BACHELOR OF ARTS (BA) DEGREE WITH A MAJOR IN COMPUTER SCIENCE

Program Learning Outcomes for the BA Degree with a Major in Computer Science

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

1. Be knowledgeable about algorithms and their use. Students will analyze new problems, choose appropriate algorithms for their solutions, and develop analytical skills in the manipulation of algorithms.

2. Demonstrate the ability to design and implement complex software systems. Students will demonstrate skill in their design and implementation and function effectively in teams.

3. Be knowledgeable about programming languages and their use. Students will demonstrate an understanding of distinguishing and mapping two different programming languages.

Requirements for the BA Degree with a Major in Computer Science

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

- A minimum of 17 courses (61 credit hours) to satisfy the major requirements.
- A minimum of 121 credit hours to satisfy degree requirements.
- A minimum of 60 credit hours outside of major requirements.
- A minimum of 10 courses (36 credit hours) at the 300-level or above.

The undergraduate program in computer science has been designed to accommodate a wide range of student interests. The program is sufficiently flexible for a student to customize it to his or her interests. A student can develop a broad educational program that couples computer science education with a variety of other fields in engineering, natural sciences, the humanities, or social sciences. Alternatively, a program might be designed for a student preparing for graduate study in computer science or for a career in computing and information technology.

The undergraduate program consists of required math and science courses; computer science core courses, including introductory courses and upper-level courses ensuring knowledge in a broad range of areas; and computer science electives, which give students the freedom to explore specific interests.

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. 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>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Credit Hours Required for the Major in Computer Science</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>Total Credit Hours Required for the BA Degree with a Major in Computer Science</td>
<td>121</td>
</tr>
</tbody>
</table>

### Degree Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
</table>

#### Core Requirements

**Math and Science Courses:**

- MATH 101 SINGLE VARIABLE CALCULUS I 3
- or MATH 105 AP/OTH CREDIT IN CALCULUS I
- MATH 102 SINGLE VARIABLE CALCULUS II 3
- or MATH 106 AP/OTH CREDIT IN CALCULUS II

**Select 1 from the following:**

- MATH 211 ORDINARY DIFFERENTIAL EQUATIONS AND LINEAR ALGEBRA 3
- MATH 212 MULTIVARIABLE CALCULUS
- MATH 221 HONORS CALCULUS III
- MATH 222 HONORS CALCULUS IV

**Select 1 from the following:**

- ELEC 303 RANDOM SIGNALS IN ELECTRICAL ENGINEERING SYSTEMS 3
- STAT 310 / ECON 307 PROBABILITY AND STATISTICS
- STAT 312 PROBABILITY & STATISTICS FOR ENGINEERS

**Select 1 from the following:**

- CAAM 335 MATRIX ANALYSIS
- MATH 355 LINEAR ALGEBRA
- MATH 354 HONORS LINEAR ALGEBRA

**Computer Science Courses:**

**Select 1 from the following:**

- COMP 130 ELEMENTS OF ALGORITHMS AND COMPUTATION 4
- COMP 140 COMPUTATIONAL THINKING
- COMP 160 INTRODUCTION TO GAME PROGRAMMING IN PYTHON
- COMP 182 ALGORITHMIC THINKING 4
- COMP 215 INTRODUCTION TO PROGRAM DESIGN 4
- ELEC 220 FUNDAMENTALS OF COMPUTER ENGINEERING 4

**COMP 310 ADVANCED OBJECT - ORIENTED PROGRAMMING AND DESIGN 4**

**COMP 321 INTRODUCTION TO COMPUTER SYSTEMS 4**

**COMP 322 / ELEC 323 PROGRAMMING 4**

**COMP 382 REASONING ABOUT ALGORITHMS 4**

**COMP 411 PRINCIPLES OF PROGRAMMING LANGUAGES 4**

or **COMP 412 COMPILER CONSTRUCTION FOR UNDERGRADUATE STUDENTS 4**
Bachelor of Arts (BA) Degree with a Major in Computer Science

COMP 421 / ELEC 421
OPERATING SYSTEMS AND CONCURRENT PROGRAMMING

Elective Requirements
Select 2 Computer Science (COMP) departmental course offerings (a minimum of 3 credit hours each) at the 300-level or higher.

Total Credit Hours Required for the Major in Computer Science

University Graduation Requirements (ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements)

Total Credit Hours

Footnotes and Additional Information
1 Includes coursework completed as distribution credit, FWIS, LPAR, upper-level, residency (hours taken at Rice), 60 hours outside of the major (if applicable), and any additional academic program requirements. The "hours outside of the major" requirement may include all of the above university requirements.
2 Typically, the Math and Science courses are taken during the freshman and sophomore years.
3 At most 1 of these 2 courses may be an independent study project (COMP 390, COMP 490, or COMP 491). Students may take courses at the 500-level, however, departmental approval is required to use a course at the 600-level (or above) as an elective.

Policies for the BA Degree with a Major in Computer Science

Transfer Credit
For Rice University's policy regarding transfer credit, see Transfer Credit (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. Students are encouraged to meet with their academic program's transfer credit advisor when considering transfer credit possibilities.

Departmental Transfer Credit Guidelines
Students pursuing the major in Computer Science should be aware of the following departmental transfer credit guidelines:

- Requests 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 Computer Science website: https://www.cs.rice.edu/.

Opportunities for the BA Degree with a Major in Computer Science

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 (ga.rice.edu/undergraduate-students/honors-distinctions/university) (summa cum laude, magna cum laude, and cum laude) and Distinction in Research and Creative Work (ga.rice.edu/undergraduate-students/honors-distinctions/university). Some departments have department-specific Honors awards or designations.

Fifth-Year Master's Degree Option for Rice Undergraduate Students
Rice students have an option to pursue the Master of Computer Science (MCS) degree by adding an additional fifth year to their four undergraduate years of science and engineering studies. Advanced Rice undergraduate students in good academic standing may apply to the MCS degree program during their junior or senior year. Upon acceptance, depending on course load, financial aid status, and other variables, they may then start taking some required courses of the master's degree program. A plan of study will need to be approved by the student's undergraduate advisor and the MCS program director.

As part of this option and opportunity, Rice undergraduate students:

- must complete the requirements for a bachelor's degree and the master's degree independently of each other (i.e. no course may be counted toward the fulfillment of both degrees).
- should be aware there could be financial aid implications if the conversion of undergraduate coursework to that of graduate level reduces their earned undergraduate credit for any semester below that of full-time status (12 credit hours).
- more information on this Undergraduate - Graduate Concurrent Enrollment opportunity, including specific information on the registration process can be found here (ga.rice.edu/undergraduate-students/academic-opportunities/undergraduate-graduate-concurrent-enrollment).

Additional Information
For additional information, please see the Computer Science website: https://www.cs.rice.edu/.