

NEUROSCIENCE & COGNITIVE SCIENCE CURRICULUM

Catalog Years 2018-19, 2019-20

PLEASE NOTE: NSCS has different curriculum requirements depending on your Catalog Year (typically the year you started at UA). Students in catalogs prior to 2018-19 have different requirements than those listed here and should consult the appropriate curriculum sheet. All versions of the NSCS curriculum are available on the NSCS website at nscs.arizona.edu.

UNIVERSITY FOUNDATIONS & GENERAL EDUCATION

English Composition (*two courses or one of honors*)

ENGL 101 – First-Year Composition
 ENGL 102 – First-Year Composition
 or ENGL 109H - Honors Composition

Second Language

Second-semester proficiency
 by credit or exam required

Mathematics

Requirement met with NSCS course work

Tier One General Education

Individuals and Societies (*2 courses*)
 Traditions and Cultures (*2 courses*)

Tier Two General Education

Arts (*3 units*)
 Humanities (*one course*)
 Individuals & Societies (*one course*)

Diversity Emphasis (*Gender/Race/Class/Ethnicity/Sexual Orient./Non Western*)

One undergraduate course must be taken from the Diversity Emphasis list; certain Tier One and Tier Two courses meet this requirement

NSCS FOUNDATION COURSES

Students are **ELIGIBLE TO APPLY** to the full major when they have met the following requirements:

- Completed MCB 181R/L, CHEM 151, and PSY 101 or 150A1 (*pre-req for NSCS 200*). These courses must be completed before taking NSCS 200
- Completed or enrolled in calculus and statistics
- Completed or enrolled in CHEM 152 (*for neurosci focus*) or one course from the foundation focus (*for cognitive sci focus*)
- Science GPA of at least 2.5
- Enrolled in NSCS 200

(*Physics, organic chemistry [neuro focus], & PHIL 241 may be completed before or after admission to the major*)

Chemistry (*4 units for cog sci; 12 units for neuro*)

CHEM 151 – General Chemistry I (*4*)

Neuroscience Focus Only

CHEM 152 – General Chemistry II (*4*)
 CHEM 241A – Organic Chemistry (*3*)
 CHEM 243A – Organic Chemistry Lab (*1*)

Biology

MCB 181R – Introductory Biology I (*3*)
 MCB 181L – Introductory Lab I (*1*)

Physics (*4 units for cog sci; 8 units for neuro*)

PHYS 102 – Introductory Physics I (*3*)
 PHYS 181 – Intro Lab I (*1*)
 or PHYS 141 – Intro Mechanics (*4*)

Neuroscience Focus Only

PHYS 103 – Introductory Physics II (*3*)
 PHYS 182 – Intro Lab II (*1*)
 or PHYS 241 – Intro Elect & Magnetism (*4*)

Mathematics

MATH 122A&B – First Semester Calculus (*5*)
 or MATH 125 – Calculus I (*3*)

Statistics (*choose one – MATH 263 recommended for pre-health students*)

MATH 263 – Introduction to Statistics and Biostatistics (*3*)
 or PSY 230 – Psychological Measurement and Statistics (*3*)

Philosophy

PHIL 241 – Consciousness and Cognition (*3*)

Cognitive Science Focus Only

Take 3 courses from at least two categories

Cognitive Psychology

Linguistics

Philosophy

See last page for course listing

NSCS GATEWAY COURSE (APPLY TO THE MAJOR WHILE ENROLLED)

Students typically apply to the NSCS major while enrolled in NSCS 200 and, if accepted to the major, must successfully complete NSCS 200 with a grade of B or higher to be officially admitted to the major. Admission to the NSCS major is competitive.

| Course | Units | Typically Offered | Prerequisites |
|---|-------|-------------------|---------------------------------|
| NSCS 200 – Fundamentals of Neuroscience & Cognitive Science | 3 | Spring | MCB 181R/L and PSY 101 or 150A1 |

NSCS MAJOR CORE COURSES (TAKE ONLY AFTER NSCS 200 HAS BEEN COMPLETED)

