

## INTRODUCTION TO COMPUTER SCIENCE

*Introduction to Computer Science* provides an entry point into computer science. Through computational thinking and collaboration, students will learn the skills and processes needed to develop computer artifacts, basic coding. Data, security and intellectual property will also be explored. Students will develop an understanding of how computer science impacts their everyday lives and explore a variety of careers in the computer science field.

- DOE Code: 4803
- Recommended Grade Level: Grade 9
- Recommended Prerequisites: None
- Credits: 1 or 2 semester course, 1 credit per semester, 2 credit maximum
- Counts as a Directed Elective or Elective for all diplomas

### Dual Credit

This course provides the opportunity for dual credit for students who meet postsecondary requirements for earning dual credit and successfully complete the dual credit requirements of this course. The Dual Credit crosswalk can be accessed [here](#).

### Career and Technical Student Organizations (CTSOs)

Career and Technical Student Organizations are considered a powerful instructional tool when integrated into Career and Technical Education programs. They enhance the knowledge and skills students learn in a course by allowing a student to participate in a unique program of career and leadership development. Students should be encouraged to participate in Business Professionals of America, DECA, or Future Business Leaders of America, the CTSOs for this area.

## Content Standards

### Domain – Computer Science

**Core Standard 1** Students create an understanding of computer science and explore how it impacts their everyday lives.

#### Standards

- ICS-1.1 Create a definition of computer science and computational thinking.
- ICS-1.2 Demonstrate awareness of the history of computing.
- ICS-1.3 Investigate trends in computer science and their impact on society.
- ICS-1.4 Summarize ethical issues within computer science.

## **Domain – Programming and Development**

**Core Standard 2** Students connect the process of developing a computing artifact (ex. computer application, web application, operating system, artificial intelligence) with the skills needed during the development process to have a better understanding of what it takes to build a computing artifact.

### **Standards**

- ICS-2.1 Use the design process to iteratively develop a computing artifact.
- ICS-2.2 Demonstrate competencies of programming constructs, including: use of data types and variables, control structures (sequencing, looping, branching), and modularity (such as a function).
- ICS-2.3 Understand how abstractions hide implementation details when used in everyday objects.
- ICS-2.4 Use abstraction to manage program complexity (such as a function to create callable code).
- ICS-2.5 Formulate algorithms using programming structures to decompose a complex problem.
- ICS-2.6 Assess a program by testing to verify correct behavior.
- ICS-2.7 Construct a computing artifact that has a user interface.
- ICS-2.8 Produce an artifact that includes rich media.
- ICS-2.9 Illustrate knowledge of good programming practice including the use of conventional standards and comment.

## **Domain – Data**

**Core Standard 3** Students describe the types of data and how it is created, stored, and used by computers.

### **Standards**

- ICS-3.1 Understand how computers represent data, including: text, sound, images, and numbers.
- ICS-3.2 Create data visualizations, models, and simulations.
- ICS-3.3 Evaluate data to better understand the world.
- ICS-3.4 Explore the relationship between information and data.

## **Domain – Computers, Devices, and Other Technologies**

**Core Standard 4** Students analyze computer devices and other technologies to build an understanding of their impact on society and how to use them appropriately.

### **Standards**

- ICS-4.1 Demonstrate understanding of the hardware and operating systems of computers.
- ICS-4.2 Discuss the ethical and appropriate use of computer devices.
- ICS-4.3 Explore the fundamental principles and components of computer networking.
- ICS-4.4 Examine the impact of the Internet on society.
- ICS-4.5 Investigate the use of artificial intelligence by individuals and society.
- ICS-4.6 Investigate innovations in computing, including robotics.

## **Domain – Collaboration**

**Core Standard 5** Students collaborate to complete various tasks.

### **Standards**

- ICS-5.1 Design a solution to a problem by working in a team.
- ICS-5.2 Explore technologies that can be used to collaborate with others of various cultures and career fields.
- ICS-5.3 Utilize a problem solving approach to develop a solution using technology.
- ICS-5.4 Analyze the work of peers and provide feedback.
- ICS-5.5 Program a solution to a problem using pair programming or other methods.

## **Domain – Security and Privacy**

**Core Standard 6** Students will be able to understand the laws and ethical implications of privacy, security, and intellectual property.

### **Standards**

- ICS-6.1 Examine the dynamic between privacy and security.
- ICS-6.2 Explain the privacy concerns related to the collection and generation of data through implicit and explicit processes.
- ICS-6.3 Evaluate the social and emotional implications of privacy in the context of safety, law, and ethics.
- ICS-6.4 Give examples to illustrate how sensitive data can be affected by malware and other attacks.
- ICS-6.5 Recommend security measures to address various scenarios based on factors such as efficiency, feasibility, and ethical implications.
- ICS-6.6 Discuss the laws surrounding intellectual property.

## **Domain – Careers**

**Core Standard 7** Students will investigate various careers within the field of computer science.

### **Standards**

- ICS-7.1 Identify computer science occupations and the roles and responsibilities of each.
- ICS-7.2 Report job outlook, demand, and projected wages for computer science careers.
- ICS-7.3 Explore the job opportunities that are available in computer science.
- ICS-7.4 Investigate post-secondary training opportunities and industry certifications that are available.