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**
COGS 119: Programming/Experimental Res.
COGS 143: Animal Cognition
COGS 154: Comm. Disorders Child/Adults
COGS 160: Sem Special Topics (if topic applies)
COGS 170: Nat/Art Sym. Rep. Systems
COGS 171: Mirror neuron System
COGS 172: Brain Disorders and Cognition
COGS 174: Drugs: Brain, Mind, and Culture
COGS 175: Neurophy/States of Consciousness
COGS 176: From Sleep to Attention
COGS 177: Space and Time in the Brain
COGS 179: Electrophysiology of Cognition
COGS 180: Neural Coding/Sensory Systems
COGS 184: Modeling the Evolution of Cognition
Plus any COGS 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

**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 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, Adds., & Ment. Disorder
PSYC 181: Drugs and Behavior
PSYC 182: Illusions and the Brain

**COMPUTATION 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**
COGS 102C: Cognitive Engineering
COGS 118A: Natural Computation I
COGS 118B: Natural Computation II
COGS 119: Programming/Experimental Res.
COGS 121: HCI Programming
COGS 160: Sem Special Topics (if topic applies)
COGS 171: Mirror neuron System
COGS 180: Neural Coding/Sensory Systems
COGS 185: Adv. Machine Learning Methods
COGS 187A: Multimedia Design I
COGS 187B: Multimedia Design II
COGS 189: Brain Computer Interfaces

**Bioinformatics**
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

**Linguistics**
LIGN 170: Psycholinguistics
LIGN 171: Child Lang 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
<table>
<thead>
<tr>
<th>Major Code: CG31</th>
<th>Major Code: CG30</th>
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</thead>
<tbody>
<tr>
<td><strong>Clinical Aspects of Cognition Specialization</strong></td>
<td><strong>Human-Computer Interaction Specialization</strong></td>
</tr>
<tr>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td><strong>Cognitive Science</strong></td>
<td><strong>Cognitive Science</strong></td>
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<tr>
<td>COGS 154: Communication Disorders in Children and Adults</td>
<td>COGS 119: Programming/Experimental Res.</td>
</tr>
<tr>
<td>COGS 171: Mirror neuron System</td>
<td>COGS 120: Human Computer Interaction</td>
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<tr>
<td>COGS 172: Brain Disorders and Cognition</td>
<td>COGS 121: HCI Programming</td>
</tr>
<tr>
<td>COGS 174: Drugs: Brain, Mind and Culture</td>
<td>COGS 160: Sem Special Topics (if topic applies)</td>
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<tr>
<td>COGS 175: The Neuropsychological Basis of Alternate States of Consciousness</td>
<td>COGS 171: Mirror neuron System</td>
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<tr>
<td>COGS 176: From Sleep to Attention</td>
<td>COGS 183: Artificial Life</td>
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<tr>
<td><strong>Biochemistry</strong></td>
<td><strong>Communication</strong></td>
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<tr>
<td>BBC 100: Structural Biochemistry</td>
<td>COMM 101E: Media Production Lab: Ethnographic Methods for Media Production</td>
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<tr>
<td>BBC 102: Metabolic Biochemistry</td>
<td>COMM 101M: Media Production Lab: Communicating and Computers</td>
</tr>
<tr>
<td><strong>Biology-Animal Physiology and Neuroscience</strong></td>
<td>COMM 102C: Practicum in New Media &amp; Community Life</td>
</tr>
<tr>
<td>BIPN 100: Mammalian Physiology I</td>
<td>COMM 105G: Computer Games Studies</td>
</tr>
<tr>
<td>BIPN 105: Animal Physiology Lab</td>
<td>COMM 106I: Internet Industry</td>
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<tr>
<td><strong>Chemistry</strong></td>
<td>COMM 110T: Language, Literacy and Communication: Language, Thought, and the Media</td>
</tr>
<tr>
<td>CHEM 140A: Organic Chemistry I</td>
<td>COMM 111D: Critical Design</td>
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<tr>
<td>CHEM 140B: Organic Chemistry II</td>
<td>COMM 112M: Communication and Social Machines</td>
</tr>
<tr>
<td>CHEM 141A: Organic Chemistry</td>
<td>COMM 112T: Interaction with Technology</td>
</tr>
<tr>
<td>CHEM 141B: Organic Chemistry</td>
<td><strong>Computing and the Arts</strong></td>
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<tr>
<td><strong>Psychology</strong></td>
<td>ICAM 101: Digital Imaging: Image and Interactivity</td>
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<tr>
<td>PSYC 120: Learning and Motivation</td>
<td>ICAM 102: Digital Media I: Time, Movement, Sound</td>
</tr>
<tr>
<td>PSYC 125: Clinical Neuropsychology Assessment</td>
<td>ICAM 120: Virtual Environments</td>
</tr>
<tr>
<td>PSYC 124: Introduction to Clinical Psychology</td>
<td>ICAM 130: Seminar in Contemporary Computing Topics</td>
</tr>
<tr>
<td>PSYC 140: Lab/Human Behavior</td>
<td><strong>Computer Science</strong></td>
</tr>
<tr>
<td>PSYC 163: Abnormal Psychology</td>
<td>CSE 100: Advanced Data Structures</td>
</tr>
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<td>PSYC 168: Psych, Disorders of Childhood</td>
<td>CSE 101: Design and Analysis of Algorithms</td>
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<td>PSYC 169: Brain Damage and Mental Functions</td>
<td>CSE 102: Storage System Architectures</td>
</tr>
<tr>
<td>PSYC 179: Drugs, Addiction, Mental Disorders</td>
<td>CSE 111: Object Oriented Software Design</td>
</tr>
<tr>
<td>PSYC 181: Drugs and Behavior</td>
<td>CSE 118: Ubiquitous Computing</td>
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<tr>
<td>PSYC 188: Impulse Control Disorders</td>
<td>CSE 130: Programming Lang: Principles and Paradigms</td>
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</tbody>
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*Note: both ENG100A/100L must be taken together to receive credit. Student can take either ENG100A/100L or Cogs 199 but not both.*