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.
- 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.
- At least 3 of your 6 total electives must be taken within the Cognitive Science Department (COGS courses).

### Neuroscience Specialization

<table>
<thead>
<tr>
<th>Major code: CG29</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

- Cognitive Science
  - COGS 115: Neuro, Dev. and Cog. Change
  - COGS 119: Programming/Experimental Res.
  - COGS 143: Animal Cognition
- COGS 154: Comm. Disorders Child/Adults
- COGS 160: Sem Special Topics (if topic applies)
- COGS 163: Metabolic Disorders of the Brain
- COGS 164: Neurobiology of Motivation
- COGS 170: Nat/Art Syn. Resp. Systems
- COGS 171: Mirror neuron System
- COGS 172: Brain Disorders and Cognition
- COGS 174: Drugs: Brain, Mind, and Culture
- COGS 175: Neuropsychological / States of Consciousness
- COGS 176: From Sleep to Attention
- COGS 177: Space and Time in the Brain
- COGS 179: Electrophysiology of Cognition
- COGS 183: Neural Coding/Sensory Systems
- COGS 184: Modeling the Evolution of Cognition

**Plus any COGS 107 not used for core sequence**

### Machine Learning and Neural Computation Specialization

<table>
<thead>
<tr>
<th>Major code: CG27</th>
</tr>
</thead>
<tbody>
<tr>
<td>This area of specialization is intended for majors interested in computational and mathematical approaches to modeling cognition or building cognitive systems, theoretical neuroscience, as well as software engineering and data science. Allowed electives include advanced courses in neural networks, artificial intelligence, and computer science.</td>
</tr>
</tbody>
</table>

- Cognitive Science
  - COGS 118A: Natural Computation I *
  - COGS 118B: Natural Computation II *
  - COGS 118C: Neural Signal Processing *
  - COGS 118D: Math. Stat. for Behavioral Data Analysis *
  - COGS 118O: Sem Special Topics (if topic applies)
- COGS 190: Neural Coding/Sensory Systems
- COGS 198: AI Algorithm and Social Language
- COGS 199: Brain Computer Interfaces

### Language and Culture Specialization

<table>
<thead>
<tr>
<th>Major Code: CG28</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

- Cognitive Science
  - COGS 110: The Developing Mind
  - COGS 115: Neuro, Dev. and Cog. Change
  - COGS 119: Programming/Experimental Research
  - COGS 143: Animal Cognition
- COGS 151: Analytic and Conceptual Systems
- COGS 152: Cognitive Foundations of Math
- COGS 153: Language Comprehension
- COGS 154: Comm. Disorders Child/Adults
- COGS 155: Gesture and Cognition
- COGS 156: Language Development
- COGS 157: Music and the Mind
- COGS 160: Sem Special Topics (if topic applies)
- COGS 171: Mirror neuron System

**Plus COGS 102A or 102B when not used for core sequence**

### Biology-Animal Physiology and Neuroscience

**Plus COGS 102A or 102B when not used for core sequence**
CLINICAL ASPECTS of COGNITION SPECIALIZATION
Major Code: CG31

This area of specialization is intended for majors interested in cognitive neuropsychology, psychiatry, cognitive disorders, and the effects of drugs and brain damage on cognitive functions. Allowed electives include courses in those topics, as well as organic chemistry, biochemistry and physiology.

Cognitive Science
CGOS 154: Communication Disorders in Children + Adults
CGOS 163: Metabolic Disorders of the Brain
CGOS 171: Minor neuron System
CGOS 172: Brain Disorders and Cognition
CGOS 174: Drugs: Brain, Mind and Culture
CGOS 175: The Neuropsychological Basis of Alternate States of Consciousness
CGOS 176: From Sleep to Attention

Biochemistry
BIBC 100: Structural Biochemistry
BIBC 102: Metabolic Biochemistry

Biology-Animal Physiology and Neuroscience
BIPN 100: Mammalian Physiology I
BIPN 105: Animal Physiology Lab

