BACHELOR OF ARTS (BA) DEGREE WITH A MAJOR IN COGNITIVE SCIENCES

Program Learning Outcomes for the BA Degree with a Major in Cognitive Sciences

Upon completing the BA degree with a major in Cognitive Sciences, students will be able to:

1. Understand cognitive science as an interdisciplinary field and demonstrate the ability to synthesize key knowledge, theories, methods, research, and other elements from many related disciplines and bring these interdisciplinary elements to bear on problems or questions in the cognitive sciences.

2. Demonstrate a breadth of knowledge of the key issues, questions, and perspectives at stake in the multiple disciplines that contribute to the study of the cognitive sciences.

3. Achieve a depth of knowledge in one core area of the cognitive sciences – linguistics, neuroscience, philosophy, or psychology – and develop a knowledge base in that discipline, as well as an understanding of the theories, methods, and research approaches in that discipline.

4. Demonstrate the advanced critical thinking skills necessary to evaluate multiple theories or methods from a variety of related disciplines and choose which to apply to a particular problem or question in the cognitive sciences, as well as the advanced critical thinking ability necessary to evaluate the validity of research results that purport to address the same problem or question, but with different results.

5. Demonstrate the ability to communicate original research or research by other scholars effectively and at a college level in written and oral formats.

Requirements for the BA Degree with a Major in Cognitive Sciences

For general university requirements, see Graduation Requirements (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/). Students pursuing the BA degree with a major in Cognitive Sciences must complete:

- A minimum of 14 courses (42-46 credit hours, depending on course selection) to satisfy major requirements.
- A minimum of 120 credit hours to satisfy degree requirements.
- A minimum of 6 courses (18 credit hours) taken at the 300-level or above.
- A maximum of 4 courses (12 credit hours) from study abroad or transfer credit. For additional program guidelines regarding transfer credit, see the Policies tab.
- The requirements for one area of specialization (see below for areas of specialization). When students declare the major (https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/#text) in Cognitive Sciences, students must additionally identify and declare one of four areas of specialization, either in:
  - Linguistics (p. 3), or
  - Neuroscience (p. 3), or
  - Philosophy (p. 4), or
  - Psychology (p. 4).

Because of the common core requirements, it is possible for students to change their area of specialization at any time, even after initially declaring the major. To do so, please contact the Office of the Registrar (registrar@rice.edu).

The courses listed below satisfy the requirements for this major. In certain instances, courses not on this official list may be substituted upon approval of the major’s academic advisor, or where applicable, the department’s Director of Undergraduate Studies. (Course substitutions must be formally applied and entered into Degree Works by the major’s Official Certifier (https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/).) Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td></td>
<td>Total Credit Hours Required for the Major in Cognitive Sciences</td>
<td>42-46</td>
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<tr>
<td></td>
<td>Total Credit Hours Required for the BA Degree with a Major in Cognitive Sciences</td>
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Degree Requirements

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credit Hours</th>
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<tr>
<td></td>
<td>Core Requirements</td>
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<td>Computer Science Core Course</td>
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<td>Select 1 course from the following:</td>
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<tr>
<td></td>
<td>CAAM 210 INTRODUCTION TO ENGINEERING COMPUTATION</td>
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<td></td>
<td>COMP 130 ELEMENTS OF ALGORITHMS AND COMPUTATION</td>
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<td></td>
<td>COMP 140 COMPUTATIONAL THINKING</td>
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<td>COMP 160 INTRODUCTION TO GAME PROGRAMMING IN PYTHON</td>
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<td></td>
<td>PSYC 342 COMPUTER APPLICATIONS IN PSYCHOLOGY</td>
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<td></td>
<td>Advanced Computing Core Course</td>
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<td></td>
<td>Select 1 course from the following:</td>
<td>3-4</td>
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<tr>
<td></td>
<td>CAAM 415 / THEORETICAL NEUROSCIENCE: FROM CELLS TO LEARNING SYSTEMS</td>
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<td></td>
<td>ELEC 488 / NEUR 415</td>
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<td></td>
<td>COMP 182 ALGORITHMIC THINKING</td>
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<td></td>
<td>DSCI 303 MACHINE LEARNING FOR DATA SCIENCE</td>
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<td></td>
<td>ELEC 478 INTRODUCTION TO MACHINE LEARNING</td>
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<td>NEUR 382 / ELEC 382</td>
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<td>NEUR 383 / BIOE 380</td>
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<td>NEUR 383 / BIOE 380</td>
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<td>PHIL 357 INCOMPLETENESS, UNDECIDABILITY, AND COMPUTABILITY</td>
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<td>Course Code</td>
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<tr>
<td>PSYC 430</td>
<td>COMPUTATIONAL MODELING OF COGNITIVE PROCESSES</td>
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<tr>
<td>STAT 413</td>
<td>INTRODUCTION TO STATISTICAL MACHINE LEARNING</td>
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</table>

