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://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 (61-62 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

Code	Title	Credit Hours
Total Credit Hours Required for the Major in Computer Science		61-62
Total Credit Hours Required for the BA Degree with a Major in Computer Science		120

Degree Requirements

Code	Title	Credit Hours
Core Requirements		
Math and Science Courses: [1]		
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 course from the following:		*3*
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:		*3-4*
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:		*3*
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:		*4*
COMP 130	ELEMENTS OF ALGORITHMS AND COMPUTATION	
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	PRINCIPLES OF PARALLEL PROGRAMMING	4
COMP 382	REASONING ABOUT ALGORITHMS	4

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/.