

Bachelor of Science in Cognitive Science

Fall 2022 Requirements

What is Cognitive Science?

Cognitive Science is the interdisciplinary study of the mind as an information processor. It is a relatively new discipline that arose in the mid-20th century from a convergence of conceptual revolutions primarily in psychology, computer science, and linguistics. Today it also draws from fields such as philosophy, neuroscience, and anthropology. A central goal of cognitive science is to determine structures and processes that underwrite cognitive tasks such as perception, memory, attention, language and motor control. This, in turn, plays an important role in applied research areas such as artificial intelligence, educational psychology, the science of language, and communication disorders.

Career Paths

There is no single career path for Cognitive Science majors. It is anticipated that most graduates of the program will seek postgraduate training to satisfy their professional aspirations. Our undergraduates have pursued a broad range of degrees at both the master's and PhD levels. Examples include: audiology, cognitive science, computer science, linguistics, medicine, neuroscience, nursing, occupational therapy, public health administration, speech/language pathology, philosophy, and psychology. Cognitive science prepares one with a solid educational foundation in human cognition and considerable skills in scientific reasoning, critical thinking, and clarity of expression. We have an excellent record of graduate placement and success. **Because admission to graduate programs is highly competitive, we strongly recommend that students maintain a 3.6 GPA or higher.**

The Cognitive Science Curriculum

There are two parts to the Cognitive Science B.S. The first is a set of core courses required of all cognitive science majors. The second is a **minimum** of 21 credits in an area of specialization.

- No course can be used to satisfy more than one requirement within the major.
e.g. If you take PSYC314 as your Advanced CGSC/PSYC Course requirement, you may not use it towards your area of specialization.
- Students must earn a C- or higher in all courses within the major, including those that make up the area of specialization. **However, CGSC378, 379, and 380 have a prerequisite requirement of a C or higher in CGSC375 or 376.**
- 600-level courses count only for those working towards an **honors B.S.** in Cognitive Science.
- CGSC majors who are majoring or minoring in Linguistics may not use the same courses to count towards both degrees or programs, with the exception of LING101.

Cognitive Science, B.S., Core Requirements (22 credits)

Key to Abbreviations

A,B,C,D	Satisfies Breadth Requirements A,B,C,D for the University and the College of Arts and Sciences
a,b,c,d	Satisfies Breadth Requirements A,B,C,D for either the University or the College of Arts and Sciences (indicated by <i>uni</i> or <i>cas</i>)
DLE	Satisfies the Discovery Learning Experience requirement.
<i>sub</i>	Substitute course. E-mail cgsc-advise@udel.edu after enrolling in this course so we can get it to count on your degree audit.

All of the following (6 credits):

CGSC170^C	Introduction to Cognitive Science
LING101^C	Introduction to Linguistics

Advice:

- Take LING101 during your first semester.
- Take CGSC170 during your first or second year.

Psychology – One of the following (3 credits):

NSCI100^D_{sub}	Psychological and Brain Sciences
PSYC100^C	General Psychology

Advice:

- Take during your first semester.

Biology – 4 credits from the following list:

BISC104^D	Principles of Biology with Lab	
BISC207^D	Introductory Biology I	Coreqs: CHEM103 and CHEM133, or CHEM111

Advice:

- Take during your first or second year.
- If you received AP credit for BISC208, e-mail cgsc-advise@udel.edu to request a substitution.

Advanced PSYC/CGSC – 3 credits from the following list:		
CGSC420^{DLE}	Research Methods in Cognitive Science	Coreqs: Statistics Requirement
CGSC451	Topics in Cognitive Science	Prereqs: CGSC170
CGSC470	Elements of Cognitive Science	Prereqs: CGSC170
NSCI320^{D sub}	Introduction to Neuroscience	Prereqs: C- or higher in PSYC100 or NSCI100 X-listings: PSYC320
PSYC314^D	Brain and Behavior	Prereqs: C- or higher in PSYC100 or NSCI100 X-listings: CGSC314
PSYC340	Cognition	Prereqs: C- or higher in PSYC207 and 209 X-listings: CGSC340
PSYC350	Developmental Psychology	Prereqs: C- or higher in PSYC207 and 209

Advice:

- Take third or fourth year.
- NSCI320 and PSYC314 fulfill a neuroscience or brain-related course prereq for many grad. programs.
- Honors sections of NSCI320 are offered frequently.

