

# COGNITIVE SCIENCES

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## THE SCHOOL OF SOCIAL SCIENCES

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Eric Margolis

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### **DEGREE OFFERED: BA**

The cognitive sciences provide a multidisciplinary study of the mind. Researchers in this field seek to understand such mental phenomena as perception, thought, memory, the acquisition and use of language, learning, concept formation, and consciousness. Some investigators focus on relations between brain structures and behavior, some work with computer simulation, and others work at more abstract theoretical levels.

### **DEGREE REQUIREMENTS FOR BA IN COGNITIVE SCIENCES**

For general university requirements, see Graduation Requirements (pages 14–15). Students majoring in cognitive sciences must complete 5 core courses and 7 additional courses (see below). Among the 7 additional courses, at least 3 and no more than 4 must be in a single area of concentration—linguistics, philosophy, psychology, or neuroscience.

### **INTRODUCTORY COURSES**

Because the major is interdisciplinary, no single course introduces the full range of the subject. However, students who are interested in majoring in cognitive sciences should take one or more of the following courses during their first and second years: LING200, PHIL103, PSYC101, or PSYC203.

### **HONORS PROGRAM**

Students with a 3.5 GPA in cognitive sciences and 3.3 overall GPA may apply for the cognitive sciences honors program. Students in the honors program are expected to conduct an independent research project of either one or two semesters under the guidance of a member of the cognitive sciences faculty. Students who wish to enter this program should consult with prospective advisors during their junior year and submit a proposal by the end of the semester proceeding the initiation of the project. Typically, this means submitting a proposal by the end of the junior year and beginning the project during the fall of the senior year. Proposal will be

reviewed by both the supervisor and the program director. Students who undertake a two-semester project will be allowed to continue into the second semester only if their advisor judges that sufficient progress has been made during the first semester. At the end of a project, honors students are expected to submit a final paper to both their advisor and the program director and make an oral presentation. For more details, contact the program director.

## INDEPENDENT RESEARCH

Majors may undertake supervised independent research by enrolling in CSCI390 or the honors program, and may apply up to 9 credits of independent research towards the major. Students who wish to take CSCI390 must complete a CSCI390 contract and have it approved by their supervisor and the program director prior to the end of the first week of classes. All students taking CSCI390 must also write a substantive research paper, which is to be submitted to both their advisor and the program director at the end of the semester. (Copies of the contract form and instructions are available on the 'forms' section of the cognitive sciences website.)

### Core Courses

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The core courses are divided into five groups. Majors just take one course from each group.

#### **Computer Science**

CAAM 210 *Introduction to Engineering Computation*

COMP 200 *Elements of Computer Science*

COMP 210 *Introduction to Principles of Scientific Computation*

#### **Psychology**

PSYC 203 *Introduction to Cognitive Psychology*

#### **Linguistics**

LING 200 *Introduction to the Scientific Study of Language*

LING 306 *Language and the Mind*

LING 315 *Semantics*

#### **Philosophy**

PHIL 103 *Philosophical Aspects of Cognitive Science*

PHIL 305 *Mathematical Logic*

PHIL 312 *Philosophy of Mind*

#### **Advanced Psychology**

PSYC 308 *Memory*

PSYC 309 *Psychology of Language*

PSYC 351 *Psychology of Perception*

PSYC 360 *Thinking*

PSYC 362 *Biopsychology*

PSYC 430 *Computational Modeling of Cognitive Processes*

PSYC 432 *Brain and Behavior*

### Additional Courses

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At least 3 and no more than 4 must be in one of the following areas of concentration: linguistics, philosophy, psychology, or neuroscience. Note: you may not use the same courses to fulfill both a core course requirement and an additional course requirement; in other words, no double counting.

#### **Cognitive Sciences**

CCSCI 390 *Supervised Research in Cognitive Science*

CSCI 481 *Honors Project*

CSCI 482 *Honors Project*

#### **Computer Science**

COMP 210 *Introduction to Principles of Scientific Computation*

COMP 212 *Intermediate Programming*

COMP 440 *Artificial Intelligence*

COMP 450 *Algorithmic Robotics*

#### **Linguistics**

LING 200 *Introduction to the Scientific Study of Language*

LING 300 *Linguistic Analysis*

LING 301 *Phonetics*

LING 306 *Language and the Mind*

LING 311 *Phonology*

LING 315 *Semantics*

LING 317 *Language and Computers*

LING 402 *Syntax and Computers*

- LING 403 *Modern Linguistic Theory*  
 LING 404 *Research Methodologies and Linguistic Theories*  
 LING 411 *Neurolinguistics*  
 LING 412 *Language and Intelligence*  
 LING 467 *Computational Projects*  
 LING 490 *Discourse Analysis*

**Neuroscience**

Many of the neuroscience courses are taught by Baylor College of Medicine faculty.

For more information, see  
<http://www.ruf.rice.edu/~neurosci/.BIOS> 421

- BIOS 421 *Neurobiology*  
 CAAM 415 *Theoretical Neuroscience*  
 ELEC 481 *Fundamentals of Systems Physiology and Biophysics*  
 LING 411 *Neurolinguistics*  
 PYSC 362 *Biopsychology*  
 PSYC 432 *Brain and Behavior (formally cross-listed as GSCI 420)*  
 NEUR 500 *Functional Neuroanatomy and Systems Neuroscience*  
 NEUR 501 *Cognitive Neuroscience I*  
 NEUR 502 *Cognitive Neuroscience II*  
 NEUR 503 *Molecular Neuroscience I and II*  
 NEUR 504 *Cellular Neurophysiology I and II*  
 NEUR 505 *Optical Imaging in Neuroscience*  
 NEUR 506 *Learning and Memory*  
 NEUR 511 *Integrative Neuroscience Core Course (first semester)*  
 NEUR 512 *Integrative Neuroscience Core Course (first semester)*  
 NEUR 515 *Neural Development*

**Philosophy**

- PHIL 103 *Philosophical Aspects of Cognitive Science*  
 PHIL 303 *Theory of Knowledge*  
 PHIL 305 *Mathematical Logic*  
 PHIL 312 *Philosophy of Mind*  
 PHIL 353 *Philosophy of Language*  
 PHIL 357 *Incompleteness, Undecidability, and Computability*

**Psychology**

- PSYC 308 *Memory*  
 PSYC 309 *Psychology of Language*  
 PSYC 340 *Research Methods*  
 PSYC 351 *Psychology of Perception*  
 PSYC 352 *Formal Foundations of Cognitive Science*  
 PSYC 360 *Thinking*  
 PSYC 362 *Biopsychology*  
 PSYC 370 *Introduction to Human Factors*  
 PSYC 409 *Methods in Human-Computer Interaction*  
 PSYC 411 *History of Psychology*  
 PSYC 430 *Computational Modeling of Cognitive Processes*  
 PSYC 432 *Brain and Behavior (formally cross-listed as GSCI 420)*  
 PSYC 441 *Human-Computer Interaction*  
 PSYC 465 *Olfactory Perception*

**Other**

- ANTH 406 *Cognitive Studies in Anthropology and Linguistics*  
 ELEC 201 *An Introduction to Engineering Design*  
 ELEC 498 *Introduction to Robotics*  
 STAT 300 *Model Building*