## Computer Science BA

## Overview

Science and technology are the foundations of our future. The Department of Computer and Information Sciences (CIS) is focused on the understanding of fundamental scientific principles and the application of these principles to solving complex problems, using computing technology.

The Bachelor of Arts 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 BA 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.

Campus Location: Main
Program Code: ST-CSCI-BA

## Distinction in Major

To graduate with distinction in this major, a student must satisfy the following criteria:

- have a minimum 3.50 major GPA and
- have a minimum 3.50 cumulative GPA.


## Undergraduate Contact Information

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Learn more about the Bachelor of Arts in Computer Science.
These requirements are for students who matriculated in academic year 2023-2024. Students who matriculated prior to fall 2023 should refer to the Archives to view the requirements for their Bulletin year.

## Bachelor of Arts Requirements

## Summary of Requirements for the Degree

1. University Requirements ( 123 total s.h.)

- Students must complete all University requirements including those listed below.
- All undergraduate students must complete at least two writing-intensive courses for a total of at least six credits at Temple as part of their major. The specific writing-intensive course options for this major are:

| Code | Title | Credit <br> Hours |
| :--- | :--- | ---: |
| Students MUST take: |  | 4 |
| CIS 3296 | Software Design | 4 |
| The second writing-intensive course can be chosen from: | 3 |  |
| CIS 4397 | Independent Research in Computer Science | 3 |
| CIS 4398 | Projects in Computer Science | 3 |

- 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

- A minimum of 90 total credits within the College of Science \& Technology (CST), the College of Liberal Arts (CLA), and/or the College of Engineering (ENG).
- A minimum of 45 of these credits must be upper-level (courses numbered 2000 and above).
- A minimum of 6 of these credits must be upper-level (courses numbered 2000 and above) CLA credits.
- Successful completion or waiver from the second level of a foreign language.
- Complete a one-credit first-year or transfer seminar.
- SCTC 1001 CST First Year Seminar for every entering first-year CST student.
- SCTC 2001 CST Transfer Seminar for every entering transfer CST student.

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.

| Code Title | Credit |  |
| :--- | :--- | :--- |
|  |  | Hours |

Computer \& Information Science courses

| CIS 1001 | Introduction to Academics in Computer Science | 1 |
| :---: | :---: | :---: |
| CIS 1051 | Introduction to Problem Solving and Programming in Python | 4 |
| or CIS 1057 | Computer Programming in C |  |
| CIS 1068 | Program Design and Abstraction | 4 |
| or CIS 1968 | Honors Program Design and Abstraction |  |
| CIS 1166 | Mathematical Concepts in Computing I | 4 |
| or CIS 1966 | Honors Mathematical Concepts in Computing I |  |
| CIS 2107 | Computer Systems and Low-Level Programming | 4 |
| CIS 2166 | Mathematical Concepts in Computing II | 4 |
| CIS 2168 | Data Structures | 4 |
| CIS 3207 | Introduction to Systems Programming and Operating Systems | 4 |
| CIS 3223 | Data Structures and Algorithms | 3 |
| CIS 3296 | Software Design | 4 |
| CIS 4397 | Independent Research in Computer Science | 3 |
| or CIS 4398 | Projects in Computer Science |  |
| 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 ${ }^{1}$ |  | 8 |
| Total Credit Hours |  | 55 |

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

| Code | Title | Credit <br> Hours |
| :--- | :--- | ---: |
| 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: |  |  |

Select one Biology Lab Science B:
BIOL 1012
General Biology II

| BIOL 1112 | Introduction to Biomolecules, Cells and Genomes |
| :--- | :--- |
| BIOL 1912 | Honors Introduction to Biomolecules, Cells and Genomes |
| BIOL 2112 | Introduction to Cellular and Molecular Biology |
| BIOL 2912 | Honors Introduction to Cellular and Molecular Biology (F) |