Chemistry
CHEM 140A: Organic Chemistry I
CHEM 140B: Organic Chemistry II

Psychology
PSYC 100: Clinical Psychology
PSYC 116: Lab in Clinical Psychology Research
PSYC 120: Learning and Motivation
PSYC 125: Clinical Neuropsychology Assessment
PSYC 124: Introduction to Clinical Psychology
PSYC 134: Eating Disorders
PSYC 140L: Lab/Human Behavior
PSYC 154: Behavior Modification
PSYC 155: Social Psychology and Medicine
PSYC 168: Psych, Disorders of Childhood
PSYC 169: Brain Damage and Mental Functions
PSYC 170: Cognitive Neuropsychology
PSYC 179: Drugs, Addiction, Mental Disorders
PSYC 181: Drugs and Behavior
PSYC 188: Impulse Control Disorders

DESIGN AND INTERACTION SPECIALIZATION
Major Code: CG30

This area of specialization is intended for majors interested in human computer interaction, web, visualization, and applications of cognitive science in design and engineering. Additional electives may be petitioned from communication, computer science, computer engineering and visual arts. Please note: We cannot guarantee enrollment in non-COGS courses (i.e., CSE, ECE, ICAM) for HCI students since many of these majors are very impacted and priority is given to students in those majors.

Cognitive Science
COGS 119: Programming/Experimental Res.
COGS 120: Human Computer Interaction
COGS 121: HCI Programming
COGS 160: Sem Special Topics (If topic applies)
COGS 187A: Cognitive Aspects of Multimedia Design
COGS 187B: Cognitive Aspects of Multimedia Design II
COGS 188: AI Algorithm & Social Language
COGS 189: Brain Computer Interfaces
Plus any COGS 102 not used for core sequence

Communication
COMM 101E: Media Production Lab
Ethnographic Methods for Media Production
COMM 101M: Media Production Lab: Communicating and Computers
Communicating and Computers
COMM 102C: Practicum in New Media & Community Life
COMM 105G: Computer Games Studies
COMM 109E: Internet Industry
COMM 110T: LLC, Language, Thought & Media
COMM 111D: Critical Design
COMM 112M: Communication and Social Machines
COMM 120N: Advanced Media Production: News Media Workshop
COMM 151: The Information Age: In Fact and Fiction
COMM 172: Adv. Studies in Mediation and Interaction
COMM 173: Interaction with Technology

Computing and the Arts
ICAM 101: Digital Imaging: Image and Interactivity
ICAM 102: Digital Media I: Time, Movement, Sound
ICAM 120: Virtual Environments
ICAM 130: Seminar in Contemporary Computer Topics

Computer Science
CSE 100: Advanced Data Structures
CSE 101: Design and Analysis of Algorithms
CSE 102: Storage System Architectures
CSE 111: Object Oriented Software Design
CSE 118: Ubiquitous Computing
CSE 130: Programming Lang: Principles and Paradigms
CSE 132A: Database System Principles
CSE 132B: Database Systems Applications
CSE 133: Information Retrieval
CSE 134A: Web Server Languages
CSE 134B: Web Client Languages
CSE 135: Server-side Web Applications
CSE 150: Introduction to Artificial Intelligence: Search and Reasoning
CSE 151: Introduction to Artificial Intelligence: Statistical Approaches
CSE 152: Intro Computer Vision
CSE 167: Computer Graphics
CSE 171: User Interface Design

Electrical and Computer Engineering
ECE 161A: Introduction to Digital Signal Processing
ECE 161B: Digital Signal Processing I
ECE 161C: Applications of Digital Signal Processing
ECE 172A: Introduction to Intelligent Systems: Robotics and Machine Intelligence
ECE 187: Introduction to Biomedical Imaging and Sensing

Engineering
ENG 100D: Design for Development

Philosophy
PHIL 164: Technology and Human Values

Psychology
PSYC 161F: Introduction to Engineering Psychology

Visual Arts
VIS 140: Digital Imaging: Image and Interactivity
VIS 145A: Digital Media I: Time, Movement, Sound
VIS 145B: Time- and Process-Based Digital Media II
VIS 147A: Electronic Technologies for Art I
VIS 147B: Electronic Technologies for Art II
VIS 149: Seminar in Contemporary Computer Topics
VIS 176: 16mm Filmmaking
VIS 177: Scripting Strategies
VIS 180A: Documentary Evidence and the Construction of Authenticity in Current Media Practices
VIS 180B: Fiction and Allegory in Current Media Practices
VIS 182: Advanced Editing
VIS 188: Advanced Filmmaking Strategies

(updated 10/9/16)