| <i>Course</i> | <i>Units</i> | <i>Typically Offered</i> | <i>Prerequisites</i> |
|--|--------------|--------------------------|---------------------------------|
| NSCS 307 – Cellular Neurophysiology (<i>Honors section available</i>) | 3-4 | Fall only | NSCS 200, MCB 181R/L, CHEM 151 |
| NSCS 308 – Methods in Neuroscience | 1 | Fall only | NSCS 200 |
| NSCS 311 – Scientific Programming with MATLAB | 3 | Fall only | N/A |
| NSCS 320 – Issues and Themes in Cognitive Science | 3 | Fall only | NSCS 200, PSY 101 or 150A1 |
| NSCS 321 – Methods in Cognitive Science | 1 | Fall only | NSCS 200 |
| Neuroscience Focus Only | | | |
| NROS 310 – Molecular & Cellular Bio of Neurons (<i>Honors section</i>) | 3-4 | Spring only | NSCS 200, MCB 181R/L, CHEM 151 |
| NROS 418 – Fundamental Principles in Systems Neuroscience | 3 | Spring only | NSCS 200, NROS 307 |
| Cognitive Science Focus Only | | | |
| NSCS 344 – Modeling the Mind: Comp Models of Cognition | 3 | Spring only | Statistics and NROS 311 |
| Take TWO of the following courses (cannot double-dip as emphasis electives) | | | |
| ECOL 346 – Bioinformatics | 4 | Spring | ECOL 320 or ECOL 326 or MCB 304 |
| ISTA 457 – Neural Networks | 3 | Spring | NSCS 344, MATH 313 rec |
| LING 432 – Psychology of Language | 3 | Fall, Spring, Sum | LING 201 or PSY 101 |
| LING 440 – The Bilingual Mind | 3 | Spring | LING 201 or PSY 325 or PSY 360 |
| NROS 412 – Molecular Mechanisms of Learning and Memory | 3 | Fall | NROS 307 |
| PHIL 346 – Minds, Brains & Computers | 3 | Fall, Spring, Sum | None listed |
| PHIL 439 – Decision Theory | 3 | Spring | PHIL 241 |
| PHIL 442 – Knowledge and Cognition | 3 | Fall and Spring | PHIL 241 |
| PSY 313 – Drugs and the Brain | 3 | Varies | PSY 101 or PSY 150A1 and stats |
| PSY 321 – Brain Rehabilitation | 3 | Fall, Spring | PSY 101 or PSY 150A1 |
| PSY 333 – Judgment and Decision-Making | 3 | Spring | PSY 101 or PSY 150A1 |
| PSY 340 – Introduction to Cognitive Development | 3 | Fall, Spring, Sum | PSY 101 or PSY 150A1 |
| PSY 405 – Developmental Cognitive Neuroscience | 3 | Fall | PSY 101 or PSY 150A1 |
| PSYS 407 – Language and Thought: A Cognitive Psychology/Neuroscience Perspective | 3 | Fall, Spring | PSY 101 or PSY 150A1 |
| PSY 412 – Animal Learning | 3 | Fall | PSY 101 or PSY 150A1 |
| PSY 422 – Introduction to Brain Connectivity | 3 | Fall, Spring | PSY 101 or PSY 150A1 |
| PSY 426 – Advanced Human Memory | 3 | Every other Fall | PSY 300 or PSY 325 or PSY 326 |
| PSY 429 – Advanced Perception | 3 | Varies | PSY 101 or PSY 150A1 |
| PSY 433 – Neuroeconomics (Decisions & the Brain – new title 2019) | 3 | Fall | PSY 101 or PSY 150A1 & NSCS 200 |
| PSY 478 – Sleep and Sleep Disorders | 3 | Spring | PSY 101 or PSY 150A1 |
| PSY 496F – Cognitive Psychology | 3 | Spring | PSY 101 or PSY 150A1 |

NSCS EMPHASIS ELECTIVES

Choose one emphasis from the options listed on the NSCS Emphasis Course List and complete 15 units from your selected emphasis. The NSCS Emphasis Course List can be found on the NSCS website. A maximum of 6 units of upper-division research, internship, preceptorship (max 3 units) or honors thesis credit can be applied to any emphasis. PLEASE NOTE: Some courses are listed in more than one area of the NSCS curriculum (ie: focus and emphasis). The same course cannot be used to fulfill more than one requirement; separate courses must be taken to fulfill each requirement.

Cognition

Computation

Development and Aging

Language and Communication Science

Neurobiology

Philosophy of Mind

Thematic

NSCS SPECIAL LECTURE AND PROGRAM ASSESSMENT REQUIREMENTS

NSCS offers two special lectures each year, one on **Ethics** and one on **Science Policy**. NSCS students are required to attend at least one Ethics and one Science Policy lecture during their time in the NSCS program in order to graduate. Students who have not completed this requirement by the time they are ready to graduate will be required to complete a make-up assignment for each lecture that they missed.

NSCS students are required to participate in an **NSCS Program Assessment** session after completion of these four core courses: NSCS 307, NSCS 308, NSCS 320 and NSCS 321.

| Additional Graduation Requirements | |
|--|-----------------------------|
| <i>(Minimum limits)</i> | |
| 120 Total Units | 42 Upper Division Units |
| 2.0 Cumulative GPA | 2.0 Major GPA |
| 30 Units Taken at UA | 18 NSCS Units Taken at UofA |
| 18 of Final 30 Units Taken at UofA | |
| Mid-Career Writing Assessment (MCWA) Satisfied | |

COGNITIVE SCIENCE FOUNDATION FOCUS COURSE LISTING

Students in the Cognitive Science Focus must choose 3 courses from at least two of the following categories to complete the Cognitive Science Foundation Focus requirements.

| <i>Course</i> | <i>Units</i> | <i>Typically Offered</i> | <i>Prerequisites</i> |
|---|--------------|--------------------------|----------------------------------|
| COGNITIVE PSYCHOLOGY | | | |
| LING 440 – The Bilingual Mind | 3 | Spring | LING 201 or PSY 325 or PSY 360 |
| PSY 333 – Judgement and Decision-Making | 3 | varies | PSY 101 or PSY 150A1 and stats |
| PSY 340 – Intro to Cognitive Development | 3 | Fall, Spring, Sum | PSY 101 or PSY 150A1 |
| PSY 426 – Advanced Human Memory | 3 | Every other Fall | PSY 325 or PSY 326 or PSY 300 |
| PSY 429 – Advanced Perception | 3 | varies | PSY 101 or PSY 150A1 |
| LINGUISTICS | | | |
| LING 201 – Introduction to Linguistics | 3 | Fall, Spring, Sum | None |
| LING 341 – Language Development | 3 | Fall, Spring, Sum, Win | PSY 101 or PSY 150A1 |
| LING 432 – Psychology of Language | 3 | Fall, Spring, Sum, Win | PSY 101 or PSY 150A1 or LING 201 |
| LING 449A - Biolinguistics | 3 | Spring | None |
| PHILOSOPHY | | | |
| PHIL 202 – Introduction to Symbolic Logic | 3 | Fall, Spring, Sum | None |
| PHIL 346 – Minds, Brains and Computers | 3 | Fall, Spring | Tier I INDVs completed |
| PHIL 442 – Knowledge and Cognition | 3 | varies | Two PHIL courses |
| PHIL 450 – Philosophy of Mind | 3 | Fall | None |