Computational – 3 credits from the following list:		
CISC101^D	Principles of Computing	
CISC103^D	Intro. to Computer Science with Web Applications	
CISC106^{D sub}	General Computer Science for Engineers	Coreqs: MATH241 or higher
CISC108^D	Intro. to Computer Science I	Coreqs: MATH115, 117, or higher math course or math placement
CISC181^D	Intro. to Computer Science II	Prereqs: C- or higher in CISC106 or 108 Coreqs: MATH221, 241, or a higher level math course or math placement
LING202^{d(cas)}	Science of Language	Prereqs: LING101
PHIL205^D	Logic	

Advice:

- Take during your first or second year.
- PPSLP or Science of Language tracks: Take LING202 right after LING101. LING202 is a pre-/co-req for numerous linguistics courses.
- Also doing a Philosophy minor/major? Take PHIL205; it is one option that will fulfill the logic requirement for the Philosophy minor/major. (based on Fall 2022 Philosophy major/minor)
- CMLF track: Take CISC106 or CISC108 to satisfy the prereq for CISC210.

Statistics – 3 credits from the following list:		
MATH202	Intro. to Statistical Methods II	Prereqs: MATH201
MATH205	Statistical Methods	Prereqs: MATH210 or 230
PSYC209	Measurement and Statistics	Prereqs: C- or higher in PSCY100 or NSCI100 and one course in basic college mathematics
SOCI301	Intro. to Sociological Research	Prereqs: SOCI201 and completion of the College of Arts and Sciences Math requirement
STAT200^D	Basic Statistical Principles	

Advice:

- Take during your first or second year.
- The Psychology major/minor's 'PSYC209' requirement can be satisfied by any of these courses, as well.

Science of Language Specialization Requirements (21 credits)

All of the following (6 credits):

LING403	Intro. to Phonology	Prereqs: LING101 and 202
LING404^C	Structure of Language	Prereqs: LING101

Semantics – One of the following (3 credits):

CGSC490	Philosophy of Language	X-listings: PHIL490
LING418	Meaning and Language Use	Prereqs: LING101 X-listings: CGSC418, PHIL418

Capstone – One of the following (3 credits):

CGSC485	Seminar in Cognitive Science	
LING401^B	Historical Linguistics	Prereqs: LING101 X-listings: LLCU401
LING471^{C,DLE}	Discovering Human Language	Prereqs: LING101 X-listings: CGSC471
LING480	Sociolinguistics	Prereqs: LING101 and 202

