Computer Science, B.A.

Learn more about the Bachelor of Arts in Computer Science.

Temple’s B.A. in Computer Science provides an in-depth study of the science of computing, including mathematical/theoretical foundations as well as systems and application software development. Students are prepared (but not required) to take electives in topics such as artificial intelligence, machine learning, robotics, computer vision, graphics, game programming, bioinformatics, databases, big data, mobile and web application development, cloud computing, high performance computing, wireless and sensor networks, network and information security, and digital forensics. Students who select the B.A. in Computer Science can often have a second major and still be able to graduate within four years. This program is for students with an interest in the fundamentals of computing, who want to apply their computer science knowledge to a second area of interest and/or contribute to innovative research and product development. Our students have careers in software development, systems analysis, and consulting; they are also prepared for graduate study and research in Computer and Information Sciences.

Undergraduate Contact Information:

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Bachelor of Arts

Summary of Requirements for the Degree

1. University Requirements (123 total s.h.)
   • Students must complete all University requirements including those listed below.
   • All Temple students must take a minimum of two writing-intensive courses at Temple as part of their major. The specific writing-intensive course options for this major are:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 3296</td>
<td>Software Design</td>
<td>4</td>
</tr>
<tr>
<td>CIS 4397</td>
<td>Independent Research in Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>CIS 4398</td>
<td>Projects in Computer Science</td>
<td>3</td>
</tr>
</tbody>
</table>

   Students MUST take:

   • Students must complete the General Education (GenEd) requirements.
     • See the General Education section of the Undergraduate Bulletin for the GenEd curriculum.
     • Students who complete CST majors receive a waiver for 2 Science & Technology (GS) and 1 Quantitative Literacy (GQ) GenEd courses.
   • Students must satisfy general Temple University residency requirements.

2. College Requirements
   • 45 Upper Level (2000+) credits within the College of Science & Technology (CST), the College of Liberal Arts (CLA), or the College of Engineering (ENG).
   • 90 credits within the College of Science & Technology (CST), the College of Liberal Arts (CLA), or the College of Engineering (ENG).
   • Two (2) Upper Level (2000+) Liberal Art courses.
   • Second (2nd) Level of a Foreign Language (1002).
   • All students in the College of Science and Technology are required to take a one credit first year seminar. SCTC 1001 CST First Year Seminar is the appropriate course option for every entering first year CST major. Transfer students should use SCTC 2001 CST Transfer Seminar to fulfill this requirement. Other courses that fulfill this requirement may be found on the CST College Requirements page.

3. Major Requirements for Bachelor of Arts (55 s.h.)
   At least 7 courses required for the major must be completed at Temple. At least 5 CIS courses must be completed at Temple.
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Computer &amp; Information Science courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIS 1001</td>
<td>Introduction to Academics in Computer Science</td>
<td>1</td>
</tr>
<tr>
<td>CIS 1051</td>
<td>Introduction to Problem Solving and Programming in Python</td>
<td>4</td>
</tr>
<tr>
<td>or CIS 1057</td>
<td>Computer Programming in C</td>
<td></td>
</tr>
<tr>
<td>CIS 1068</td>
<td>Program Design and Abstraction</td>
<td>4</td>
</tr>
<tr>
<td>or CIS 1968</td>
<td>Honors Program Design and Abstraction</td>
<td></td>
</tr>
<tr>
<td>CIS 1166</td>
<td>Mathematical Concepts in Computing I</td>
<td>4</td>
</tr>
<tr>
<td>or CIS 1966</td>
<td>Honors Mathematical Concepts in Computing I</td>
<td></td>
</tr>
<tr>
<td>CIS 2107</td>
<td>Computer Systems and Low-Level Programming</td>
<td>4</td>
</tr>
<tr>
<td>CIS 2166</td>
<td>Mathematical Concepts in Computing II</td>
<td>4</td>
</tr>
<tr>
<td>CIS 2168</td>
<td>Data Structures</td>
<td>4</td>
</tr>
<tr>
<td>CIS 3207</td>
<td>Introduction to Systems Programming and Operating Systems</td>
<td>4</td>
</tr>
<tr>
<td>CIS 3223</td>
<td>Data Structures and Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>CIS 3296</td>
<td>Software Design</td>
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</tr>
<tr>
<td>or CIS 4398</td>
<td>Projects in Computer Science</td>
<td></td>
</tr>
<tr>
<td><strong>Mathematics courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MATH 1041</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 1941</td>
<td>Honors Calculus I</td>
<td></td>
</tr>
<tr>
<td>MATH 1042</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 1942</td>
<td>Honors Calculus II</td>
<td></td>
</tr>
<tr>
<td><strong>Laboratory Science courses</strong></td>
<td></td>
<td></td>
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<tr>
<td>Two (2) laboratory science courses</td>
<td></td>
<td>8</td>
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<tr>
<td><strong>Total Credit Hours</strong></td>
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<td>55</td>
</tr>
</tbody>
</table>

1. Must select one Lab Science Sequence from the options listed below. Lab Science A and Lab Science B must be taken from the same department.

