BACHELOR OF SCIENCE IN COMPUTER SCIENCE (BSCS) DEGREE

Program Learning Outcomes for the BSCS Degree

Upon completing the BSCS degree, 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.

4. Demonstrate a deep knowledge in a subarea of Computer Science. Students will be able to explain issues in the selected subarea and demonstrate a depth of knowledge.

5. Communicate effectively to a client and user.

Requirements for the BSCS Degree

For general university requirements, see Graduation Requirements (https://ga.rice.edu/undergraduate-students/academic-policies-procedures/graduation-requirements/). Students pursuing the BSCS degree must complete:

- A minimum of 23-25 courses (84-85 credit hours), depending on course selection, to satisfy the major requirements.
- A minimum of 128-129 credit hours, depending on course selection, to satisfy degree requirements.
- A minimum of 14 courses (51 credit hours) taken at the 300-level or above.

The BSCS degree is designed for students who are interested in an in-depth study of computer science to prepare themselves for a professional career in the computing industry.

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>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Credit Hours Required for the Major in Computer Science</td>
<td>84-85</td>
</tr>
<tr>
<td></td>
<td>Total Credit Hours Required for the BSCS Degree</td>
<td>128-129</td>
</tr>
</tbody>
</table>

Degree Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td></td>
<td>Core Requirements</td>
</tr>
</tbody>
</table>

Math and Science Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 101</td>
<td>SINGLE VARIABLE CALCULUS I</td>
</tr>
<tr>
<td>or MATH 105</td>
<td>AP/OTH CREDIT IN CALCULUS I</td>
</tr>
<tr>
<td>MATH 102</td>
<td>SINGLE VARIABLE CALCULUS II</td>
</tr>
<tr>
<td>or MATH 106</td>
<td>AP/OTH CREDIT IN CALCULUS II</td>
</tr>
</tbody>
</table>

Select 1 course from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 211</td>
<td>ORDINARY DIFFERENTIAL EQUATIONS AND LINEAR ALGEBRA</td>
</tr>
<tr>
<td>MATH 212</td>
<td>MULTIVARIABLE CALCULUS</td>
</tr>
<tr>
<td>MATH 221</td>
<td>HONORS CALCULUS III</td>
</tr>
<tr>
<td>MATH 222</td>
<td>HONORS CALCULUS IV</td>
</tr>
</tbody>
</table>

Select 1 course from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEC 303</td>
<td>RANDOM SIGNALS IN ELECTRICAL ENGINEERING SYSTEMS</td>
</tr>
<tr>
<td>STAT 310 / ECON 307</td>
<td>PROBABILITY AND STATISTICS</td>
</tr>
<tr>
<td>STAT 312</td>
<td>PROBABILITY &amp; STATISTICS FOR ENGINEERS</td>
</tr>
<tr>
<td>STAT 315 / DSCI 301</td>
<td>PROBABILITY AND STATISTICS FOR DATA SCIENCE</td>
</tr>
</tbody>
</table>

Select 1 course from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAAM 334</td>
<td>MATRIX ANALYSIS FOR DATA SCIENCE</td>
</tr>
<tr>
<td>CAAM 335</td>
<td>MATRIX ANALYSIS</td>
</tr>
<tr>
<td>MATH 354</td>
<td>HONORS LINEAR ALGEBRA</td>
</tr>
<tr>
<td>MATH 355</td>
<td>LINEAR ALGEBRA</td>
</tr>
</tbody>
</table>

Select 1 from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 101 &amp; PHYS 103</td>
<td>MECHANICS (WITH LAB) and MECHANICS DISCUSSION</td>
</tr>
<tr>
<td>PHYS 111</td>
<td>HONORS MECHANICS (WITH LAB)</td>
</tr>
<tr>
<td>PHYS 125</td>
<td>GENERAL PHYSICS (WITH LAB)</td>
</tr>
</tbody>
</table>

