Computer Science, B.A.

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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215-204-2030
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Bachelor of Arts

Summary of Requirements for the Degree

1. University Requirements (123 total s.h.)
   - MATH 0701 (4 s.h.) and/or ENG 0701 (4 s.h.), if required by placement testing.
   - All Temple students must take a minimum of two writing intensive courses at Temple as part of their major: ENG 2696 and either CIS 4397 or CIS 4398.
   - Students must complete the General Education (GenEd) requirements.
     - See the General Education (http://bulletin.temple.edu/undergraduate/general-education) section of the Undergraduate Bulletin for the GenEd curriculum.
     - Students who complete CST majors typically receive a waiver for 2 Science & Technology (GS) and 1 Quantitative Literacy (GQ) GenEd courses.
   - Students must satisfy general Temple University residency requirements (http://bulletin.temple.edu/undergraduate/academic-policies/academic-residency-requirements).

2. College Requirements
   - 45 Upper Level (2000+) credits within the College of Science & Technology (CST) or the College of Liberal Arts (CLA).
   - 90 credits within the College of Science & Technology (CST) or the College of Liberal Arts (CLA).
   - Second (2nd) Level of a Foreign Language (1002).

3. Major Requirements for Bachelor of Arts (54 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.

Computer & Information Science courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS 1001</td>
<td>Introduction to Academics in Computer Science</td>
<td>1</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>4</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>4</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>
</tbody>
</table>
CIS 3223  Data Structures and Algorithms  3
CIS 3238  Software Design  4
CIS 4397  Independent Research in Computer Science  3
or CIS 4398  Projects in Computer Science

Technical Writing course
ENG 2696  Technical Writing  3

Mathematics courses
MATH 1041  Calculus I  4
or MATH 1941  Honors Calculus I
MATH 1042  Calculus II  4
or MATH 1942  Honors Calculus II

Laboratory Science courses
Two (2) laboratory science courses  8

Total Credit Hours  54

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 Biology I
BIOL 1911  Honors Introduction to Biology I (S)
Select one Biology Lab Science B:
BIOL 1012  General Biology II
BIOL 2112  Introduction to Biology II
BIOL 2912  Honors Introduction to Biology II (F)

Chemistry Sequence
Select one Chemistry Lab Science A:
CHEM 1021 & CHEM 1023  Introduction to Chemistry I
& Introduction to Chemistry Laboratory I
CHEM 1031 & CHEM 1033  General Chemistry I
& General Chemistry Laboratory I
CHEM 1951 & CHEM 1953  Honors General Chemical Science I
& Honors Chemical Science Laboratory I (F)
Select one Chemistry Lab Science B:
CHEM 1022 & CHEM 1024  Introduction to Chemistry II
& Introduction to Chemistry Laboratory II
CHEM 1032 & CHEM 1034  General Chemistry II
& General Chemistry Laboratory II
CHEM 1952 & CHEM 1954  Honors General Chemical Science II
& Honors Chemical Science Laboratory II (S)

Earth & Environmental Science Sequence
Select this Lab Science A:
EES 2001  Physical Geology
Select one Lab Science B (both have co-requisite):
EES 2011  Mineralogy I (with CHEM 1031 co-requisite)
EES 2061  Introduction to Geochemistry (with CHEM 1031 co-requisite)

Physics Sequence
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. The Earth & Environmental Science (EES) sequence will require students to take CHEM 1031 as a co-requisite to either of the two EES Sequence B courses.

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 2017-2018 Academic Year

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
</tr>
<tr>
<td>CIS 1001</td>
<td>Introduction to Academics in Computer Science</td>
</tr>
<tr>
<td>CIS 1068 or 1968</td>
<td>Program Design and Abstraction</td>
</tr>
<tr>
<td>MATH 1041 or 1941</td>
<td>Calculus I</td>
</tr>
<tr>
<td>General Education/Elective Courses</td>
<td>7</td>
</tr>
<tr>
<td><strong>Term Credit Hours</strong></td>
<td>16</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
</tr>
<tr>
<td>CIS 1166 or 1966</td>
<td>Mathematical Concepts in Computing I</td>
</tr>
<tr>
<td>MATH 1042 or 1942</td>
<td>Calculus II</td>
</tr>
<tr>
<td>General Education/Elective Credits</td>
<td>7</td>
</tr>
<tr>
<td><strong>Term Credit Hours</strong></td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year 2</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
</tr>
<tr>
<td>CIS 2168</td>
<td>Data Structures</td>
</tr>
<tr>
<td>ENG 2696</td>
<td>Technical Writing [WI]</td>
</tr>
<tr>
<td>General Education/Elective Credits</td>
<td>8</td>
</tr>
<tr>
<td><strong>Term Credit Hours</strong></td>
<td>15</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
</tr>
<tr>
<td>CIS 2107</td>
<td>Computer Systems and Low-Level Programming</td>
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<td>7</td>
</tr>
<tr>
<td><strong>Term Credit Hours</strong></td>
<td>15</td>
</tr>
</tbody>
</table>
### Year 3
#### Fall
- **CIS 3207**  
  Introduction to Systems Programming and Operating Systems  
  4
- **CS BA Laboratory Science A**  
  4
- **General Education/Elective Credits**  
  7

  **Term Credit Hours**  
  15

#### Spring
- **CIS 3223**  
  Data Structures and Algorithms  
  3
- **CS BA Laboratory Science B**  
  4
- **General Education/Elective Credits**  
  8

  **Term Credit Hours**  
  15

### Year 4
#### Fall
- **CIS 3238**  
  Software Design  
  4
- **General Education/Elective Credits**  
  12

  **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]
- **General Education/Elective Credits**  
  13

  **Term Credit Hours**  
  16

**Total Credit Hours:**  
123