COGNITIVE SCIENCE MAJOR

Students must also complete the Undergraduate Registration Requirement (https://catalogs.northwestern.edu/undergraduate/requirements-policies/undergraduate-registration-requirement) and the degree requirements of their home school.

3 introductory courses:
- COG_SCI 207-0: Introduction to Cognitive Modeling
- COG_SCI 210-0: Language and the Brain
- COG_SCI 211-0: Learning, Representation & Reasoning

3 basic methodology courses:
- COMP_SCI 110-0 or COMP_SCI 111-0: Introduction to Computer Programming
- PSYCH 201-0: Statistical Methods in Psychology
- COG_SCI 202-0: Evaluating Evidence (PSYCH 205-0 Research Methods in Psychology may be substituted for COG_SCI 202-0 Evaluating Evidence)

3 core courses: 1 course each from three of the following areas:

**Artificial Intelligence**
- COMP_SCI 348-0: Introduction to Artificial Intelligence

**Cognitive Neuroscience**
- PSYCH 221-0: Introduction to Neuroscience
- PSYCH 328-0: Brain Damage and the Mind
- CSD 303-0: Brain and Cognition

**Cognitive Psychology**
- PSYCH 228-0: Cognitive Psychology

**Learning Sciences**
- LOC 308-0: Redesigning Everyday Organizations
- LOC 313-0: Learning and Thinking in Organizations

**Linguistics**
- LING 250-0: Sound Patterns in Human Language
- LING 260-0: Formal Analysis of Words & Sentences
- LING 270-0: Meaning

**Philosophy of Mind**
- PHIL 225-0: Minds and Machines
- PHIL 325-0: Philosophy of Mind

**Music Cognition**
- MUS_THRY 251-0: Music and Mind

1 advanced proseminar:
- COG_SCI 366-0: Cognitive Science Proseminar (ideally should be taken in sophomore year)

6 advanced electives, at least 3 in a concentration listed below and at least 2 outside that area, chosen from:

- Artificial Intelligence (p. 1)
- Cognitive Neuroscience (p. 1)
- Cognitive Psychology (p. 1)
- Communication Science and Disorders (p. 2)
- Culture and Cognition (p. 2)
- Learning and Instruction (p. 2)
- Linguistics (p. 2)
- Music Cognition (p. 2)
- Philosophy (p. 2)

Other 300- and 400-level courses may be counted as advanced electives with consent of the cognitive science adviser.

Independent study (399) in cognitive science or in one of the departments listed above, which is strongly recommended, may count as an advanced elective.

For students pursuing honors, the second quarter COG_SCI 398-2 Senior Thesis Seminar may count as an advanced elective.

- At most 5 courses counted toward the cognitive science major may be double-counted toward another major. Courses used to meet major requirements may not be double-counted toward a minor.

### Advanced Elective Areas

#### Artificial Intelligence

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP_SCI 325-1</td>
<td>Artificial Intelligence Programming</td>
</tr>
<tr>
<td>COMP_SCI 337-0</td>
<td>Natural Language Processing</td>
</tr>
<tr>
<td>COMP_SCI 338-0</td>
<td>Practicum in Intelligent Information Systems</td>
</tr>
<tr>
<td>COMP_SCI 344-0</td>
<td>Design of Computer Problem Solvers</td>
</tr>
<tr>
<td>COMP_SCI 348-0</td>
<td>Introduction to Artificial Intelligence</td>
</tr>
<tr>
<td>COMP_SCI 349-0</td>
<td>Machine Learning</td>
</tr>
<tr>
<td>COMP_SCI 371-0</td>
<td>Knowledge Representation and Reasoning</td>
</tr>
<tr>
<td>COMP_SCI 372-0/472-0</td>
<td>Designing &amp; Constructing Models with Multi-Agent Language</td>
</tr>
</tbody>
</table>

Relevant sections of:
- COMP_SCI 396-0: Special Topics in Computer Science

#### Cognitive Neuroscience

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>BIOL_SCI 302-0</td>
<td>Fundamentals of Neurobiology</td>
</tr>
<tr>
<td>CSD 303-0</td>
<td>Brain and Cognition</td>
</tr>
<tr>
<td>CSD 310-0</td>
<td>Biological Foundations of Speech and Music</td>
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<tr>
<td>NEUROSCI 320-0</td>
<td>Animal Behavior</td>
</tr>
<tr>
<td>NEUROSCI 360-0</td>
<td>Neuroscience of Brain Disorders</td>
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<tr>
<td>NEUROSCI 377-0</td>
<td>Neurobiology of Sensation and Perception</td>
</tr>
<tr>
<td>PSYCH 249-0</td>
<td>Buddhist Psychology</td>
</tr>
<tr>
<td>PSYCH 322-2</td>
<td>Selected Topics in Neuroscience and Psychophysiology</td>
</tr>
<tr>
<td>PSYCH 324-0</td>
<td>Perception</td>
</tr>
<tr>
<td>PSYCH 327-0</td>
<td>Brain and Cognition</td>
</tr>
<tr>
<td>PSYCH 328-0</td>
<td>Brain Damage and the Mind</td>
</tr>
<tr>
<td>PSYCH 336-0</td>
<td>Consciousness</td>
</tr>
<tr>
<td>PSYCH 374-0</td>
<td>Human Memory</td>
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<tr>
<td>PSYCH 379-0</td>
<td>Neuroscience &amp; Behavior Laboratory</td>
</tr>
</tbody>
</table>

Relevant sections of:
- PSYCH 391-0: Advanced Seminar in Cognition or Neuroscience |
- PSYCH 460-0: Special Topics in Cognition |
- PSYCH 470-0: Topics in Brain, Behavior, and Cognition