**Linguistics Core Course**

Select 1 course from the following:

- PSYC 430
- STAT 413

**Neuroscience Core Course**

Select 1 course from the following:

- BIOS 385
- NEUR 362 / PSYC 362
- NEUR 380 / PSYC 380
- NEUR 411 / PSYC 411
- NEUR 415 / CAAM 415 / ELEC 488
- NEUR 416 / CAAM 416 / ELEC 489
- NEUR 430

**Philosophy Core Course**

Select 1 course from the following:

- PHIL 130
- PHIL 310
- PHIL 330

**Psychology Core Course**

PSYC 203

**Advanced Psychology Core Course**

Select 1 course from the following:

- PSYC 308
- PSYC 309 / LING 309
- PSYC 351
- PSYC 461

**Statistics Core Course**

Select 1 course from the following:

- PSYC 339
- SOSC 302
- STAT 280
- STAT 305

<table>
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<tr>
<th>Course Code</th>
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<tr>
<td>PSYC 308</td>
<td>PSYCHOLOGY OF LANGUAGE</td>
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<tr>
<td>PSYC 461</td>
<td>REASONING, DECISION MAKING, PROBLEM SOLVING</td>
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<tr>
<td>SOSC 302</td>
<td>QUANTITATIVE ANALYSIS FOR THE SOCIAL SCIENCES</td>
</tr>
<tr>
<td>STAT 280</td>
<td>ELEMENTARY APPLIED STATISTICS</td>
</tr>
<tr>
<td>STAT 305</td>
<td>INTRODUCTION TO STATISTICS FOR BIOSCIENCES</td>
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</tbody>
</table>

**Total Credit Hours Required for the Major in Cognitive Sciences**

42-46

**Additional Credit Hours to Complete Degree Requirements**

43-47

**University Graduation Requirements**

31

**Total Credit Hours**

120

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**Footnotes and Additional Information**

*Note: University Graduation Requirements include 31 credit hours, comprised of Distribution Requirements (Groups I, II, and III), FWIS, and LPAP coursework. In some instances, courses satisfying major requirements may additionally meet distribution requirements. Additional Credit Hours to Complete Degree Requirements include general electives, coursework completed as upper-level, residency (hours taken at Rice), and/or any other additional academic program requirements.

1 SOSC 302 requires concurrent enrollment of one of the following lab courses: POLI 102 (political science), PSYC 102 (psychology), or SOCI 102 (sociology). Cognitive Sciences majors are advised to choose PSYC 102 as the concurrent lab course.
Students must complete at least 3 courses (9 credit hours), and no more than 4 courses (12 credit hours) in one Area of Specialization. Students may not use the same course to fulfill both a Core Course requirement and an Area of Specialization requirement.

If the Cognitive Sciences major chooses 3 courses (9 credit hours minimum) to satisfy the Area of Specialization requirement, they must complete a remainder total of 3 courses (9 credit hours minimum) to fulfill the Elective requirement. If the Cognitive Sciences major chooses 4 courses (12 credit hours minimum) to satisfy the Area of Specialization requirement, they must complete a remainder total of 2 courses (6 credit hours minimum) to fulfill the Elective requirement. The courses that are eligible to fulfill the Electives requirement are the same as the courses required to fulfill the Areas of Specialization outside the student's chosen Area of Specialization (listed below), with additional approved elective courses also available (listed above). However, courses used to fulfill the Elective Requirements must come from outside the student's chosen Area of Specialization. For example, if the student's Area of Specialization is Psychology, all Elective courses must come from areas other than Psychology.

Only one of COMP 180 and COMP 182 may be counted toward the Cognitive Sciences major. For example, if COMP 180 was used to satisfy the Advanced Computing Core requirement, COMP 182 cannot be used as an Elective course.

