Nebraska State CST Standards and Indicators crosswalk to Ascend Education course for CompTIA Tech+ FC0-U71

About Ascend Education

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We work with some of the best subject matter experts in the industry, who have real teaching experience, to create our content. This is important to us because as teachers you are the ones in the real instructional setting, with a unique boots-on-the-ground perspective. What you know matters to us, and that perspective is what has driven us to build the courseware solution we have.

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About Content Crosswalk

The content crosswalk presents the NE CST Standards and Indicators in order, listing the standard first, followed by the indicator, and then the presentation of content from the Ascend Education course that covers that indicator and supports the standard. The entirety of the content analysis comes straight from the content in the course and includes content from the text and associated labs that students would be reviewing and completing. The Topic ID used in the crosswalk was derived to index content from the course to facilitate an organized comparison of standard/indicator and available content in the course. For example, Topic ID 6.1.1.1 indicates that the topic is covered in chapter 6, section 1, subsection 1.1.

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Content Crosswalk

CS.HS.1 Demonstrate and describe best practices of computer literacy.

Indicator 1 CS.HS.1.a Interpret potential beneficial and harmful effects of computing innovations and emerging technologies including artificial intelligence.

Topic ID	Topic Summary
1.1.1.1	Introduces AI as a technology that enables machines to perform tasks requiring human intelligence.
1.1.1.2	Explains IoT as a network of interconnected devices for real-time decision-making.
1.1.1.3	Describes VR as immersive digital experiences and AR as overlaying digital info onto the real world.
4.1.1.2	Explains asymmetric encryption used in secure communications, such as email encryption and digital signatures.
6.1.1.1	Defines relational databases and explains their structure using examples from SQL-based systems.
7.1.1.1	Overview of Confidentiality, Integrity, and Availability (CIA Triad).

Indicator 2 CS.HS.1.b Identify and explain how hardware components and software applications meet the needs of the end user.

Topic ID	Topic Summary

1.2.1.1	Covers devices used to input data into computers, such as keyboards, mice, touchpads, and scanners.
1.2.1.2	Describes the CPU as the "brain" of the computer, responsible for executing instructions and performing calculations.
1.2.1.3	Discusses output devices such as monitors, printers, and speakers that display or produce processed data.
1.3.1.1	Defines system software as programs that manage hardware and provide a platform for application software to run.
1.3.2.1	Describes application software as programs designed to perform specific tasks for users, such as word processing or browsing.
1.5.1.1	Defines primary storage (RAM) as temporary storage used by the CPU to hold active data.
1.5.1.2	Describes secondary storage devices, such as hard drives, SSDs, and optical discs, used for long-term data retention.

Indicator 3 CS.HS.1.c Demonstrate effective and efficient searches.

Topic ID	Topic Summary
4.LAB.1	Manage Web Browser Settings Part 1.
4.LAB.2	Manage Web Browser Settings Part 2.

Indicator 4 CS.HS.1.d Select and use appropriate software to complete tasks in a variety of educational and professional settings.

Topic ID	Topic Summary
1.3.1.1	Defines system software as programs that manage the hardware and provide a platform for application software to run.
1.3.2.1	Describes application software as programs designed to perform specific tasks for users, such as word processing, spreadsheets, and web browsers.
5.6.1.1	Explains the use of debugging tools to identify and fix errors in code. Discusses breakpoints, stepping through code, and inspecting variables in a debugger.
4.5.2.1	Explains Data Loss Prevention (DLP) systems, which monitor and control the flow of sensitive information to prevent accidental or intentional data leaks.

Indicator 5 CS.HS.1.e Identify information technologies used in various industries and potential careers in those industries.

Topic ID	Topic Summary
1.1.1.1	Introduces AI as a technology that enables machines to perform tasks typically requiring human intelligence. Examples include speech recognition, visual perception, and decision-making.
1.1.1.2	Explains IoT as a network of interconnected devices that collect and exchange data. Highlights IoT devices, such as smart home appliances and wearable technology, communicating for real-time decision-making.

1.1.1.3 Describes VR as immersive digital experiences and AR as overlaying digital info onto the real world. Discusses their applications in gaming, education, and training.

4.5.2.1 Explains Data Loss Prevention (DLP) systems, which monitor and control the flow of sensitive information to prevent accidental or intentional data leaks.

7.2.1.1 Careers and Uses in Information Technology.

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CS.HS.2 Analyze ethical practices and behaviors of digital citizenship.

Indicator 1 CS.HS.2.a Examine and evaluate cultural, social, and ethical issues associated with information technology.

Topic ID	Topic Summary
1.1.1.1	Introduces AI as a technology that enables machines to perform tasks typically requiring human intelligence. Examples include speech recognition, visual perception, and decision-making.
1.1.1.2	Explains IoT as a network of interconnected devices that collect and exchange data. Discusses how IoT devices, such as smart home appliances and wearable technology, communicate.
4.5.2.1	Explains Data Loss Prevention (DLP) systems, which monitor and control the flow of sensitive information to prevent accidental or intentional data leaks.
4.6.1.1	Describes how organizations develop incident response plans to manage security breaches. Covers steps for detecting, containing, and mitigating security incidents.
8.3.2.1	Ethical Concerns in Device and Network Security.

