

BACHELOR OF SCIENCE IN COGNITIVE SCIENCE

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 18 credits in an area of specialization.

- No course can be used to satisfy more than one requirement.
Example: If you take PSYC314 as one of your core requirements (1B), you may not use it towards your area of specialization (section 2).
- Students must earn a C- or higher in all courses within the major, including those that make up the area of specialization. **However, CGSC378, CGSC379, and CGSC380 have a pre-requisite requirement of a C or better in CGSC376.**
- 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 LING 101 and CGSC485.

CGSC BS, CORE COURSES, 25 CREDITS

A. ALL OF THE FOLLOWING, 12 CREDITS

CGSC 170	Introduction to Cognitive Science	Take freshman or sophomore year
CGSC 485	Seminar in Cognitive Science	Take senior year. Satisfies 2 nd Writing requirement
LING 101	Introduction to Linguistics	Take first semester in major.
PSYC 100	General Psychology	Take first year in major NSCI 100 is an acceptable substitute, email Dr. Andreasen (robina@udel.edu)

B. ADVANCED PSYC/CGSC COURSE: ONE OF THE FOLLOWING, 3 CREDITS

Recommendation: Take junior or senior year. Students who are doing especially well in the major may wish to complete this requirement earlier, say spring semester of sophomore year.

Reminder: The course used to satisfy this requirement may not be double counted towards your area of specialization requirement.

CGSC 410	Embodied Cognition	
CGSC 420	Research Methods in Cognitive Sci.	CoReq.: PSYC 209 or STAT200 or substitutes
CGSC 451	Topics in Cognitive Science	
PSYC 314	Brain and Behavior	PreReq.: PSYC 100 or NSCI100 (C- or above)
PSYC 340	Cognition	PreReq.: PSYC 207 & PSYC 209 or substitutes (C- or above)
PSYC 350	Developmental Psychology	PreReq.: PSYC 207 & PSYC 209 or substitutes (C- or above)

C. BIOLOGY REQUIREMENT: ONE OF THE FOLLOWING, 4 CREDITS

BISC 104	Principles of Biology w/Lab	
BISC 207	Introductory Biology I	CoReq.: CHEM103, 107 or 111

D. COMPUTATIONAL REQUIREMENT: ONE OF THE FOLLOWING, 3 CREDITS

CISC 101	Principles of Computing	
CISC 103	Intro. to Computer Sci. w/Web Apps	CISC106 as substitute, email Dr. Andreasen
CISC 108	General Computer Science	CoReq.: MATH 115, 117 or higher
LING 202	Science of Language	PreReq.: LING 101
PHIL 205	Logic	

E. STATISTICS REQUIREMENT: ONE OF THE FOLLOWING, 3 CREDITS

MATH 202	Intro to Statistical Methods 2	PreReq.: MATH 201
MATH 205	Statistical Methods	PreReq.: MATH 210 or MATH 230
PSYC 209	Measurement & Statistics	PreReq.: PSYC 100
SOCI 301	Intro to Sociological Research	PreReq.: SOCI 201 and A&S Math Skills Requirement
STAT 200	Basic Statistical Practice	

AREA OF SPECIALIZATION REQUIREMENT: 18-27 CREDITS

In addition to completing 25 credits of required core courses, students must complete a minimum of 18 additional credit hours in one of the following areas of specialization. (Some areas of specialization exceed 18 hours.)

- Substitute courses may be proposed in writing to Dr. Andreasen, Director of Undergraduate Studies for Linguistics & Cognitive Science.
- **Reminder:** No course can count more than once towards the BS in Cognitive Science. That is, one may not use a core course and count it towards one's area of specialization.

OPTION 1: COMPUTATIONAL, MATHEMATICAL, & LOGICAL FOUNDATIONS OF COGNITIVE SCIENCE, 18 CR

Students in this area of specialization are strongly encouraged to minor in Computer Science.

A. Two of the Following, 6 credits

CGSC 455	Computational Linguistics (C/L LING455)	PreReq: LING101
CGSC 470	Elements of Cognitive Science	
LING 404	Structure of Language	PreReq: LING101
LING 451	Logical Structures in Language	PreReq: LING101

B. All of the Following, 6 credits

CISC 181	Intro to Computer Science II	PreReq: CISC106 or 108. CoReq: MATH221 or 241 or higher
CISC 220	Data Structures	PreReq: CISC181

C. One of the Following, 3 credits

CISC 275	Intro to Software Engineering	PreReq: CISC220
CISC 303	Automata Theory	PreReq: CISC220 and MATH210
CISC 304	Logic and Programming	Prereq: CISC220 and MATH210

D. One of the Following, 3 Credits

CISC 401	Elements of the Theory of Computation	Prereq: CISC303
CISC 404	Logic in Computer Science	Prereq: CISC304
CISC 470	Programming Languages	Prereq: CISC275
CISC 481	Artificial Intelligence	Prereq: CISC220 and 304
CISC 484	Intro to Machine Learning	Prereq: CISC220 and MATH205
CISC 489	Topics in Artificial Intelligence	Prereq: CISC481

OPTION 2. PHILOSOPHICAL FOUNDATIONS OF COGNITIVE SCIENCE, 18 CR

Six of the Following, 18 Credits. 12 credits must be at the 300-level or above.