Areas of Specialization

Students must complete the requirements as listed for one of the following areas of specialization as offered by the Cognitive Sciences major. A total of 6 courses (minimum of 18-19 credit hours, depending on course selection) must be taken in the area of specialization and elective requirements. See footnote 3 above.

Area of Specialization: Linguistics

To fulfill the remaining Cognitive Sciences major requirements, students pursuing the Linguistics area of specialization must complete:

- a minimum of 3 courses (9 credit hours) from the Linguistics area of specialization
- 2 courses (6-7 credit hours, depending on course selection) from any area of specialization outside Linguistics (from Neuroscience, Philosophy, or Psychology, or from approved elective coursework listed above)
- 1 course (3-4 credit hours, depending on course selection) from any area of specialization (including Linguistics) or from approved elective coursework (listed above)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tr>
<td>Select 9-12 credit hours from the following:</td>
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<tr>
<td>LING 200 / ANTH 230</td>
<td>INTRODUCTION TO THE SCIENTIFIC STUDY OF LANGUAGE</td>
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<tr>
<td>LING 300 / ANTH 300</td>
<td>LINGUISTIC ANALYSIS</td>
<td>3</td>
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<tr>
<td>LING 301 / ANTH 301</td>
<td>PHONETICS</td>
<td>3</td>
</tr>
<tr>
<td>LING 304</td>
<td>INTRODUCTION TO SYNTAX</td>
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<tr>
<td>LING 306</td>
<td>LANGUAGE, THOUGHT, AND MIND</td>
<td>3</td>
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<tr>
<td>LING 309 / PSYC 309</td>
<td>PSYCHOLOGY OF LANGUAGE</td>
<td>3</td>
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LING 311 / ANTH 323, INTRODUCTION TO PHONOLOGY
LING 315 / PSYC 315, INTRODUCTION TO SEMANTICS
LING 320, ORIGINS AND EVOLUTION OF HUMAN LANGUAGE
LING 325 / PSYC 325, LANGUAGE ACQUISITION
LING 397, SPEECH AND HEARING SCIENCE
LING 400, LINGUISTIC ANALYSIS II
LING 401, ANALYSIS OF SOUND PATTERNS
LING 404, RESEARCH METHODOLOGY AND LINGUISTIC THEORIES
LING 405, DISCOURSE
LING 409, SPECIAL TOPICS
LING 411 / ANTH 411 / NEUR 411, NEUROLINGUISTICS
LING 419, MULTILINGUALISM
LING 427, ADVANCED PHONOLOGY

Footnotes and Additional Information

1. LING 409 only counts toward the Cognitive Sciences major when the topic is related to Cognitive Science. For questions regarding a specific instance of LING 409, consult a CSCI major advisor.

Area of Specialization: Neuroscience

To fulfill the remaining Cognitive Sciences major requirements, students pursuing the Neuroscience area of specialization must complete:

- a minimum of 3 courses (9 credit hours) from the Neuroscience area of specialization
- 2 courses (6-7 credit hours, depending on course selection) from any area of specialization outside Neuroscience (from Linguistics, Philosophy, or Psychology, or from approved elective coursework listed above)
- 1 course (3-4 credit hours, depending on course selection) from any area of specialization (including Neuroscience) or from approved elective coursework (listed above)