Restricted Electives – 9 credits of LING courses, CGSC courses cross-listed with LING, or CGSC485 (6 credits must be at the 300-level or above; up to 3 credits of independent study in linguistics (LING366/466) are allowed). Current options are shown below.		
CGSC433	Intro. to Acoustic Phonetics	Prereqs: LING353 X-listings: LING433
CGSC496	Psycholinguistics	Prereqs: LING101 and 202 X-listings: LING496
EDUC462_{sub}	Language Acquisition	X-listings: LING462, PSYC462
EDUC472_{sub}	Teaching English as a Second Language	X-listings: LING472
ENGL390^C_{sub}	English Linguistics	Prereqs: ENGL110 X-listings: LING390
FREN314_{sub}	French Phonetics	Prereqs: Any 200-level French course conducted in the French language.
FREN403^C_{sub}	Structure of French	Prereqs: FREN314 and another 300-level French course.
LINGX67	SEMINAR	
LING102^C	Language, Mind and Society	X-listings: CGSC102
LING201^B	Languages Invented for Books and Film	
LING202^{d(cas)}	Science of Language	Prereqs: LING101
LING203^C	Languages of the World	X-listings: LLCU203
LING222^C	Language and Gender	X-listings: WOMS222
LING265^C	Studies in Language	
LING353^{DLE}	Intro. to Speech and Hearing Science	Prereqs: LING101 Coreqs: LING202 X-listings: CGSC353
LING401^B	Historical Linguistics	Prereqs: LING101 X-listings: LLCU401
LING418	Meaning and Language Use	Prereqs: LING101 X-listings: CGSC418, PHIL418
LING444	First Language Development	Prereqs: LING101
LING471^{C,DLE}	Discovering Human Language	Prereqs: LING101 X-listings: CGSC471
LING476	Second Language Acquisition and Bilingualism	Prereqs: LING101 X-listings: EDUC476
LING477	The Structure of English	Prereqs: LING101 X-listings: EDUC477, ENGL477
LING480	Sociolinguistics	Prereqs: LING101 and 202
LING499	Issues in Teaching English Language Learners	
LLCU421_{sub}	Methods of Teaching Foreign Languages	X-listings: LING421
LLCU422_{sub}	Language Syllabus Design	X-listings: LING422
LLCU424_{sub}	Second Language Testing	X-listings: LING424
SPAN314_{sub}	Spanish Phonetics and Phonology	Prereqs: SPAN200 X-listings: LING314

Philosophical Foundations of Cognitive Science Specialization Requirements (21 credits)

Restricted Electives – 18 credits from the following list (15 credits must be at the 300-level or above):

ANTH202^D_{sub}	Genes, Bones, and Evolution	X-listings: CGSC202
ANTH205^A_{sub}	Anthropology and Human Nature	X-listings: CGSC205
CGSC404^C	Animal Minds	X-listings: PHIL404
CGSC410^C	Embodied Cognition	
CGSC420^{DLE}	Research Methods in Cognitive Science	Coreqs: Statistics Requirement
CGSC421^A	Philosophy, Biology, Society	X-listings: PHIL421
CGSC451	Topics in Cognitive Science	Prereqs: CGSC170
CGSC470	Elements of Cognitive Science	Prereqs: CGSC170
CGSC485_{sub}	Seminar in Cognitive Science	
CGSC490	Philosophy of Language	X-listings: PHIL490
CGSC496	Psycholinguistics	Prereqs: LING101 and 202 X-listings: LING496
EDUC462	Language Acquisition	X-listings: LING462, PSYC462
LING102^C_{sub}	Language, Mind and Society	X-listings: CGSC102
LING202^{d(cas)}_{sub}	Science of Language	Prereqs: LING101
LING404^C	Structure of Language	Prereqs: LING101
LING418	Meaning and Language Use	Prereqs: LING101 X-listings: CGSC418, PHIL418
LING444	First Language Development	Prereqs: LING101
PHIL105^A_{sub}	Critical Thinking	
PHIL205^D	Logic	
PHIL207^D	Scientific Reasoning	
PHIL211^D	Basic Decision Theory	
PHIL305^B_{sub}	Twentieth-Century Philosophy	
PHIL306^A	Philosophy of Science	
PHIL315^A_{sub}	Metaphysics	Prereqs: One philosophy course
PHIL316^A_{sub}	Time Travel	
PHIL320^A	Theory of Knowledge	X-listings: CGSC320
PHIL327^A	Race, Gender, Science	X-listings: AFRA327, CGSC327, WOMS327
PHIL330^C	Philosophy of Mind	X-listings: CGSC330

Capstone – One of the following (3 credits):

CGSC451	Topics in Cognitive Science	Prereqs: CGSC170
CGSC470	Elements of Cognitive Science	Prereqs: CGSC170
CGSC485	Seminar in Cognitive Science	

Advice:

- Add a Philosophy minor – with the correct planning, you can complete it by taking as few as one additional course (either PHIL301 or 303). (based on Fall 2022 Philosophy minor)