CGSC 102	Language, Mind, and Society (C/L LING102)	
CGSC 202	Genes, Bones, and Human Evolution (C/L ANTH202)	
CGSC 205	Anthropology and Human Nature (C/L ANTH205)	
CGSC 327	Race, Gender, Science (C/L, PHIL/WOMS/BAMS 327)	
CGSC 404	Animal Minds (possible C/L, PHIL404)	
CGSC 410	Embodied Cognition (C/L PHIL 410)	
CGSC 418	Meaning & Language Use (C/L LING & PHIL 418)	Prereq: LING101
CGSC 420	Research Methods in Cognitive Science	
CGSC 421	Philosophy, Biology, Society (C/L PHIL 321)	
CGSC 450	Recent Topics in Philosophy of Mind (C/L PHIL 450)	

CGSC 451	Topics in Cognitive Science	
CGSC 455	Computational Linguistics (C/L LING 455)	
CGSC 470	Elements of Cognitive Science	
CGSC 490	Philosophy of Language (C/L PHIL 490)	
LING 444	First Language Development	Prereq: LING101
LING 451	Logical Structures in Language	Prereq: LING101
PHIL 205	Logic	
PHIL 207	Scientific Reasoning	
PHIL 211	Basic Decision Theory	
PHIL 305	Twentieth Century Philosophy	
PHIL 306	Philosophy of Science	
PHIL 315	Metaphysics	
PHIL 316	Time Travel	
PHIL 317	American Philosophy	
PHIL 320	Theory of Knowledge (C/L CGSC 320)	
PHIL 330	Philosophy of Mind (C/L CGSC 330)	

OPTION 3. PSYCHOLOGICAL FOUNDATIONS OF COGNITIVE SCIENCE, 18 CR

- Students in this area of specialization are strongly encouraged to minor in psychology.
- **Reminder:** Students may not double count any core courses towards one's area of specialization.

A. Three of the Following, 9 Credits

NSCI 320	Intro to Neuroscience (C/L PSYC320)	Prereq: PSYC100 or NSCI100
NSCI 431	Stress and the Brain	Prereq: NSCI320
NSCI 433	Cognitive Neuroscience (C/L PSYC 433)	Prereq: PSYC209
NSCI 468	Advanced Research	Prereq: NSCI368, NSCI majors/minors only.
PSYC 310	Sensation & Perception	Prereq: PSYC207 & 209
PSYC 312	Learning & Motivation	Prereq: PSYC207 & 209
PSYC 314	Brain & Behavior (C/L CGSC314)	Prereq: PSYC100 or NSCI100
PSYC 325	Child Psychology	Prereq: PSYC100
PSYC 334	Abnormal Psychology	Prereq: PSYC100. Credit cannot be received for both 334 & 380
PSYC 340	Cognition (C/L CGSC 340)	Prereq: PSYC207 & 209
PSYC 344	Psychology of Language	Prereq: PSYC209
PSYC 350	Developmental Psychology	Prereq: PSYC207 & 209
PSYC 365	Psychology Field Placement	Prereq: PSYC207 & 209
PSYC 380	Psychopathology	Prereq: PSYC100. Credit cannot be received for both 334 & 380
380		
PSYC 408	Psychology of Prejudice	Prereq: PSYC207 & 209
PSYC 414	Drugs in the Brain (C/L NSCI 414)	Prereq: PSYC209
PSYC 428	Nature vs Nurture	
PSYC 431	Hormones and Behavior	Prereq: PSYC100 or NSCI100 & PSYC209
PSYC 440	Topics in Psycholinguistics	Prereq: PSYC207 & 209
PSYC 442	Perception, Memory, and Imagination	Prereq: PSYC207 & 209
PSYC 445	Topics in Adolescent Psychology	Prereq: PSYC207 & 209
PSYC 446	Psychology of Music	Prereq: PSYC100
PSYC 481	Clinical Psychology	Prereq: PSYC207 & 209
PSYC 491	Psychology of Temporal Orientation	Prereq: PSYC207 & 209

