Areas of Specialization

The Department of Cognitive Science offers 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.

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

A COGS 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.

Cognitive Science Department
University of California San Diego
9500 Gilman Drive, MC 0515
La Jolla, CA 92039-0515

Phone: (858) 534-6775
Email: cogsciadvising@ucsd.edu
Website: cogsci.ucsd.edu
Location: Cognitive Science Building / Room 139

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 163: Metabolic Disorders of the Brain
COGS 164: Neurobiology of Motivation
COGS 169: Genetic Information for Behavior
COGS 170: Brain Waves Across Scales
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 178: Genes, Brains, and Behavior
COGS 179: Electrophysiology of Cognition
COGS 180: Decision Making in the Brain
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: Human 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 143B: Organic Chemistry Laboratory
CHEM 143C: Organic Chemistry Laboratory

Linguistics
LIGN 180: Language Representation in the Brain
LIGN 181: Language Processing in the Brain

Psychology
PSYC 123: Cognitive Control and Frontal Lobe Function
PSYC 132: Hormones and Behavior
PSYC 133: Circadian Rhythms – Biological Clock
PSYC 150: Cognitive Neuroscience of Vision
PSYC 168: Psych. Disorders of Childhood
PSYC 169: Brain Damg and Ment. Func.
PSYC 174: Visual Cognition
PSYC 179: Drugs, Add., & Ment. Disorder.
PSYC 181: Drugs and Behavior
PSYC 182: Illusions and the Brain

MACHINE LEARNING AND NEURAL COMPUTATION SPECIALIZATION
Major code: CG35

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.

Cognitive Science
COGS 109: Modeling and Data Analysis
COGS 118A: Intro to Machine Learning I *
COGS 118B: Intro to Machine Learning II *
COGS 118C: Neural Signal Processing *
COGS 118D: Math. Stat. for Behavioral Data Analysis *
COGS 160: Sem Special Topics (if topic applies)
COGS 180: Modeling the Evolution of Cognition
COGS 185: Adv. Machine Learning Methods
COGS 188: Artificial Intelligence Algorithms
COGS 189: Brain Computer Interfaces

Bio-Behavioral Psychology and Neuroscience
BIPN 146: Computational Neurobiology

Computer Science and Engineering*
CSE 100: Advanced Data Structures
CSE 101: Design and Analysis of Algorithms
CSE 102: Storage System Architectures
CSE 105: Theory of Computational Complexity
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

Linguistics
LIGN 167: Deep Learning for Nat. Lang. Understanding

Math
MATH 170A: Intro to Numerical Analysis: Linear Algebra
MATH 170B: Intro to Numerical Analysis.Approx.:Non Lin. Eq.
MATH 170C: as well as Numerical Analysis: Ordinary, Diff. Eq.
MATH 180A: Introduction to Probability
MATH 180B: Intro. to Stochastic Processes I
MATH 180C: Intro. to Stochastic Processes II
MATH 189: Exploratory Data Analysis and Inference

Cross-Campus Online
CMN 150V: Computational Social Science (UC Davis)
CMPE 107: Prob/Stats for Engineers (UC Santa Cruz)
Visit crossenroll.universityofcalifornia.edu to enroll

Language and Culture Specialization
Major Code: CG34

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
COGS 110: The Developing Mind
COGS 119: Programming/Experimental Research
COGS 143: Animal Cognition
COGS 144: Social Cognition
COGS 151: Analogy 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

Linguistics
LIGN 148: Psycholinguistics of Sign Language
LIGN 155: Evolution of Language
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 115A: Lab in Cognitive Psychology I
PSYC 115B: Lab in Cognitive Psychology II
PSYC 128: Psychology of Reading
PSYC 145: Psychology of Language
PSYC 156: Cognitive Development in Infancy

Sociology
SOCI 116: Gender and Language in Society *
SOCI 117: Language, Culture, and Education
SOCI 118E: Sociology of Language

