

## COGNITIVE SCIENCE

### Cognitive Science

College of Arts and Humanities  
Department of Philosophy  
227 Armstrong Hall • 507-389-2012

Cognitive Science Program Director: Richard Liebendorfer.

Biology Concentration Advisor: Geoffrey Goellner  
Computer Science Concentration Advisor: Rebecca Bates  
Philosophy Concentration Advisor: Richard Liebendorfer  
Psychology Concentration Advisor: Dawn Albertson  
Cognitive Science Program Core Faculty: Dawn Albertson (Psychology) Rebecca Bates (Computer Science), Michael Bentley (Biology), Sun Yu (Philosophy), Richard Liebendorfer (Philosophy), Geoffrey Goellner (Biology), Daniel Toma (Biology), Karla Lassonde (Psychology), Moses Langley (Psychology), Guarionex Salivia (Cognitive Science).

Cognitive Science is an interdisciplinary inquiry concerned with understanding the nature and development of such intelligent capacities as perception, language, reasoning, learning and problem-solving, whether these capacities are realized in biological or artificial systems. Such inquiry is by its very nature interdisciplinary, integrating methodological, theoretical and practical foci of Biology, Computer Science, Philosophy and Psychology into a single course of study.

#### POLICIES/INFORMATION

The cognitive science major is a broad major and does not require that a student complete a minor in addition to the major. The major requires approximately 71-79 credits (depending on area of concentration) including prerequisites. As prerequisites for the major students must take CHEM 201, MATH 115 **OR** MATH 121, PSYC 201, **OR** STAT 354. Some of prerequisite requirements also fulfill General Education goal areas. Some of the concentrations have additional prerequisites (see course descriptions for more information). The program requirements below should be read carefully.

Each Cognitive Science major will concentrate in one of the four participating disciplines: Biology, Computer Science, Philosophy and Psychology. The concentration typically requires 24 credits of work. In addition to the concentration each student will take core courses from each of the other three participating disciplines. Each core will typically require 12 credits of course work, a total of 36 credits. A student need not do the core for her or his area of concentration since the core is already included in the concentration.

The structure of the major insures that students have a solid grounding in each of the four disciplines as well as a specific concentration in one area that draws on the interdisciplinary foundation. Graduates of the program will be prepared for a variety of post-baccalaureate options.

- They will be prepared for any of the careers open to graduates with degrees in one of the participating disciplines.
- They will be prepared for graduate study in traditional programs in Biology, Computer Science, Psychology or Philosophy.
- They will also be prepared for study in one of the many recently developed graduate Cognitive Science programs as well as graduate study in related programs such as cognition, brain, and behavior, cognitive neuroscience, biopsychology and human-computer interaction.

Those who choose to study the law, a path frequently chosen by philosophy majors, will be well suited for legal practice concerned with the variety of legal complexities associated with the development of new technology.

**Admission to the major** is granted by the Cognitive Science Program. Minimum admission requirements are:

- a minimum of 32 earned semester hours.
- a minimum cumulative GPA of 2.5

Contact the Cognitive Science Program Director or the Program Advisors in one of the four participating departments.

**Grading Policy.** All coursework applied towards the major must be taken for a letter grade except for courses offered only as P/N. A minimum grade of "C-" is required in all courses which are to be applied towards the major. In addition, a minimum grade of "C-" is required for all prerequisite courses where dictated by individual department policies. Grades of "D" are not accepted by the program for pre-requisites to the major, major common core and major restricted elective courses.

#### COGNITIVE SCIENCE BS

Degree completion = 120 credits

#### **Required General Education**

CHEM 201 General Chemistry I (5)  
MATH 121 Calculus I (4)

#### **Prerequisites to the Major** (choose 3-4 credits)

PSYC 201 Statistics for Psychology (4)  
STAT 354 Concepts of Probability & Statistics (3)

#### **Major Common Core**

(choose one emphasis and three core elective clusters)

#### **Major Restricted Electives**

(choose three of the core elective groups other than your major emphasis)

##### Core Elective: Biology (choose 11 credits)

BIOL 220 Human Anatomy (4)  
BIOL 324 Neurobiology (3)  
BIOL 330 Principles of Human Physiology (4)

