metaphysics & Epistemology Courses

PSYC 200-level Courses

Fall 2016

LEC Section: 01 TR 11:20 AM 12:35 PM Instructor: Joseph Cruz

COGS 493(F) Advanced Topics in Mind and Cognition

Crosslistings: COGS 493/PHIL 394

In the last decade the science of the mind has continued to draw on its 20th century history as well as expand its methodological repertoire. In this seminar we will investigate current trends in mind and cognition by considering research in cognitive neuroscience, embodied cognition, dynamic systems theory, and empirical approaches to consciousness. Throughout, we will attend both to the specific empirical details as well as the conceptual foundations of this work. We will discuss how it elaborates, expands, and sharpens early views of the domain and methodology of philosophy of mind and cognitive science.

Class Format: seminar

Requirements/Evaluation: weekly short essays 1000 words, seminar presentation, final paper/project 7,000 words

Extra Info: may not be taken on a pass/fail basis; not available for the fifth course option

Prerequisites: COGS 222 or PSYC 221 or PHIL 207 or permission of program chair

Enrollment Limit: 12

Expected Class Size: 9

Dept. Notes: required of senior cognitive science concentrators, but juniors and seniors from other departments who meet prerequisites are most welcome

Distributional Requirements:

Division 2

Fall 2016

SEM Section: 01 W 01:10 PM 03:50 PM Instructor: Joseph Cruz

COGS 494(S) Senior Thesis: Cognitive Science

The senior concentrator, having completed the senior seminar and with approval from the advisory committee, may devote winter study and the spring semester to a senior thesis based on the fall research project.

Class Format: independent study

Prerequisites: permission of program chair

Distributional Requirements:

Division 2

Spring 2017

HON Section: 01 TBA Instructor: Joseph Cruz

COGS 497(F) Independent Study: Cognitive Science

Cognitive Science independent study.

Class Format: independent study

Prerequisites: permission of program chair

Distributional Requirements:

Division 2

Fall 2016

IND Section: 01 TBA Instructor: Joseph Cruz

COGS 498(S) Independent Study: Cognitive Science

Cognitive Science independent study.

Class Format: independent study

Prerequisites: permission of program chair

Distributional Requirements:

Division 2

Spring 2017

IND Section: 01 TBA Instructor: Joseph Cruz