#### Cognitive Psychology

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>PSYCH 333-0</td>
<td>Psychology of Thinking</td>
</tr>
<tr>
<td>PSYCH 336-0</td>
<td>Consciousness</td>
</tr>
<tr>
<td>PSYCH 338-0</td>
<td>Psychology of Instructional Design and Technology</td>
</tr>
<tr>
<td>PSYCH 344-0</td>
<td>Cultural Psychology</td>
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<tr>
<td>PSYCH 370-0</td>
<td>Cognitive Development</td>
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<tr>
<td>PSYCH 372-0</td>
<td>Language and Cognition</td>
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<tr>
<td>PSYCH 373-0</td>
<td>Decision Making</td>
</tr>
<tr>
<td>PSYCH 374-0</td>
<td>Human Memory</td>
</tr>
<tr>
<td>PSYCH 461-0</td>
<td>Reasoning and Representation</td>
</tr>
</tbody>
</table>
Cognitive Science Major

PSYCH 466-0 | Analogy and Similarity
Relevant sections of:
PSYCH 391-0 | Advanced Seminar in Cognition or Neuroscience
PSYCH 460-0 | Special Topics in Cognition

Communication Sciences and Disorders

Course | Title
--- | ---
CSD 301-0 | Anatomy and Physiology of the Vocal Mechanism
CSD 303-0 | Brain and Cognition
CSD 306-0 | Psycholinguistics
CSD 309-0 | Culture, Language and Learning
CSD 342-0 | Language and Cognition in Atypical Development
CSD 392-0 | Language Development and Usage
CSD 406-0 | Medical Aspects of Audiology
CSD 453-0 | Overview of Language Disorders
CSD 454-0 | Language Disorders

Relevant sections of:
CSD 457-0 | Language Science

Culture and Cognition

Course | Title
--- | ---
ANTHRO 389-0 | Ethnographic Methods and Analysis
ECON 330-0 | Behavioral Economics
LOC 214-0 | Culture and Cognition
LING 341-0 | Language Typology
PSYCH 344-0 | Cultural Psychology
PSYCH 372-0 | Language and Cognition

Relevant sections of:
ANTHRO 390-0 | Topics in Anthropology
ANTHRO 395-0 | Field Study in Anthropology

Learning and Instruction

Course | Title
--- | ---
CSD 303-0 | Brain and Cognition
CSD 306-0 | Psycholinguistics
CSD 342-0 | Language and Cognition in Atypical Development
CSD 373-0 | Learning Disabilities
CSD 392-0 | Language Development and Usage
LOC 313-0 | Learning and Thinking in Organizations (if not counted as a core course)
LRN_SCI 401-0 | Knowledge Representation for the Learning Sciences
LRN_SCI 425-0 | Introduction to Design for the Learning Sciences
LRN_SCI 426-0 | Design of Technological Tools for Thinking and Learning
LRN_SCI 429-0 | Design of Learning Environments

Relevant sections of:
LRN_SCI 451-0 | Topics in Learning Sciences

Linguistics

Course | Title
--- | ---
LING 300-0 | Topics in Linguistics
LING 311-0 | Child Language
LING 315-0 | Experimental Approaches to Word Form Processing
LING 316-0 | Experimental Syntax
LING 317-0 | Experimental Pragmatics
LING 321-0 | Bilingualism
LING 330-0 | Research Methods in Linguistics
LING 334-0 | Introduction to Computational Linguistics
LING 341-0 | Language Typology
LING 342-0 | Structure of Various Languages
LING 350-0 | Fundamentals of Laboratory Phonology
LING 360-0 | Fundamentals of Syntax
LING 361-0 | Morphology
LING 370-0 | Fundamentals of Meaning
LING 371-0 | Reference
LING 372-0 | Pragmatics
LING 373-0 | Implicature

Music Cognition

Course | Title
--- | ---
MUS_THRY 251-0 | Music and Mind
MUSIC_ED 437-0 | Psychology of Music Teaching & Learning

Relevant sections of:
MUS_THRY 335-0 | Selected Topics in Music Theory
MUS_THRY 336-0 | Selected Topics in Music Cognition
MUS_THRY 435-0 | Selected Topics in Music Theory
MUS_THRY 436-0 | Selected Topics in Music Cognition

Philosophy

Course | Title
--- | ---
PHIL 250-0 | Elementary Logic II
PHIL 325-0 | Philosophy of Mind
PHIL 327-0 | Philosophy of Psychology
PHIL 330-0 | Practical Reasoning and Choice
PHIL 350-0 | Advanced Logic
PHIL 351-0 | Advanced Topics in Philosophical Logic
PHIL 353-0 | Philosophy of Language

Relevant sections of:
PHIL 410-0 | Seminar: Special Topics in Philosophy
PHIL 426-0 | Seminar in Philosophy of Mind

Honors in Cognitive Science

Majors with strong academic records and an interest in pursuing honors should contact the director of undergraduate studies in early spring of junior year. Qualifying students prepare a thesis proposal under the guidance of a faculty mentor and present the proposal, along with the names of the mentor and a second faculty reader, to the program committee for review. After committee approval of the proposal, students normally enroll in COG_SCI 398-1 Senior Thesis Seminar in fall and COG_SCI 398-2 Senior Thesis Seminar in winter of senior year. With the permission of the director of undergraduate studies, 1 quarter of COG_SCI 399-0 Independent Study may be substituted for one of either COG_SCI 398-1 Senior Thesis Seminar or COG_SCI 398-2 Senior Thesis Seminar.

Students whose projects, theses, and grades meet program criteria are recommended to the college for graduation with honors. For more information consult the director of undergraduate studies and see the section on Honors in the Major of the Weinberg Academic Options and Support (https://catalogs.northwestern.edu/undergraduate/arts-sciences/#academicoptionstext) Page.