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

Students specializing in Machine Learning and Neural Computation must choose 2 electives from: COGS 118A-B-C-D. These courses require MATH 20C-E, 18, 180A, and COGS 18 or CSE 11 as prerequisites. ** We cannot guarantee these courses for CogSci majors as many CSE courses are very impacted.
<table>
<thead>
<tr>
<th>CLINICAL ASPECTS of COGNITION SPECIALIZATION</th>
<th>DESIGN AND INTERACTION SPECIALIZATION</th>
<th>Computing and the Arts</th>
<th>Psychology</th>
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</thead>
<tbody>
<tr>
<td>Major Code: CG31</td>
<td>Major Code: CG33</td>
<td>VIS 143: Virtual Environments</td>
<td>PSYC 161: Engineering Psychology</td>
</tr>
<tr>
<td>This area of specialization is intended for majors interested in cognitive neuroscience, 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>
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<tr>
<td>Cognitive Science</td>
<td>Cognitive Science</td>
<td>Computer Science</td>
<td>Visual Arts</td>
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<tr>
<td>COGS 154: Communication Disorders in Children + Adults</td>
<td>COGS 102A: Cognitive Perspectives</td>
<td>CSE 100: Advanced Data Structures</td>
<td>VIS 135: Design Research Methods</td>
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<tr>
<td>COGS 174: Drugs: Brain, Mind and Culture</td>
<td>COGS 120: Interaction Design</td>
<td>CSE 130: Programming Lang: Principles and Paradigms</td>
<td>VIS 147B: Electronic Technologies for Art II</td>
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<tr>
<td>COGS 176: From Sleep to Attention</td>
<td>COGS 122: Interaction Design Startup</td>
<td>CSE 132B: Database Systems Applications</td>
<td>VIS 161: Systems and Networks at Scale</td>
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<tr>
<td>Biochemistry</td>
<td>COGS 123: Social Computing</td>
<td>CSE 134B: Web Client Languages</td>
<td>VIS 162: Speculative Science and Design Invention</td>
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<td>BIBC 100: Structural Biochemistry</td>
<td>COGS 124: HCI Technical Systems Research</td>
<td>CSE 135: Online Database Analytics Applications</td>
<td>VIS 163: Design Research and Criticism</td>
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<tr>
<td>Biology-Animal Physiology and Neuroscience</td>
<td>COGS 126: Human-Computer Interaction</td>
<td>CSE 151: Introduction to Artificial Intelligence: Statistical Approaches</td>
<td>VIS 177: Scripting Strategies</td>
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<td>BIPN 100: Human Physiology I</td>
<td>COGS 128: Communication Disorders</td>
<td>CSE 152: Intro Computer Vision</td>
<td>VIS 180A: Documentary Evidence and the Construction of Authenticity in Current Media Practices</td>
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<tr>
<td>PSYC 100: Clinical Psychology</td>
<td>COGS 132: HCI Technical Systems Research</td>
<td>CSE 176A: Maker Topics: Health Care Robotics</td>
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<td>PSYC 116: Lab in Clinical Psychology Research</td>
<td>COGS 125: Advanced Interaction Design</td>
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<td>PSYC 120: Learning and Motivation</td>
<td>COGS 126: Human-Computer Interaction</td>
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<td>PSYC 124: Clinical Assessment and Treatment</td>
<td>COGS 128: Communication Disorders</td>
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<td>PSYC 125: Clinical Neuropsychology</td>
<td>COGS 130: Social Computing</td>
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<td>PSYC 134: Eating Disorders</td>
<td>COGS 132: HCI Technical Systems Research</td>
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<td>PSYC 140: Human Behavior Lab</td>
<td>COGS 125: Advanced Interaction Design</td>
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<td>PSYC 145: Behavior Modification</td>
<td>COGS 126: Human-Computer Interaction</td>
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<td>PSYC 155: Social Psychology and Medicine</td>
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<td>COGS 124: HCI Technical Systems Research</td>
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<tr>
<td>PSYC 179: Drugs, Addiction, Mental Disorders</td>
<td>COGS 129: Computer Interaction</td>
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<tr>
<td>PSYC 181: Drugs and Behavior</td>
<td>COGS 130: Social Computing</td>
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<tr>
<td>PSYC 186: Impulse Control Disorders</td>
<td>COGS 132: HCI Technical Systems Research</td>
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</tbody>
</table>

Cross-Campus Online: PSY BEH 102C: Abnormal Psychology (UC Irvine)
Visit crossenroll.universityofcalifornia.edu to enroll.