BACHELOR OF ARTS WITH A MAJOR IN COMPUTER SCIENCE

Bachelor of Arts Degree Program
The bachelor of arts with a major in computer science degree program provides a broad-based liberal arts curriculum for students who wish to augment technical computer knowledge with humanities, social sciences, business, communication, or management skills. Foundation courses focus on mathematics, science, software design and programming, computer systems and architecture, and algorithm design. Additional breadth or depth is afforded by selection of technical track courses that build on the foundations to provide in-depth exposure to a specific field in computer science. The program is designed for those with interests in two or more disciplines, as students must complete a second major or two minors in another academic department. The program also offers a medical preparation option for students interested in pursuing a computer science major with preparation for application to medical school.

Visit the program website (http://www.cs.seas.gwu.edu/bachelor-arts-program) for additional information.

Second Major in Computer Science
Students who are not enrolled in the School of Engineering and Applied Science (SEAS), who are enrolled in a bachelor of arts program and wish to declare a second major in computer science, must apply and be admitted to the computer science program. See the department website (http://www.seas.gwu.edu/department-computer-science) for more information about curriculum requirements for the second major in computer science.

Admission criteria for a second major in computer science
To be considered for admission to the second major in computer science, a student must satisfy the following criteria:

• Prior completion of CSCI 1011, CSCI 1111, CSCI 1121, or CSCI 1112 with a minimum grade of B.

• Prior completion of MATH 1220 and MATH 1221, or MATH 1231 with a minimum grade of B-.

• A minimum overall grade-point average of 3.0 at the time of application to the major.

Application deadline
The application is due no later than the start of the fifth semester of study at GW or completion of the sixtieth credit, whichever comes first. Contact the School of Engineering and Applied Science Undergraduate Advising Office (https://www.seas.gwu.edu/academic-advising) for specific application deadlines.

Credits in residence requirement
• For a second major, at least 24 credits in computer science courses must be completed in SEAS.

Graduation grade-point average criteria
• To satisfactorily complete a second major in computer science, a student must have a minimum grade-point average of 2.2 in all the computer science courses.

REQUIREMENTS

Residency Requirement
As part of a residency requirement, all computer science majors must take a minimum of 30 credits in computer science courses at GW. Should a student pursue an approved study abroad program, credits earned in that program count toward this requirement. For a second major, at least 24 credits in computer science courses must be completed in SEAS.

Recommended program of study

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CSCI 1010</td>
<td>Computer Science Orientation</td>
<td>1</td>
</tr>
<tr>
<td>CSCI 1111</td>
<td>Introduction to Software Development</td>
<td>3</td>
</tr>
<tr>
<td>SEAS 1001</td>
<td>Engineering Orientation</td>
<td>1</td>
</tr>
<tr>
<td>UW 1020</td>
<td>University Writing ¹</td>
<td>4</td>
</tr>
<tr>
<td>Mathematics requirement ¹</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Social sciences elective ²</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>CSCI 1112</td>
<td>Algorithms and Data Structures</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 1311</td>
<td>Discrete Structures I</td>
<td>3</td>
</tr>
<tr>
<td>Mathematics requirement ¹</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Natural or physical sciences with a lab elective ¹</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Social sciences elective ²</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>CSCI 2113</td>
<td>Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 2461</td>
<td>Computer Architecture I</td>
<td>3</td>
</tr>
<tr>
<td>Natural or physical sciences with a lab elective ¹</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Humanities elective ²</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Statistics/linear algebra requirement ³</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>CSCI 2541W</td>
<td>Database Systems and Team Projects</td>
<td>3</td>
</tr>
<tr>
<td>Humanities elective ²</td>
<td></td>
<td>3</td>
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</tbody>
</table>

¹: Includes one mathematics course.
²: Includes a social science course.
³: Includes a statistics course.