##### Core Elective: Computer Science

(choose 3-4 credits)  
CS 315 Introduction to Cryptographic Methods (4)  
CS 330 Introduction to Neural Computation (4)  
CS 430 Artificial Intelligence (3)  
IT 482 Human Computer Interaction (4)  
Required (choose 12 credits)  
CS 110 Computer Science I (4)  
CS 111 Computer Science II (4)  
CS 230 Introduction to Intelligent Systems (4)

##### Core Elective: Philosophy

Required (choose 12 credits)  
PHIL 101W Philosophical Problem: The Mind-Body Problem (3)  
Electives (choose 9 credits)  
PHIL 410 Philosophy of Language (3)  
PHIL 474 Philosophy of the Mind (3)  
PHIL 475 Philosophical Issues in Cognitive Science (3)  
PHIL 480 Philosophy of Science (3)  
PHIL 481 Philosophy of Biology (3)

##### Core Elective: Psychology

Required (choose 12 credits)  
PSYC 101 Introduction to Psychological Science (4)  
PSYC 325 Introduction to Cognitive Psychology (4)  
Electives (choose 4 credits)  
PSYC 413 Sensation & Perception (4)  
PSYC 415 Human Memory (4)  
PSYC 421 Behavior Neuroscience (4)



## COGNITIVE SCIENCE CONTINUED

### Major Emphasis: Biology

BIOL	105	General Biology I (4)
BIOL	106	General Biology II (4)
BIOL	220	Human Anatomy (4)
BIOL	324	Neurobiology (3)
BIOL	330	Principles of Human Physiology (4)

(choose 6-8 credits)

BIOL	211	Genetics (4)
BIOL	424	Developmental Biology (3)
BIOL	436	Animal Behavior (4)
BIOL	438	General Endocrinology (3)
BIOL	460	Introduction to Toxicology (3)
BIOL	466	Principles of Pharmacology (3)

### Major Emphasis: Computer Science

CS	110	Computer Science I (4)
CS	111	Computer Science II (4)
CS	230	Introduction to Intelligent Systems (4)
CS	305	Algorithmic Structures (4)
CS	498	Senior Thesis (4)

(choose 3-4 credits)

CS	315	Introduction to Cryptographic Methods (4)
CS	330	Introduction to Neural Computation (4)
CS	430	Artificial Intelligence (3)

### Major Emphasis: Philosophy

PHIL	101W	Philosophical Problem: The Mind-Body Problem (3)
PHIL	495	Senior Thesis I (2)
PHIL	496	Senior Thesis II (1)

(choose 9 credits)

PHIL	311	Symbolic Logic (3)
PHIL	410	Philosophy of Language (3)
PHIL	474	Philosophy of the Mind (3)
PHIL	475	Philosophical Issues in Cognitive Science (3)
PHIL	480	Philosophy of Science (3)
PHIL	481	Philosophy of Biology (3)

Choose courses which have not already been chosen under the preceding requirement. (choose 9 credits)

PHIL	311	Symbolic Logic (3)
PHIL	334W	History of Philosophy: Classical Philosophy (3)
PHIL	336W	History of Philosophy: Renaissance and Modern Philosophy (3)
PHIL	410	Philosophy of Language (3)
PHIL	420	Epistemology (3)
PHIL	430	Metaphysics (3)
PHIL	437	Contemporary Philosophy (3)
PHIL	450	Special Topics (1-3)
PHIL	455	Existentialism & Phenomenology (3)
PHIL	474	Philosophy of the Mind (3)
PHIL	475	Philosophical Issues in Cognitive Science (3)
PHIL	480	Philosophy of Science (3)
PHIL	481	Philosophy of Biology (3)

### Major Emphasis: Psychology

PSYC	101	Introduction to Psychological Science (4)
PSYC	325	Introduction to Cognitive Psychology (4)

(choose 16 credits)

PSYC	206	The Human Mind (4)
PSYC	321	Brain and Behavior (4)
PSYC	405	Motivation (4)
PSYC	413	Sensation & Perception (4)
PSYC	415	Human Memory (4)
PSYC	420	Psychopharmacology (4)
PSYC	421	Behavior Neuroscience (4)
PSYC	423	Cognitive Neuroscience (4)
PSYC	430	Advanced Topics in Biological Psychology (4)
PSYC	433	Child Psychology (4)
PSYC	436	Adolescent Psychology (4)
PSYC	455	Abnormal Psychology (4)
PSYC	458	Cultural Psychology (4)
PSYC	466	Psychology of Aging (4)

**Required Minor: None.**