Select 9-12 credit hours from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>BIOS 385</td>
<td>FUNDAMENTALS OF CELLULAR AND MOLECULAR NEUROSCIENCE</td>
<td>3</td>
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<tr>
<td>BIOS 442</td>
<td>MOLECULES, MEMORY AND MODEL ANIMALS: METHODS IN BEHAVIORAL NEUROSCIENCE</td>
<td>3</td>
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<tr>
<td>NEUR 306</td>
<td>CONCEPTS OF LEARNING AND MEMORY</td>
<td>3</td>
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<tr>
<td>NEUR 362 / PSYC 362</td>
<td>COGNITIVE NEUROSCIENCE: EXPLORING THE LIVING BRAIN</td>
<td>3</td>
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<tr>
<td>NEUR 380 / PSYC 380</td>
<td>FUNDAMENTAL NEUROSCIENCE SYSTEMS</td>
<td>3</td>
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<tr>
<td>NEUR 382 / ELEC 382</td>
<td>INTRODUCTION TO COMPUTATIONAL NEUROSCIENCE</td>
<td>3</td>
</tr>
<tr>
<td>NEUR 383 / BIOE 380 / ELEC 380</td>
<td>INTRODUCTION TO NEUROENGINEERING: MEASURING AND MANIPULATING NEURAL ACTIVITY</td>
<td>3</td>
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</table>
NEUR 411 / NEUROLINGUISTICS 3
ANTH 411 / LING 411
NEUR 415 / THEORETICAL NEUROSCIENCE: FROM CELLS TO LEARNING SYSTEMS 3
CAAM 415 / NEUR 488
NEUR 416 / NEURAL COMPUTATION 3
CAAM 416 / ELEC 489
NEUR 430 / FUNDAMENTALS OF HUMAN NEUROIMAGING 3
ELEC 484
NEUR 525 / NEUROSCIENCE AND LAW 3
PSYC 366 / METHODS IN SOCIAL COGNITIVE AND AFFECTIVE NEUROSCIENCE 3
PSYC 375 / NEUROPSYCHOLOGY OF LANGUAGE AND MEMORY 3
PSYC 432 / BRAIN AND BEHAVIOR 3

Footnotes and Additional Information
Some of the neuroscience courses are taught by Baylor College of Medicine faculty. Rice - Baylor College of Medicine neuroscience course offerings change frequently. Baylor courses not on the list below may be counted at the discretion of the steering committee. The most up-to-date listing of courses counting as additional courses is found at cogsci.rice.edu (http://cogsci.rice.edu).

Area of Specialization: Psychology
To fulfill the remaining Cognitive Sciences major requirements, students pursuing the Psychology area of specialization must complete:

- a minimum of 3 courses (9-10 credit hours) from the Psychology area of specialization
- 2 courses (6-7 credit hours, depending on course selection) from any area of specialization outside Philosophy (from Linguistics, Neuroscience, or Psychology, or from approved elective coursework (listed above))
- 1 course (3-4 credit hours, depending on course selection) from any area of specialization (including Philosophy) or from approved elective coursework (listed above)

Code Title Credit Hours
Select 9-12 credit hours from the following:
PHIL 130 THE SCIENCES OF THE MIND 3
PHIL 231 ANIMAL MINDS 3
PHIL 310 MATHEMATICAL LOGIC 3
PHIL 330 PHILOSOPHY OF MIND 3
PHIL 345 THEORY OF KNOWLEDGE 3
PHIL 357 INCOMPLETENESS, UNDECIDABILITY, AND COMPUTABILITY 3
PHIL 431 ADVANCED TOPICS IN THE SCIENCES OF THE MIND 3

Area of Specialization: Philosophy
To fulfill the remaining Cognitive Sciences major requirements, students pursuing the Philosophy area of specialization must complete:

- a minimum of 3 courses (9 credit hours) from the Philosophy area of specialization
- 1 course (3-4 credit hours, depending on course selection) from any area of specialization outside Philosophy (from Linguistics, Neuroscience, or Psychology, or from approved elective coursework (listed above))
- 2 courses (6 credit hours) from any area of specialization outside Psychology (from Linguistics, Neuroscience, or Philosophy, or from approved elective coursework (listed above))
- 1 course (3-4 credit hours, depending on course selection) from any area of specialization (including Psychology) or from approved elective coursework (listed above)

Code Title Credit Hours
Select 9-13 credit hours from the following:
PSYC 308 MEMORY 3
PSYC 309 / LING 309 PSYCHOLOGY OF LANGUAGE 3
PSYC 310 PSYCHOLOGY OF AGING 3
PSYC 321 DEVELOPMENTAL PSYCHOLOGY 3
PSYC 325 / LING 325 LANGUAGE ACQUISITION 3
PSYC 340 RESEARCH METHODS - PSYCHOLOGY 4
PSYC 351 PSYCHOLOGY OF PERCEPTION 3
PSYC 362 / NEUR 362 COGNITIVE NEUROSCIENCE: EXPLORING THE LIVING BRAIN 3
PSYC 366 METHODS IN SOCIAL COGNITIVE AND AFFECTIVE NEUROSCIENCE 3
PSYC 370 INTRODUCTION TO HUMAN FACTORS AND ERGONOMICS 3
PSYC 375 NEUROPSYCHOLOGY OF LANGUAGE AND MEMORY 3
PSYC 380 / NEUR 380 / BIOC 380 FUNDAMENTAL NEUROSCIENCE SYSTEMS 3
PSYC 409 METHODS IN HUMAN-COMPUTER INTERACTION 3
PSYC 411 HISTORY OF PSYCHOLOGY 3
PSYC 430 COMPUTATIONAL MODELING OF COGNITIVE PROCESSES 3
PSYC 432 BRAIN AND BEHAVIOR 3
PSYC 441 HUMAN-COMPUTER INTERACTION 3
PSYC 461 REASONING, DECISION MAKING, PROBLEM SOLVING 3
PSYC 462 NON-TRADITIONAL INTERFACES 3
PSYC 463 MEDICAL HUMAN FACTORS 3
PSYC 464 Usability Assessment 3
PSYC 470 ENGINEERING PSYCHOLOGY 3
PSYC 480 ADVANCED TOPICS 1 3