## Chemistry Sequence ${ }^{1}$

## Select one Chemistry Lab Science A:

| CHEM 1021 | Introduction to Chemistry I |
| :--- | :--- |
| \& CHEM 1023 | and Introduction to Chemistry Laboratory I |
| CHEM 1031 | General Chemistry I |
| \& CHEM 1033 | and General Chemistry Laboratory I |
| CHEM 1951 | Honors General Chemical Science I |
| \& CHEM 1953 | and Honors Chemical Science Laboratory I (F) |

## Select one Chemistry Lab Science B:

| CHEM 1022 | Introduction to Chemistry II |
| :--- | :--- |
| \& CHEM 1024 | and Introduction to Chemistry Laboratory II |
| CHEM 1032 | General Chemistry II |
| \& CHEM 1034 | and General Chemistry Laboratory II |
| CHEM 1952 | Honors General Chemical Science II |
| \& CHEM 1954 | 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.

Suggested Academic Plan

## Bachelor of Arts in Computer Science

## Suggested Plan for New Students Starting in the 2023-2024 Academic Year

| Year 1 |  |  |
| :---: | :---: | :---: |
| Fall |  | Credit Hours |
| CIS 1001 | Introduction to Academics in Computer Science | 1 |
| Select one of the following: |  | 4 |
| CIS 1051 | Introduction to Problem Solving and Programming in Python |  |
| CIS 1057 | Computer Programming in C |  |
| MATH 1041 or MATH 1941 | Calculus I or Honors Calculus I | 4 |
| SCTC 1001 | CST First Year Seminar | 1 |
| $\begin{aligned} & \text { ENG } 0802 \\ & \text { or ENG } 0812 \\ & \text { or ENG } 0902 \end{aligned}$ | Analytical Reading and Writing or Analytical Reading and Writing: ESL or Honors Writing About Literature | 4 |
| Elective |  | 1 |
|  | Credit Hours | 15 |
| Spring |  |  |
| $\begin{aligned} & \text { CIS } 1166 \\ & \text { or CIS } 1966 \end{aligned}$ | Mathematical Concepts in Computing I or Honors Mathematical Concepts in Computing I | 4 |
| $\begin{aligned} & \text { CIS } 1068 \\ & \text { or CIS } 1968 \end{aligned}$ | Program Design and Abstraction or Honors Program Design and Abstraction | 4 |
| MATH 1042 or MATH 1942 | Calculus II or Honors Calculus II | 4 |
| $\begin{aligned} & \text { IH } 0851 \\ & \quad \text { or IH } 0951 \end{aligned}$ | Intellectual Heritage I: The Good Life or Honors Intellectual Heritage I: The Good Life | 3 |

Credit Hours ..... 15
Year 2
Fall
IH 0852
Data Structures ..... 4
or IH 0952 or Honors Intellectual Heritage II: The Common Good
GenEd Breadth Course ..... 3
Elective ..... 3
Elective ..... 3
Credit Hours ..... 16
Spring
CIS 2107 Computer Systems and Low-Level Programming 4
CIS 2166 Mathematical Concepts in Computing II ..... 4
GenEd Breadth Course ..... 3-4
GenEd Breadth Course ..... 3
Elective ..... 1-0
Credit Hours ..... 15
Year 3
Fall
CIS 3207 Introduction to Systems Programming and Operating Systems ..... 4
CS BA Laboratory Science A ..... 4
Foreign Language 1001 - First Level ..... 4
GenEd Breadth Course ..... 3
Credit Hours ..... 15
Spring
CIS 3223 Data Structures and Algorithms ..... 3
CS BA Laboratory Science B ..... 4
Foreign Language 1002 - Second Level ..... 4
GenEd Breadth Course ..... 3
Elective ..... 2
Credit Hours ..... 16
Year 4
Fall
CIS 3296 Software Design ..... 4
Upper-level CLA Course (numbered 2000 and above) ..... 3
Elective ..... 3
Elective ..... 3
Elective ..... 3
Credit Hours ..... 16
Spring
Select one of the following: ..... 3
CIS 4398 Projects in Computer Science
Upper-level CLA Course (numbered 2000 and above) ..... 3
Elective ..... 3
Elective ..... 3
Elective ..... 3
Credit Hours ..... 15
Total Credit Hours ..... 123

