Indiana CTE

Computing Foundations for a Digital Age (2024)

Computer Science 4565.D1	1	**Students create an understanding of computer science and explore how it impacts their everyday lives.** 4565.D1.1
	2	**Create a definition of computer science and computational thinking and explore growing and emerging careers in the computer science and information technology fields, as well as how changing technology impacts careers in all sectors.** 4565.D1.2
	3	**Demonstrate awareness of the history of computing.** 4565.D1.3
	4	**Investigate trends in computer science and their impact on society.** 4565.D1.4
	5	**Summarize ethical issues within computer science.** 4565.D1.5
Computers, Devices, and Other Technologies 4565.D2	1	**Students analyze computer devices and other technologies to build an understanding of their impact on society and how to use them appropriately.** 4565.D2.1
	2	**Demonstrate understanding of the hardware and operating systems of computers and identify and analyze aspects such as functionality, cost, size, speed, accessibility, and aesthetics of hardware and software.** 4565.D2.2
	3	**Discuss the ethical and appropriate use of computer devices and examine device usability through several lenses including accessibility, ergonomics, and learnability.** 4565.D2.3
	4	**Explore the fundamental principles and components of computer networking.** 4565.D2.4
	5	**Examine the impact of the Internet on society.** 4565.D2.5
	6	**Investigate the use of artificial intelligence by individuals and society.** 4565.D2.6
	7	**Investigate innovations in computing, including robotics and the Industrial Internet of Things (IIoT).** 4565.D2.7

Programming and Development 4565.D3	1	**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.** 4565.D3.1
	2	**Use the design process to iteratively develop a computing artifact.** 4565.D3.2
	3	**Demonstrate competencies of programming constructs, including use of data types and variables, control structures (sequencing, looping, branching), and modularity (such as a function).** 4565.D3.3
	4	**Understand how abstractions hide implementation details when used in everyday objects.** 4565.D3.4
	5	**Use abstraction to manage program complexity (such as a function to create recallable code).** 4565.D3.5
	6	**Formulate algorithms using programming structures to decompose a complex problem.** 4565.D3.6
	7	**Assess a program by testing to verify correct behavior.** 4565.D3.7
	8	**Construct a computing artifact that has a user interface.** 4565.D3.8
	9	**Produce an artifact that includes rich media (e.g., text, graphics, animations, or video).** 4565.D3.9
	10	**Illustrate knowledge of good programming practice including the use of conventional standards and comments.** 4565.D3.10
Data 4565.D4	1	**Students describe the types of data and how it is created, stored, and used by computers.** 4565.D4.1
	2	**Understand how computers represent data, including text, sound, images, and numbers.** 4565.D4.2
	3	**Create data visualizations, models, and simulations using data collected using computational tools such as surveys.** 4565.D4.3
	4	**Evaluate data to better understand the world.** 4565.D4.4
	5	**Explore the relationship between information and data.** 4565.D4.5
Security and Privacy 4565.D5	1	**Examine the dynamic between privacy and security.** 4565.D5.1
	2	**Explain the privacy concerns related to the collection and generation of data through implicit and explicit processes.** 4565.D5.2

3 **Evaluate the social and emotional implications of privacy in the context of safety, law, and ethics.** 4565.D5.3

4 **Give examples to illustrate how sensitive data can be affected by malware and other attacks.** 4565.D5.4

5 **Recommend security measures to address various scenarios based on factors such as efficiency, feasibility, and ethical implications.** 4565.D5.5

6 **Discuss the laws surrounding intellectual property.** 4565.D5.6

7 **Examine tradeoffs in computing technologies through current events related to broad ideas including privacy, communication, and automation (i.e. driverless cars can increase convenience and reduce accidents, but they are susceptible to hacking. The emerging industry will reduce the number of taxi and ride-share drivers but will create software engineering and cybersecurity jobs).** 4565.D5.7