B. Three of the Following: 9 Credits, 3 Credits must be at the 300-level or above.

ANTH 202	Genes, Bones, and Human Evolution (C/L CGSC202)
ANTH 205	Anthropology & Human Nature (C/L CGSC205)
CGSC 327	Race, Gender Science (C/L PHIL, BAMS, WOMS 327)
CGSC 404	Animal Minds (possible C/L, PHIL404)
CGSC 410	Embodied Cognition
CGSC 418	Meaning & Language Use (C/L LING/PHIL 418)

CGSC 420 Research Methods in Cognitive Science	Pre-req: CGSC STAT requirement
CGSC 451 Topics in Cognitive Science	
CGSC 455 Computational Linguistics	
CGSC 490 Philosophy of Language (C/L PHIL490)	
CGSC 496 Psycholinguistics	Prereq: LING101
LING 102 Language, Mind, and Society	
LING 202 Science of Language	Prereq: LING101
LING 404 Structure of Language	Prereq: LING101
LING 444 First Language Development	Prereq: LING101
LING 451 Logical Structures of English	Prereq: LING101
LING 462 Language Acquisition	Prereq: LING101
LING 480 Sociolinguistics	
PHIL 205 Logic	
PHIL 207 Scientific Reasoning	
PHIL 211 Basic Decision Theory	
PHIL 305 Twentieth Century Philosophy	
PHIL 306 Philosophy of Science	
PHIL 320 Theory of Knowledge (C/L CGSC320)	
PHIL 330 Philosophy of Mind (C/L CGSC330)	

OPTION 4. SCIENCE OF LANGUAGE, 18 CR

- o 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 LING 101 and CGSC485.
- A. **All of the following, 6 Credits**
 - LING403 Introduction to Phonology Prereq: LING101 and LING202
 - LING404 Structure of Language Prereq: LING101
- B. **One of the following, 3 Credits**
 - LING418 Meaning and Language Use Prereq: LING101
 - CGSC 490 Philosophy of Language (C/L PHIL 490)
- C. **And 9 credits of LING courses or CGSC courses cross-listed with LING.**

OPTION 4. PRE-PROFESSIONAL SPEECH-LANGUAGE PATHOLOGY, 27 CR

- Grad programs vary in their pre-req. courses they require. You can research pre-requisites through ASHA's EdFind (asha.org/edfind/)
- Some courses for the SLP concentration are restricted to CGSC majors.

All of the Following, 21 Credits

LING 253 Laboratory Phonetics	Prereq: LING101, Requires a laptop computer
CGSC 376 Introduction to Communication Disorders	Prereq: LING101
CGSC 378 Anatomy and Physiology of Speech	Prereq: LING101; C or better in CGSC376
CGSC 379 Audiology	Prereq: LING101; C or better in CGSC376
CGSC 380 Clinical Principles & Procedures in SLP*	Prereq: LING101; C or better in CGSC376
	* Requires transportation for observation hrs
CGSC 433 Introduction to Acoustic Phonetics	Prereq: LING253, Requires a laptop computer
CGSC 496 Psycholinguistics	Prereq: LING101

One of the Following, 3 Credits

LING 403 Introduction to Phonology	Prereq: LING101 and LING202
LING 480 Sociolinguistics	Prereq: LING101

One of the Following, 3 Credits

LING 444 First Language Development	Prereq: LING101
LING 462 Lang. Acquisition (C/L EDUC& PSYC462)	Prereq: LING101

Recommended Elective Courses:

Not Required for Completion of CGSC BS, but Useful for Graduate School Admissions

- Graduate programs often have a physical science requirement. This can be fulfilled at UD with one of the follow: CHEM 101, CHEM 102, CHEM 103, CHEM 104, CHEM 105, or PHYS 201. Alternatively, a student can take any intro to chemistry or intro to physics course at another institution; no lab required.
- LING 403, if you did not take it as one of your area of specialization courses.
- LING 480, if you did not take it as one of your area of specialization courses.
- ENGL 410: Technical Writing -- OR -- ENGL 415: Writing in the Professions
- HDFS 339: Adult Development and Aging -- OR -- HDFS 405: Aging & the Family
- CGSC310: Orientation to Clinical Experiences: A hands on course that offers guided observation hours
- Work in a lab for independent study credit. Here are some instructions for finding placement in a lab.
 1. Read about the research being done in various labs on campus by visiting faculty web sites in relevant department such as Psychology, Linguistics & Cognitive, and Physical Therapy.
 2. Contact several professors to ask if s/he has space for you to work in his or her lab for credit during the term of interest (fall, winter, summer, or spring). In your email, tell them about yourself (your major, your GPA, your professional goals) as well as the number of credits you would like to receive.
 3. Once you receive positive replies, pick a lab and sign up for an independent studies class with the professor under his or her home department. The number of credits will vary depending on the number of hours worked.