Indicator 2 CS.HS.2.b Apply digital literacy by assessing the validity, accuracy, and appropriateness of information.

Topic ID	Topic Summary

1.5.2.1	Compares cloud storage with local storage devices like hard drives. Highlights the benefits of cloud storage, such as remote access and scalability, while also discussing concerns over security, privacy, and dependence on internet connectivity.
1.4.1.1	Explains how computers process raw data into meaningful information. Provides examples of how businesses collect and analyze data to gain insights and make informed decisions.
4.5.2.1	Explains Data Loss Prevention (DLP) systems, which monitor and control the flow of sensitive information to prevent accidental or intentional data leaks.
8.4.1.1	Digital Footprint Management and Information Security.

Indicator 3 CS.HS.2.c Describe how algorithms may result in both intentional and unintentional bias.

Topic ID	Topic Summary
1.1.1.1	Introduces AI as a technology that enables machines to perform tasks that typically require human intelligence. Examples include speech recognition, visual perception, and decision-making.
1.1.1.2	Explains IoT as a network of interconnected devices that collect and exchange data. Highlights IoT devices, such as smart home appliances and wearable technology, communicating for real-time decision-making.

4.1.1.2	Explains asymmetric encryption, where a pair of keys (public and private) is used for encryption and decryption. Discusses how it is commonly used in secure communications, such as email encryption and digital signatures.

Indicator 4 CS.HS.2.d Investigate how applications of computing can have legal implications.

Topic ID	Topic Summary
1.1.1.1	Introduces AI as a technology that enables machines to perform tasks that typically require human intelligence. AI is revolutionizing industries such as healthcare and finance.
4.4.1.1	Describes different types of firewalls, including packet-filtering, stateful inspection, and next-generation firewalls, which monitor network traffic and enforce security policies.
4.5.2.1	Explains Data Loss Prevention (DLP) systems, which monitor and control the flow of sensitive information to prevent accidental or intentional data leaks.
4.6.1.1	Describes how organizations develop incident response plans to manage security breaches. Covers steps for detecting, containing, and mitigating security incidents.

Indicator 5 CS.HS.2.e Evaluate safety and security measures for protecting information and managing digital footprints.

Topic ID	Topic Summary

1.7.1.1	Introduces common security threats, including viruses, malware, phishing, and unauthorized access. Emphasizes the importance of protecting data and systems through antivirus software, firewalls, and user education.
1.7.2.1	Explains how user authentication methods, such as passwords and biometrics, are used to verify the identity of users before granting access to systems. Highlights the importance of strong password policies and two-factor authentication (2FA).
4.4.1.1	Describes different types of firewalls, including packet-filtering, stateful inspection, and next-generation firewalls. Explains how firewalls monitor network traffic and enforce security policies to prevent unauthorized access to networks and systems.
4.4.2.1	Explains how VPNs create secure, encrypted tunnels for data transmission over the internet. Discusses the use of VPNs in securing remote access to corporate networks and protecting sensitive information from eavesdropping or interception.
4.4.4.1	Discusses best practices for securing wireless networks, including using WPA3 encryption, disabling SSID broadcasting, and limiting access through MAC address filtering.
4.5.1.1	Defines data encryption at rest as the practice of encrypting data stored on devices or servers to prevent unauthorized access in case of theft or breach.
4.5.1.2	Describes how encryption secures data while it is being transmitted over a network. Discusses protocols such as SSL/TLS for encrypting data during web browsing, email communication, and file transfers.

4.5.3.1 Discusses the importance of encrypting backup data and storing it in secure, offsite locations. Explains how backup security measures ensure data is protected in case of system failure, ransomware attacks, or natural disasters.

CS.HS.3 Apply concepts of information technology.

Indicator 1 CS.HS.3.a Identify and describe computing hardware components.

Topic ID	Topic Summary
1.2.1.1	Covers devices used to input data into computers, such as keyboards, mice, touchpads, and scanners.
1.2.1.2	Describes the CPU as the "brain" of the computer, responsible for executing instructions and performing calculations.
1.2.1.3	Discusses output devices such as monitors, printers, and speakers that display or produce processed data.
1.5.1.1	Defines primary storage (RAM) as temporary storage used by the CPU to hold active data.
1.5.1.2	Describes secondary storage devices, such as hard drives, SSDs, and optical discs, used for long-term data retention.

Indicator 2 CS.HS.3.b Perform operations on digital files stored on local devices and remote/cloud storage.

Topic ID	Topic Summary
1.5.1.2	Describes secondary storage devices, such as hard drives, SSDs, and optical discs, used for long-term data retention.

1.5.2.1	Compares cloud storage with local storage devices like hard drives. Highlights the benefits of cloud storage, such as remote access and scalability.

Indicator 3 CS.HS.3.c Compare and contrast the functions, features, and limitations of different operating systems and utilities.