Select 1 from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 102 &amp; PHYS 104</td>
<td>ELECTRICITY &amp; MAGNETISM (WITH LAB) and ELECTRICITY AND MAGNETISM DISCUSSION</td>
</tr>
<tr>
<td>PHYS 112</td>
<td>HONORS ELECTRICITY &amp; MAGNETISM (WITH LAB)</td>
</tr>
<tr>
<td>PHYS 126</td>
<td>GENERAL PHYSICS II (WITH LAB)</td>
</tr>
</tbody>
</table>

Computer Science Courses

Select 1 course from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 130</td>
<td>ELEMENTS OF ALGORITHMS AND COMPUTATION</td>
</tr>
<tr>
<td>COMP 140</td>
<td>COMPUTATIONAL THINKING</td>
</tr>
<tr>
<td>COMP 160</td>
<td>INTRODUCTION TO GAME PROGRAMMING IN PYTHON</td>
</tr>
<tr>
<td>COMP 182</td>
<td>ALGORITHMIC THINKING</td>
</tr>
<tr>
<td>COMP 215</td>
<td>INTRODUCTION TO PROGRAM DESIGN</td>
</tr>
<tr>
<td>ELEC 220</td>
<td>FUNDAMENTALS OF COMPUTER ENGINEERING</td>
</tr>
<tr>
<td>COMP 310</td>
<td>ADVANCED OBJECT-ORIENTED PROGRAMMING AND DESIGN</td>
</tr>
</tbody>
</table>
COMP 321  INTRODUCTION TO COMPUTER SYSTEMS  4
COMP 322 /  ELEC 323  PRINCIPLES OF PARALLEL  4
                        PROGRAMMING    
COMP 382  REASONING ABOUT ALGORITHMS  4
COMP 411  PRINCIPLES OF PROGRAMMING  4
        or COMP 412  COMPILER CONSTRUCTION FOR UNDERGRADUATE  4
                      STUDENTS    
COMP 421 /  ELEC 421  OPERATING SYSTEMS AND CONCURRENT  4
                      PROGRAMMING    

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

Capstone Requirement 3
Design Component
Select 1 course from the following:  4
COMP 410  SOFTWARE ENGINEERING METHODOLOGY
COMP 413  DISTRIBUTED PROGRAM CONSTRUCTION
COMP 460 /  ARTS 460  ADVANCED COMPUTER GAME CREATION
Capstone
In consultation with a major advisor, select additional coursework 11
at the 300-level or above to total a minimum of 11 credit hours

Total Credit Hours Required for the Major in Computer 84-85
Science
Additional Credit Hours to Complete Degree Requirements 4
University Graduation Requirements 31
Total Credit Hours 128-129

Footnotes and Additional Information

Note: University Graduation Requirements include 31 credit hours, 4
comprised of Distribution Requirements (Groups I, II, and III), FWIS, 1
and LPAP coursework. In some instances, courses satisfying major 2
requirements may additionally meet distribution requirements. 2
Additional Credit Hours to Complete Degree Requirements include 4
general electives, coursework completed as upper-level, residency 5
(hours taken at Rice), and/or any other additional academic program 6
requirements.

1  Typically, the Math and Science courses are taken during the  
freshman and sophomore years.
2  At most 1 of these courses may be an independent study project  
(COMP 390, COMP 490, or COMP 491). Departmental approval is  
required to use a 600-level course as an elective.
3  The capstone sequence represents a coherent set of courses  
in a computer science specialization chosen by the student.  
Departmental approval is required for suggested specializations.  
Including the design component, the capstone requires a minimum of  
15 credit hours.

Policies for the 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  
avademic program’s transfer credit advisor when considering transfer  
credit possibilities.

Departmental Transfer Credit Guidelines
Students pursuing the BSCS degree 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 BSCS Degree
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
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 (https://ga.rice.edu/
  undergraduate-students/academic-opportunities/undergraduate-
  graduate-concurrent-enrollment/).

Additional Information
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Science website: https://www.cs.rice.edu/