Psychological Foundations of Cognitive Science Specialization Requirements (21 credits)

PSYC/NSCI – 9 credits from the following list		
NSCI320^D	Intro. to Neuroscience	Prereqs: C- or higher in PSYC100 or NSCI100
NSCI468^{DLE}	Advanced Research	Prereqs: NSCI368
PSYC310	Sensation and Perception	Prereqs: C- or higher in PSYC207 and 209
PSYC312	Learning and Motivation	Prereqs: C- or higher in PSYC207 and 209
PSYC314^D	Brain and Behavior	Prereqs: C- or higher in PSYC100 or NSCI100 X-listings: CGSC314
PSYC325^C	Child Psychology	Prereqs: PSYC100
PSYC334^C	Abnormal Psychology	Prereqs: PSYC100
PSYC340	Cognition	Prereqs: C- or higher in PSYC207 and 209 X-listings: CGSC340
PSYC344	Psychology of Language	Prereqs: C- or higher in PSYC207 and 209
PSYC350	Developmental Psychology	Prereqs: C- or higher in PSYC207 and 209
PSYC365^{DLE}	Psychology Field Placement	Prereqs: C- or higher in PSYC207 and 209
PSYC380	Psychopathology	Prereqs: C- or higher in PSYC207 and 209
PSYC414	Drugs and the Brain	Prereqs: PSYC314 or NSCI320; PSYC209 X-listings: NSCI414
PSYC431	Hormones and Behavior	X-listings: NSCI431
PSYC433	Cognitive Neuroscience	Prereqs: C- or higher in PSYC314 or NSCI320; C- or higher in PSYC209
PSYC436	Nature vs. Nurture	Prereqs: C- or higher in PSYC207 and 209 X-listings: NSCI436
PSYC445	Topics in Adolescent Psychology	Prereqs: C- or higher in PSYC207 and 209
PSYC446^{C(cas)}	Psychology of Music	Prereqs: C- or higher in PSYC100 or NSCI100
PSYC481	Clinical Psychology	Prereqs: C- or higher in PSYC207 and 209

Capstone – One of the following (3 credits):		
CGSC451	Topics in Cognitive Science	Prereqs: CGSC170
CGSC470	Elements of Cognitive Science	Prereqs: CGSC170
CGSC485	Seminar in Cognitive Science	

Non-PSYC/-NSCI – 9 credits from the following list (6 credits at the 300-level or above):		
ANTH202^D_{sub}	Genes, Bones, and Human Evolution	X-listings: CGSC202
ANTH205^A	Anthropology and Human Nature	X-listings: CGSC205
ANTH305^D_{sub}	Evolution of Human Sex Roles and Reproduction	X-listings: WOMS305
CGSC404^C	Animal Minds	X-listings: PHIL404
CGSC410^C	Embodied Cognition	
CGSC420^{DLE}	Research Methods in Cognitive Science	Coreqs: Statistics Requirement
CGSC421^A	Philosophy, Biology, Society	X-listings: PHIL421
CGSC451	Topics in Cognitive Science	Prereqs: CGSC170
CGSC470	Elements of Cognitive Science	Prereqs: CGSC170
CGSC485_{sub}	Seminar in Cognitive Science	
CGSC490	Philosophy of Language	X-listings: PHIL490
CGSC496	Psycholinguistics	Prereqs: LING101 and 202 X-listings: LING496
EDUC462	Language Acquisition	X-listings: LING462, PSYC462
LING102^C_{sub}	Language, Mind and Society	X-listings: CGSC102
LING202^{d(cas)}_{sub}	Science of Language	Prereqs: LING101
LING404^C	Structure of Language	Prereqs: LING101
LING418	Meaning and Language Use	Prereqs: LING101 X-listings: CGSC418, PHIL418
LING444	First Language Development	Prereqs: LING101
LING480_{sub}	Sociolinguistics	Prereqs: LING101 and 202
PHIL205^D_{sub}	Logic	
PHIL207^D_{sub}	Scientific Reasoning	
PHIL211^D_{sub}	Basic Decision Theory	
PHIL305^B_{sub}	Twentieth-Century Philosophy	
PHIL306^A_{sub}	Philosophy of Science	
PHIL320^A	Theory of Knowledge	X-listings: CGSC320
PHIL327^A	Race, Gender, Science	X-listings: AFRA327, CGSC327, WOMS327
PHIL330^C	Philosophy of Mind	X-listings: CGSC330

