Introduction to Computer Science

Course Overview

Coming for Back-to-School 2026

Overview

Computer science courses at the high school level prepare students to understand, create, and critically evaluate the technologies that shape modern life. As digital systems influence communication, business, healthcare, government, and daily decision-making, students need more than basic technology skills—they need a foundation in computational thinking, programming, data analysis, cybersecurity, and the ethical implications of emerging technologies. A comprehensive course introduces students to designing algorithms, writing and debugging Python programs, analyzing and visualizing real-world data, understanding how computer systems and networks function, and examining issues such as privacy, artificial intelligence, bias, and digital governance. By integrating technical skills with problem-solving, collaboration, and ethical reflection, high school computer science courses equip students for college, careers, and informed citizenship in an increasingly data-driven and interconnected world.

Introduction to Computer Science will be available early summer for use in Fall Semester 2026.

Introduction to Computer Science Course Description

In this year-long course, students explore how computers work and learn to solve real-world problems through programming. Students begin by developing problem-solving skills and creating step-by-step instructions (algorithms), then translate those ideas into working programs using Python. Along the way, students learn to use variables, loops, conditionals, functions, and files to build their own projects. Students practice testing and debugging their code while learning how to write programs that are clear, organized, and easy for others to use. Beyond coding, students examine how computers store and process information, how the internet and operating systems function, and how cybersecurity helps protect data. The course also introduces data science. Students collect, clean, analyze, and visualize data to identify patterns, make predictions, and communicate their findings. Students are also introduced to basic concepts in machine learning and explore how bias can appear in data. Throughout the course, students consider important topics such as privacy, artificial intelligence, accessibility, and the impact of technology on society—helping them become thoughtful and responsible users of technology.

Course Goals

- Design step-by-step algorithms to solve structured problems.
- Write Python programs that use variables, conditionals, loops, functions, and lists.
- Debug programs using systematic testing strategies.
- Analyze datasets to identify patterns and support conclusions.
- Explain how computer systems, networks, and cybersecurity practices function.
- Evaluate the ethical and societal impacts of computing technologies.

Curriculum Map: Semester A

Unit 1: Algorithms and Computational Thinking
What Is an Algorithm?
Breaking Down Problems
Designing and Implementing Algorithms
Documenting and Expressing Algorithms
Algorithms, Decisions, and Efficiency
Planning and Collaborating in CS Projects
Computational Thinking to Solve Problems
Algorithms and AI
Unit 2: From Algorithms to Code
From Algorithms to Code
Understanding What Code Does
Modifying Code for Better Usability
Writing Code with Tools
Writing Clear and Documented Code
Does the Program Solve the Problem?
Testing and Debugging Strategies
Designing for People and Purposes
Unit 3: Programming Foundations in Python
Using Variables and Data Types
Making Decisions with Code
Repeating Tasks with Loops
Organizing Code with Functions
Working with Lists and Collections
Using Input and Output
Working with Files in Python
Debugging and Fixing Problems
Unit 4: Computer Systems and Cybersecurity
What Is a Computer System?
Using and Troubleshooting Computers
Understanding Binary and Data Storage
How Networks Work
Troubleshooting Network Issues
Introduction to Cybersecurity
Cybersecurity Tools and Techniques
Computing Devices in the Real World
Unit 5: Data and Analysis
How Computers Understand Data
Where Data Comes From
Working with Raw Data
Understanding Metadata and Data Organization
Exploring and Summarizing Data
Making Predictions with Data
Creating and Interpreting Data Visualizations
Using Data to Answer Questions

Curriculum Map: Semester B

Unit 6: Advanced Data and Machine Learning
Advanced Data Types and Bit Representation
Structuring and Storing Data
Preparing Data for Simulations and Models
Using Data to Make Decisions
Exploring Machine Learning and Data Bias
Ethics of Big Data and AI
Creating Insightful Data Presentations
Solving Problems with Data
Unit 7: Computer Systems and Networks
What Makes Up a Computer System?
Understanding Operating Systems
Understanding Networks and the Internet
Diagrams and Layers of Systems
Exploring Embedded and Specialized Systems
Network Design and Performance
Using Troubleshooting Strategies
Security in Computer Systems
Unit 8: Cybersecurity, Privacy, and Governance
Balancing Privacy and Security
Digital Identity and Reputation
Exploring Cybersecurity Threats
Cybersecurity Defenses and Tools
Networks and the Internet as Infrastructure
Policies and Governance of Computing
Ethics in System Design
Technology in Everyday Systems
Unit 9: Computing, Society, and Innovation
The History of Computing
Computing Across Cultures
Computing and Personal Impact
Intellectual Property and Licensing
Accessibility and Inclusive Design
Bias and Fairness in Technology
Evaluating Emerging Technologies
Computing in Careers and Community
Unit 10: Computing and Global Impact
Computing and Public Policy
Digital Citizenship and Behavior
Cyber Ethics and Accountability
Algorithms, Fairness, and Impact
Social Effects of Automation and AI
Environmental Impacts of Computing
Open Source, Sharing, and Innovation
Global and Community Computing Challenges