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 (https://qa.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 (61-62 credit hours, depending on course selection) to satisfy the major requirements.
- A minimum of 120 credit hours to satisfy degree requirements.
- A minimum of 10 courses (36 credit hours) taken 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 a student’s 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 (https://registrar.rice.edu/facstaff/degreeworks/officialcertifier/).) Students and their academic advisors should identify and clearly document the courses to be taken.

Summary

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<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tr>
<td>Total Credit Hours Required for the Major in Computer Science</td>
<td>61-62</td>
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<tr>
<td>Total Credit Hours Required for the BA Degree with a Major in Computer Science</td>
<td>120</td>
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Degree Requirements

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Core Requirements

Math and Science Courses:

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

Select 1 course from the following:

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

Select 1 course from the following:

- ELEC 303 RANDOM SIGNALS IN ELECTRICAL ENGINEERING SYSTEMS
- STAT 310 / ECON 307 PROBABILITY AND STATISTICS
- STAT 312 PROBABILITY & STATISTICS FOR ENGINEERS
- STAT 315 / DSCI 301 PROBABILITY AND STATISTICS FOR DATA SCIENCE

Select 1 course from the following:

- CAAM 334 MATRIX ANALYSIS FOR DATA SCIENCE
- CAAM 335 MATRIX ANALYSIS
- MATH 354 HONORS LINEAR ALGEBRA
- MATH 355 LINEAR ALGEBRA

Computer Science Courses:

Select 1 course from the following:

- COMP 130 ELEMENTS OF ALGORITHMS AND COMPUTATION
- COMP 140 COMPUTATIONAL THINKING
- COMP 160 INTRODUCTION TO GAME PROGRAMMING IN PYTHON
- COMP 182 ALGORITHMIC THINKING
- COMP 215 INTRODUCTION TO PROGRAM DESIGN
- ELEC 220 FUNDAMENTALS OF COMPUTER ENGINEERING
- COMP 310 ADVANCED OBJECT-ORIENTED PROGRAMMING AND DESIGN
- COMP 321 INTRODUCTION TO COMPUTER SYSTEMS
- COMP 322 / ELEC 323 PRINCIPLES OF PARALLEL PROGRAMMING
- COMP 382 REASONING ABOUT ALGORITHMS

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COMP 411  PRINCIPLES OF PROGRAMMING LANGUAGES  4
or COMP 412  COMPILER CONSTRUCTION FOR UNDERGRADUATE STUDENTS

COMP 421 / ELEC 421  OPERATING SYSTEMS AND CONCURRENT PROGRAMMING  4

Elective Requirements
Select 2 courses from departmental (COMP) course offerings (a minimum of 3 credit hours each) at the 300-level or above 2  6

Total Credit Hours Required for the Major in Computer Science  61-62
Additional Credit Hours to Complete Degree Requirements  27-28

University Graduation Requirements (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/)  31

Total Credit Hours  120

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 Typically, the Math and Science courses are taken during the freshman and sophomore years.
2 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
Program Restrictions and Exclusions
Students pursuing the BA Degree with a Major in Computer Science should be aware of the following program restriction:

• As noted in Majors, Minors, and Certificates (https://ga.rice.edu/undergraduate-students/academic-opportunities/majors-minors-certificates/), under Declaring Majors, Minors and Certificates, students may not obtain both a BA and a BS in the same major. Students pursuing the BA Degree with a Major in Computer Science may not additionally pursue the Bachelor of Science in Computer Science (BSCS) Degree.

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. 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 (https://ga.rice.edu/undergraduate-students/honors-distinctions/university/) (summa cum laude, magna cum laude, and cum laude) and Distinction in Research and Creative Work (https://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
In certain situations and with some terminal master’s degree programs, Rice students have an option to pursue a master’s degree by adding an additional fifth year to their four years of undergraduate studies.

Advanced Rice undergraduate students in good academic standing typically apply to the master’s 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 major advisor and the master’s degree 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 (https://ga.rice.edu/undergraduate-students/academic-opportunities/undergraduate-graduate-concurrent-enrollment/).

Rice undergraduate students completing studies in science and engineering may have the option to pursue the Master of Computer Science (MCS) degree. For additional information, students should contact their undergraduate major advisor and the MCS program director.
Additional Information
For additional information, please see the Computer Science website: https://www.cs.rice.edu/.