### Sequenced Computer Science BA Laboratory Science Requirements

#### Biology Sequence

Select one Biology Lab Science A:

- BIOL 1011 General Biology I
- BIOL 1111 Introduction to Organismal Biology
- BIOL 1911 Honors Introduction to Organismal Biology (S)

Select one Biology Lab Science B:

- BIOL 1012 General Biology II
- BIOL 2112 Introduction to Cellular and Molecular Biology
- BIOL 2912 Honors Introduction to Cellular and Molecular Biology (F)

#### Chemistry Sequence

Select one Chemistry Lab Science A:

- CHEM 1021 Introduction to Chemistry I
  & CHEM 1031 General Chemistry I
  & CHEM 1051 Honors General Chemical Science I
  & CHEM 1023 and Introduction to Chemistry Laboratory I
  & CHEM 1033 and General Chemistry Laboratory I
  & CHEM 1951 and Honors Chemical Science Laboratory I (F)

Select one Chemistry Lab Science B:

- CHEM 1022 and Introduction to Chemistry Laboratory II
CHEM 1032 & CHEM 1034
General Chemistry II
and General Chemistry Laboratory II
CHEM 1952 & CHEM 1954
Honors General Chemical Science II
and Honors Chemical Science Laboratory II (S)

Earth & Environmental Science Sequence 2

Select this Lab Science A:
EES 2001 Physical Geology

Select one Lab Science B:
EES 2011 Mineralogy I (with CHEM 1031 prerequisite)
EES 2021 Sedimentary Environments (no CHEM 1031 prerequisite)
EES 2061 Introduction to Geochemistry (with CHEM 1031 prerequisite)

Physics Sequence 3

Select one Physics Lab Science A:
PHYS 1021 Introduction to General Physics I
PHYS 1061 Elementary Classical Physics I
PHYS 1961 Honors Elementary Classical Physics I (F)
PHYS 2021 General Physics I
PHYS 2921 Honors General Physics I (F)

Select one Physics Lab Science B:
PHYS 1022 Introduction to General Physics II
PHYS 1062 Elementary Classical Physics II
PHYS 1962 Honors Elementary Classical Physics II (S)
PHYS 2022 General Physics II
PHYS 2922 Honors General Physics II (S)

1 Students can choose to mix-and-match the Chemistry Sequence A and B courses. However, they must take at least 1 course from Chemistry Sequence A and 1 from Chemistry Sequence B. Note: Chemistry courses consist of a three-credit lecture plus a one-credit lab.
2 For the EES Sequence, two of the three Lab Science B options require students to take CHEM 1031 as a prerequisite, but EES 2021 does not.
3 Students can choose to mix-and-match the Physics Sequence A and B courses. However, they must take at least 1 course from Physics Sequence A and 1 from Physics Sequence B.

Calculation of Major GPA
Courses listed under the major requirements for the degree will be included in the calculation of the major GPA. Courses that could not apply toward the major as an elective or required course would not be counted in the calculation of the major GPA. This would include CIS 1056, for example.

Distinction in Major
To graduate with Distinction in Major, students are required to have a 3.50 or higher grade point average (GPA) both in the major and overall, as well as be recommended by the department of Computer & Information Sciences.

Suggested Academic Plan
Bachelor of Arts in Computer Science
Requirements for New Students starting in the 2022-2023 Academic Year

Year 1

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 1001 Introduction to Academics in Computer Science</td>
<td>1</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>4</td>
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<tr>
<td>CIS 1051 Introduction to Problem Solving and Programming in Python</td>
<td></td>
</tr>
<tr>
<td>CIS 1057 Computer Programming in C</td>
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<td>MATH 1041 or 1941 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>SCTC 1001 CST First Year Seminar</td>
<td>1</td>
</tr>
<tr>
<td>ENG 0802, 0812, or 0902 Analytical Reading and Writing [GW]</td>
<td>4</td>
</tr>
<tr>
<td>Elective</td>
<td>1</td>
</tr>
<tr>
<td><strong>Term Credit Hours</strong></td>
<td><strong>15</strong></td>
</tr>
</tbody>
</table>
### Year 1

#### Spring
- CIS 1166 or 1966: Mathematical Concepts in Computing I 4
- CIS 1068 or 1968: Program Design and Abstraction 4
- MATH 1042 or 1942: Calculus II 4
- IH 0851 or 0951: Intellectual Heritage I: The Good Life [GY] 3

**Term Credit Hours**: 15

#### Fall
- CIS 2168: Data Structures 4
- IH 0852 or 0952: Intellectual Heritage II: The Common Good [GZ] 3
- GenEd Breadth Course 3
- Elective 3

**Term Credit Hours**: 15

### Year 2

#### Fall
- CIS 2107: Computer Systems and Low-Level Programming 4
- GenEd Breadth Course 3
- GenEd Breadth Course 3
- Elective 1

**Term Credit Hours**: 11

#### Spring
- CIS 2107: Computer Systems and Low-Level Programming 4
- CIS 2166: Mathematical Concepts in Computing II 4
- GenEd Breadth Course 3
- GenEd Breadth Course 3
- Elective 3

**Term Credit Hours**: 16

### Year 3

#### Fall
- CIS 3207: Introduction to Systems Programming and Operating Systems 4
- CS BA Laboratory Science A 4
- GenEd Breadth Course 3
- Elective 3

**Term Credit Hours**: 15

#### Spring
- CIS 3223: Data Structures and Algorithms 3
- CS BA Laboratory Science B 4
- GenEd Breadth Course 3
- Elective 3

**Term Credit Hours**: 16

### Year 4

#### Fall
- CIS 3296: Software Design [WI] 4
- Elective 3
- Elective 3
- Elective 3

**Term Credit Hours**: 16

#### Spring
- Select one of the following: 3
  - CIS 4397: Independent Research in Computer Science [WI] (Capstone course)
  - CIS 4398: Projects in Computer Science [WI]
- Elective 3
- Elective 3
- Elective 3

**Term Credit Hours**: 16
<table>
<thead>
<tr>
<th>Elective</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Term Credit Hours</strong></td>
<td>15</td>
</tr>
<tr>
<td><strong>Total Credit Hours:</strong></td>
<td>123</td>
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</table>