Areas of Specialization

The Department of Cognitive Science has instituted optional "areas of specialization" within the Cognitive Science major for the BS degree only.

The areas of specialization are intended to provide majors with guidance in choosing elective courses and to make the specific interests and training of a major clear to prospective employers and graduate schools. Specifying an area of specialization is optional; however, students should take into consideration that approved courses are not necessarily offered every year, when planning for their specialization.

To major in Cognitive Science with an area of specialization, student must fulfill the requirements for the BS degree and must choose 4 of the required 6 electives from the list of approved electives for that area of specialization. In addition, a Cognitive Science 199 may be allowed for elective credit within the specialization if the research project was clearly in one of the specialization areas. The specialization area will be listed on the transcript.

NEUROSCIENCE SPECIALIZATION

Major code: CG29

This area of specialization is intended for majors interested in neuroscience research or medicine. Allowed electives include courses in cognitive neuroscience, organic chemistry, biochemistry, and physiology.

Cognitive Science
CGGS 119: Programming/Experimental Res.
CGGS 143: Animal Cognition
CGGS 154: Comm. Disorders Child/Adults
CGGS 169: Sem. Special Topics (if topic applies)
CGGS 163: Metabolic Disorders of the Brain
CGGS 164: Neurobiology of Motivation
CGGS 171: Mirror neuron System
CGGS 172: Brain Disorders and Cognition
CGGS 173: Drugs: Brain, Mind, and Culture
CGGS 175: Neurology / States of Consciousness
CGGS 176: From Sleep to Attention
CGGS 177: Space and Time in the Brain
CGGS 179: Electrophysiology of Cognition
CGGS 180: Neural Coding/Sensory Systems
CGGS 184: Modeling the Evolution of Cognition
Plus any CGGS 107 not used for core sequence

Biochemistry
BIBC 100: Structural Biochemistry
BIBC 102: Metabolic Biochemistry

Biology-Animal Physiology and Neuroscience
BIPN 100: Mammalian Physiology I
BIPN 105: Animal Physiology Lab
BIPN 144: Developmental Neurobiology
BIPN 146: Computational Neurobiology
BIPN 148: Cellular Basis of Learning and Memory

Chemistry
CHEM 140A: Organic Chemistry
CHEM 140B: Organic Chemistry
CHEM 140C: Organic Chemistry
CHEM 141A: Organic Chemistry
CHEM 141B: Organic Chemistry
CHEM 143A: Organic Chemistry Laboratory
CHEM 143B: Organic Chemistry Laboratory
CHEM 143C: Organic Chemistry Laboratory

Linguistics
LIGN 172: Language and the Brain

Psychology
PSYC 168: Psych. Disorders of Childhood
PSYC 169: Brain Damg and Ment. Func.
PSYC 179: Drugs, Addts., & Ment. Desc.
PSYC 181: Drugs and Behavior
PSYC 182: Illusions and the Brain

MACHINE LEARNING AND NEURALCOMPUTATION SPECIALIZATION

Major code: CG27

This area of specialization is intended for majors interested in software engineering or research in computational modeling of cognition. Allowed electives include advanced courses in neural networks, artificial intelligence, and computer science.

Cognitive Science
CGGS 102C: Cognitive Engineering
CGGS 118A: Natural Computation I
CGGS 118B: Natural Computation II
CGGS 121: HDI Programming
CGGS 160: Sem. Special Topics (if topic applies)
CGGS 171: Mirror neuron System
CGGS 180: Neural Coding/Sensory Systems
CGGS 181: Nat. Models of Cog.
CGGS 185: Adv. Machine Learning Methods
CGGS 187A: Multimedia Design I
CGGS 187B: Multimedia Design II
CGGS 188: AI Algorithm and Social Language
CGGS 189: Brain Computer Interfaces

Biology-Animal Physiology and Neuroscience
BIPN 146: Computational Neurobiology

Computer Science and Engineering*
CSE 100: Advanced Data Structures
CSE 101: Design and Analysis of Algorithms
CSE 105: Theory of Computability
CSE 102: Storage System Architectures
CSE 130: Program Lang. Prin. and Paradigms
CSE 131: Compiler Construction
CSE 150: Intro to AI: Search and Reasoning
CSE 151: Intro to AI: Statistical Approaches
CSE 160: Intro to Parallel Computation

Math
MATH 170A: Numerical/Linear Algebra
MATH 170B: Numerical/Approx + Nonlinear
MATH 170C: Numerical/Differential Equations
MATH 180A: Introduction to Probability
MATH 180B: Intro. to Stochastic Processes I
MATH 180C: Intro. to Stochastic Processes II
MATH 189: Exploratory Data Analysis/Inference

*We cannot guarantee these courses forCog Sci majors as many of these courses are very impacted. Also, CSE 102, and 160 may not be offered on a regular basis.

LANGUAGE AND CULTURE SPECIALIZATION

Major Code: CG28

This area of specialization is intended for majors whose primary interests include human psychology and applications of cognitive science in design and engineering. Allowed electives include courses in cognitive development, language, laboratory research of cognition, anthropology and sociology.

Cognitive Science
CGGS 110: The Developing Mind
CGGS 112: Child Language Acquisition
CGGS 118B: Real-time Exam. of Lang. Process.
CGGS 119: Programming/Experimental Res.
CGGS 143: Animal Cognition
CGGS 151: Analog and Conceptual Systems
CGGS 152: Cognitive Foundations of Math
CGGS 153: Language Comprehension
CGGS 154: Comm. Disorders Child/Adults
CGGS 155: Gesture and Cognition
CGGS 156: Language Development
CGGS 157: Music and the Mind
CGGS 160: Sem. Special Topics (if topic applies)
CGGS 171: Mirror neuron System
Plus CGGS 102A or 102B when not used for core sequence

Linguistics
LIGN 155: Evolution of Language
LIGN 170: Psycholinguistics
LIGN 171: Child Language Acquisition
LIGN 174: Gender and Language in Society
LIGN 175: Sociolinguistics
LIGN 180: Language Representation in the Brain
LIGN 181: Language Processing in the Brain

Psychology
PSYC 115: Lab in Cognitive Psychology
PSYC 118B: Real-time Exam. of Lang. Process.
PSYC 119: Psycholinguistics/Cognition Lab

Sociology
SOCI 116: Gender and Language in Society
SOCI 118E: Sociology of Language

*student can take either LIGN 174 or SOCI 116 but not both