Advice:

- The common PSYC209 prereq is actually satisfied by any of the courses in the CGSC Statistics requirement (MATH202, MATH205, STAT200, SOCI301, PSYC209).
- If you are also doing a Psychology major or minor, note that the ‘PSYC209’ requirement of those programs is satisfied by any of the courses in the CGSC Statistics requirement.
- Add a Psychology minor – with the correct planning, the only extra course you’ll need is PSYC207! (based on Fall 2021 Psychology minor)

**Computational, Mathematical, and Logical Foundations of Cognitive Science
Specialization Requirements (21 credits)**

Advanced LING/CGSC Courses – 6 credits from the following list:		
CGSC451	Topics in Cognitive Science	Prereqs: CGSC170
CGSC470	Elements of Cognitive Science	Prereqs: CGSC170
CGSC496	Psycholinguistics	Prereqs: LING101 and 202 X-listings: LING496
LING404^C	Structure of Language	Prereqs: LING101

Advice:

- Although your degree audit may still show LING451 and 455 as options, these courses have been discontinued.

Basic CISC Course – All of the following (6 credits):		
CISC210	Introduction to Systems Programming	Prereqs: C- or higher in CISC106 or 108 Coreqs: MATH221, 241, or a higher level math course or math placement
CISC220	Data Structures	Prereqs: C- or higher in CISC210 Coreqs: MATH210 or 241

Intermediate CISC Course – One of the following (3 credits):		
CISC275	Intro. to Software Engineering	Prereqs: C- or higher in CISC181 and 220
CISC303	Automata Theory	Prereqs: C- or higher in MATH210 and CISC220
CISC304	Logic and Programming	Prereqs: C- or higher in CISC220 and MATH210

Advanced CISC Course – One of the following (3 credits):		
CISC401	Elements of the Theory of Computation	Prereqs: CISC303
CISC404	Logic in Computer Science	Prereqs: CISC304
CISC471	Compiler Design	Prereqs: CISC260 and 303
CISC481	Artificial Intelligence	Prereqs: C- or higher in CISC220; CISC304 X-listings: CGSC481
CISC484	Intro. to Machine Learning	Prereqs: CISC220 and MATH205 or MATH350
CISC489	Topics: Artificial Intelligence	

Capstone – One of the following (3 credits):		
CGSC451	Topics in Cognitive Science	Prereqs: CGSC170
CGSC470	Elements of Cognitive Science	Prereqs: CGSC170
CGSC485	Seminar in Cognitive Science	
LING401^B	Historical Linguistics	Prereqs: LING101 X-listings: LLCU401
LING471^{C,DLE}	Discovering Human Language	Prereqs: LING101 X-listings: CGSC471
LING480	Sociolinguistics	Prereqs: LING101 and 202

Advice:

- Add a Computer Science minor – you’ll just need to add CISC181! (based on Fall 2021 Computer Science minor)
- Take MATH241 for your College of Arts & Science Math Requirement.
- Note that many CISC courses have MATH prereqs, and those MATH courses may have their own prereqs.
e.g. MATH210 (a pre/coreq for numerous CISC courses) has a coreq of MATH241, 242 or 232.
- Keep the following 5-semester sequence in mind:
CISC106/108 → CISC210 → CISC220 → intermediate CISC courses → most advanced courses