Footnotes and Additional Information
1 PSYC 480 only counts toward the Cognitive Sciences major when the topic is related to Cognitive Science. For questions regarding a specific instance of PSYC 480, consult a CSCI major advisor.

Policies for the BA Degree with a Major in Cognitive Sciences
Transfer Credit
For Rice University's policy regarding transfer credit, see Transfer Credit (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/transfer-credit/). Some departments and programs have...
additional restrictions on transfer credit. The Office of Academic Advising maintains the university's official list of transfer credit advisors on their website: [https://oaa.rice.edu](https://oaa.rice.edu). Students are encouraged to meet with their academic program's transfer credit advisor when considering transfer credit possibilities.

**Program Transfer Credit Guidelines**

Students pursuing the major in Cognitive Sciences should be aware of the following program-specific transfer credit guidelines:

- No more than 4 courses (12 credit hours) of transfer credit from U.S. or international universities of similar standing as Rice may apply towards the major.
- Request for transfer credit will be considered by the program director (and/or the program's official transfer credit advisor) on an individual case-by-case basis.

**Additional Information**

For additional information, please see the Cognitive Sciences website: [https://cogsci.rice.edu/](https://cogsci.rice.edu/).

**Opportunities for the BA Degree with a Major in Cognitive Sciences**

**Academic Honors**

The university recognizes academic excellence achieved over an undergraduate's academic history at Rice. For information on university honors, please see Latin Honors ([https://qa.rice.edu/undergraduate-students/honors-distinctions/university/](https://qa.rice.edu/undergraduate-students/honors-distinctions/university/)) (summa cum laude, magna cum laude, and cum laude) and Distinction in Research and Creative Work ([https://qa.rice.edu/undergraduate-students/honors-distinctions/university/](https://qa.rice.edu/undergraduate-students/honors-distinctions/university/)). Some departments have department-specific Honors awards or designations.

**Honors Program in Cognitive Sciences**

Students with a 3.50 major GPA in Cognitive Sciences and 3.30 overall GPA may apply for the cognitive sciences honors program. Students in the honors program are expected to conduct an independent research project of either one or two semesters under the guidance of a member of the cognitive sciences faculty. Students who wish to enter this program should consult with prospective advisors during their junior year and submit a proposal by the end of the semester preceding the initiation of the project. Typically, this means submitting a proposal by the end of the junior year and beginning the project during the fall of the senior year. Proposal will be reviewed by both the supervisor and the program director. Students who undertake a two-semester project will be allowed to continue into the second semester only if their advisor judges that sufficient progress has been made during the first semester. At the end of a project, honors students are expected to submit a final paper to both their advisor and the program director and make an oral presentation to faculty and students. For more details, please contact the program director.

**Independent Research**

Majors may undertake supervised independent research by enrolling in CSCI 390 or the honors program. Students who wish to take CSCI 390 must complete a CSCI 390 contract and have it approved by their supervisor and the program director prior to the end of the first week of classes. All students taking CSCI 390 also must write a substantive research paper, which is to be submitted to both their advisor and the program director at the end of the semester, and presented in the Rice Undergraduate Research Symposium as a poster. (Copies of the contract form and instructions are available on the “forms” section of the cognitive sciences website.)

**Additional Information**

For additional information, please see the Cognitive Sciences website: [https://cogsci.rice.edu/](https://cogsci.rice.edu/).