1 Bachelor of Arts with a Major in Computer Science
### Bachelor of Arts with a Major in Computer Science

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Second major elective</strong></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Natural or physical sciences with a lab elective</strong></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Unrestricted elective</strong></td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

#### Fifth semester

15 credits

- One of the following computer science restricted electives: 3
- **CSCI 3212** Algorithms 4
- **CSCI 3313** Foundations of Computing 4
- **CSCI 3410** Systems Programming 3
- **CSCI 3411** Operating Systems 4

- Arts elective 3
- Second major elective 3
- Second major elective 3
- Second major elective 3

#### Sixth semester

15 credits

- **CS technical track elective** 5 3
- **Humanities elective** 2 3
- Global or cross-cultural elective 2 3
- Second major elective 3
- Second major elective 3

#### Seventh semester

15 credits

- One of the following computer science restricted electives: (different from the CS restricted elective already taken in fifth semester) 3
- **CSCI 3212** Algorithms 4
- **CSCI 3313** Foundations of Computing 4
- **CSCI 3410** Systems Programming 3
- **CSCI 3411** Operating Systems 4

- **CS technical track elective** 5 3
- Global or cross-cultural elective 2 3
- Second major elective 3
- Second major elective 3

#### Eighth semester

15 credits

- **CS technical track elective** 5 3

1. Course satisfies the University General Education Requirement (http://bulletin.gwu.edu/university-regulations/general-education) in science and writing. UW 1020 must be completed prior to any writing course in the major, including CSCI 2441W or CSCI 2541W. The mathematics requirement can be met by taking MATH 1220 and MATH 1221 or MATH 1231 and MATH 1232.

2. This course should be selected from the Columbian College General Education Curriculum (G-PAC) (https://advising.columbian.gwu.edu/general-education-curriculum). From the G-PAC webpage, select the corresponding types of classes. For example, choose “G-PAC: Global or Cross-cultural” to find the courses that satisfy the “Global and cross-cultural elective”. Two of the natural or physical sciences with lab electives must have a laboratory section.

3. Statistics or linear algebra requirement: The Statistics requirement can be met by choosing APSC 3115, CSCI 3362, CSCI 6362, CSCI 4341, or STAT 4157. The linear algebra requirement can be met by taking one of MATH 2184, CSCI 4342, or EMSE 2705. Students who were admitted prior to fall 2014 may count STAT 1051 and STAT 1053 toward the statistics requirement, if they took the course prior to the spring 2015 semester. Students doing a premedical concentration may substitute the linear algebra requirement with a science course required by the premedical requirements.

4. Unrestricted electives—All students in the BA in computer science program are required to complete four unrestricted elective courses. All courses used to fulfill this requirement must have the explicit, documented approval from the faculty advisor, even when such courses are required for a minor or have transferred to the University as Advanced Placement (AP) credit. Guidance for unrestricted electives is available on the Department of Computer Science website (https://www.cs.seas.gwu.edu).

The following guidelines and/or restrictions apply to selecting courses to satisfy this requirement:

1. Additional CSCI courses numbered above 2461 may count toward this requirement. Students may take a maximum of two research and independent study courses, for which the student must provide documentation of output, such as papers, presentations, or software. For courses from other departments, the student must obtain the approval of the faculty advisor.
2. Approved courses from the SEAS Humanities and Social Science Electives lists may count toward this requirement.

3. Approved courses listed in non-technical track lists may count toward this requirement. However, such courses cannot count toward both the non-technical track requirement and as an unrestricted elective.

4. Computer science courses taught by another department generally do not count toward this requirement. Courses that significantly overlap with, or are not as advanced as, the required content for the computer science degree program do not count toward this requirement. Such courses include, but are not limited to, the following: BADM 2301, EMSE 4197, ISTM 3119, ISTM 4120, ISTM 4121, ISTM 4123, STAT 1051, STAT 1053, and STAT 1129.

5. Courses that significantly overlap with any other course(s) used toward the computer science degree, regardless of the department(s) in which they are taken, may not count toward this requirement.

Because of content overlap among courses in general, some courses may be approved for one student and not for another, based on other courses the student has taken. For example, if a student uses PHYS 1021 toward either the science, math/science, or unrestricted electives requirement, PHYS 1011 may not be used to fulfill this requirement, but PHYS 1011 would count for a student who has not taken PHYS 1021.

Technical Track Requirement. All students in the BA in computer science program are required to take three technical courses (for a minimum of 9 credits) of computer science coursework for their technical track. These courses must have CSCI 2113 as a prerequisite or within their prerequisite chain. The faculty advisor’s documented approval is required before these courses may be applied towards degree completion.

Significant Independent Project. Students pursuing a second major must complete a significant independent project. This requires completion of either (1) a course in the second major that includes a thesis or significant project, or (2) completion of CSCI 4243 and CSCI 4244. The student’s selection is subject to approval of the advisor.