**Pre-Professional Speech/Language Pathology Specialization Requirements
(27-28 credits)**

All of the following (15 credits)		
CGSC375	Intro. to Communication Disorders in Children	Prereqs: LING101
CGSC376	Intro. to Communication Disorders of Adulthood	Prereqs: LING101
CGSC378	Anatomy and Physiology of Speaking	Prereqs: C or higher in CGSC375 or 376
CGSC379	Intro. to Audiology	Prereqs: C or higher in CGSC375 or 376
LING353^{DLE}	Intro. to Speech and Hearing Science	Prereqs: LING101 Coreqs: LING202 X-listings: CGSC353

Advice:

- CGSC375 and 376 can be taken in either order.
- CGSC378 and 379 can be taken in either order.
- CGSC379 requires special clearances. See <https://www.ocs.udel.edu/clearances/> for information.

Phonetics/Phonology Course – One of the following (3 credits):		
CGSC433	Intro. to Acoustic Phonetics	Prereqs: LING353 X-listings: LING433
LING403	Intro. to Phonology	Prereqs: LING101 and 202

Language Acquisition – One of the following (3 credits):		
EDUC462	Language Acquisition	X-listings: LING462, PSYC462
LING444	First Language Development	Prereqs: LING101

Restricted Elective – One of the following (3 credits):		
CGSC496	Psycholinguistics	Prereqs: LING101 and 202 X-listings: LING496
LING480	Sociolinguistics	Prereqs: LING101 and 202

Capstone (3 credits):		
CGSC380	Clinical Principles and Procedures in Speech Pathology	Prereqs: C or higher in CGSC375 or 376

Advice:

- CGSC380 should be taken after CGSC378 and CGSC379 whenever possible.
- CGSC380 requires special clearances. See <https://www.ocs.udel.edu/clearances/> for information.

Advice:

- Some of the courses for the SLP area of specialization are offered in fall and spring semesters, but some are not. These include:
 - CGSC375 Intro. to Communication Disorders in Children (1x/yr; Typically Fall)
 - CGSC376 Intro. to Communication Disorders of Adulthood (1x/yr; Typically Spring)
 - CGSC379 Intro. to Audiology (1x/yr; Typically Fall)
 - EDUC462 Language Acquisition (infrequent)
 - LING403 Intro. to Phonology (1x/yr; Typically Fall)
 - LING480 Sociolinguistics (1x/yr; Typically Spring)
- Keep the following sequences in mind:
 - LING101 → LING202 → LING403/LING480/CGSC496
 - LING101 → LING202 + LING353 → CGSC433
- Though you only *need* to take one of the Phonology/Phonetics courses in the PPSLP track (i.e. LING 403, CGSC433), they are both recommended.
- You can also try working in a campus lab for credit and research experience.
- Join [UD's NSSLHA chapter](#).
- Grad programs vary in the prereqs they require. You can research prereqs through ASHA's EdFind (find.asha.org/ed/)

Additional Courses Suggested for PPSLP Students:

CGSC360	Aural Rehabilitation (2 credits)	Prereqs: CGSC379
CGSC377	Critical Thinking in a Clinical Setting	Prereqs: CGSC376
ENGL410	Technical Writing	Prereqs: ENGL110
HDFS339	Adult Development and Aging	Prereqs: HDFS201
HDFS346	Counseling in Human Services	Coreqs: HDFS334
HDFS405^C	Aging and the Family	
HLTH215^A	Healthcare Communication: UDSP	X-listings: THEA214, 215

Suggested Physical Science Courses for PPSLP Students:

CHEM100^D	Chemistry and Human Environment	
CHEM101-104^D	General Chemistry	Prereqs: varies by course # Coreqs: varies by course #
PHYS201^D	Introductory Physics I	Prereqs: MATH115, 117, 221, 231, or 241 Coreqs: PHYS221
SCEN101^D	Physical Science	

Advice:

- For information on ASHA's (<https://www.asha.org>) Physical Science requirement, see <https://www.asha.org/Certification/Course-Content-Areas-for-SLP-Standards>.