Topic ID	Topic Summary
1.3.1.1	Defines system software as programs that manage the hardware and provide a platform for application software to run. Operating systems (e.g., Windows, macOS, Linux) control resources like memory, CPU, and input/output devices.
1.3.2.1	Describes application software as programs designed to perform specific tasks for users, such as word processing, spreadsheets, and web browsers.

Indicator 4 CS.HS.3.d Troubleshoot computer hardware and software.

Topic ID	Topic Summary
1.2.1.2	Describes the CPU as the "brain" of the computer, responsible for executing instructions and performing calculations.
1.2.1.3	Discusses output devices such as monitors, printers, and speakers that display or produce processed data.
4.6.2.1	Discusses methods for detecting and removing malware from infected systems, including antivirus software, isolation of infected devices, and restoring data from clean backups.

5.6.1.1	Explains the use of debugging tools to identify and fix errors in code. Discusses breakpoints, stepping through code, and inspecting variables in a debugger to understand the program's behavior at runtime.

Indicator 5 CS.HS.3.e Define components of computer networks.

Topic ID	Topic Summary
1.6.1.1	Describes LANs as networks that connect computers and devices within a limited area, such as a home, school, or office. Explains how LANs allow devices to share resources like printers and internet connections.
1.6.1.2	Defines WANs as networks that cover large geographical areas, connecting multiple LANs together. Provides examples of WANs such as the internet, which enables long-distance communication between devices and networks.
2.1.2.1	Explains the function of routers and switches in directing network traffic. Routers connect different networks (e.g., LAN to WAN), while switches allow devices on the same network to communicate.
2.1.2.2	Covers the role of access points in providing wireless connectivity to devices within a network, and the function of modems in converting digital data into signals for transmission over telephone lines or cable.
7.3.1.1	Communication Systems and Security Protocols.

Indicator 6 CS.HS.3.f Explain how data is sent through the Internet.

Topic ID	Topic Summary

2.4.1.1	Describes how data is broken into small packets for transmission over networks. Explains how packet switching allows for more efficient use of network resources and ensures that data can be transmitted even during network congestion.
2.4.1.2	Covers essential network protocols such as TCP/IP, which govern how data is transmitted and received over the internet. Explains the role of protocols in ensuring that data reaches its destination accurately and securely.
2.3.3.1	Explains the difference between IPv4 and IPv6 addressing schemes. Describes how IP addresses are used to uniquely identify devices on a network and highlights the transition to IPv6 to accommodate the growing number of connected devices.

Indicator 7 CS.HS.3.g Interpret and draw conclusions based on a data set.

Topic ID	Topic Summary
1.4.1.1	Explains how computers process raw data into meaningful information. Provides examples of how businesses collect and analyze data to gain insights and make informed decisions.
5.6.2.1	Introduces unit testing as a method to ensure individual parts (units) of a program work as expected. Explains how to write test cases for functions and methods, and how automated testing frameworks help identify bugs and ensure code reliability during development.

CS.HS.4 Analyze the fundamentals of cybersecurity.

Indicator 1 CS.HS.4.a Describe cryptography, encryption, and ciphers.

Topic ID	Topic Summary
4.1.1.1	Defines symmetric encryption as a method where the same key is used to encrypt and decrypt data. Provides examples like the Advanced Encryption Standard (AES) and explains the use cases for symmetric encryption, such as securing files and network communications.
4.1.1.2	Explains asymmetric encryption, where a pair of keys (public and private) is used for encryption and decryption. Discusses how it is commonly used in secure communications, such as email encryption and digital signatures, and provides examples like RSA.
4.1.1.3	Describes hashing as a one-way encryption method used to generate a unique "fingerprint" for data. Explains its use in verifying data integrity and securing passwords, with common examples such as SHA-256 and MD5.
8.4.2.1	Encryption Protocols, Firewalls, and Anti-Malware.

Indicator 2 CS.HS.4.b Identify methods to protect personal devices, information, and systems.

Topic ID	Topic Summary
1.7.1.1	Introduces common security threats, including viruses, malware, phishing, and unauthorized access. Emphasizes the importance of protecting data and systems through antivirus software, firewalls, and user education.

1.7.2.1	Explains how user authentication methods, such as passwords and biometrics, are used to verify the identity of users before granting access to systems. Highlights the importance of strong password policies and two-factor authentication (2FA).
4.2.1.1	Discusses the role of passwords in authenticating users and controlling access to systems. Explains how password policies, such as requiring a minimum length and complexity, help prevent unauthorized access, but also highlights the risks of weak passwords.
4.2.1.2	Defines multifactor authentication as a method that combines two or more independent credentials (e.g., something you know, something you have, something you are) to verify user identity. Discusses how MFA enhances security by adding extra layers of protection beyond passwords.
4.4.4.1	Discusses best practices for securing wireless networks, including using WPA3 encryption, disabling SSID broadcasting, and limiting access through MAC address filtering.
4.5.1.1	Defines data encryption at rest as the practice of encrypting data stored on devices or servers to prevent unauthorized access in case of theft or breach.
8.2.2.1	Multifactor Authentication, Encryption, VPNs.

Indicator 3 CS.HS.4.c Compare and contrast federal, state, local, and international cybersecurity policies.

Topic ID	Topic Summary

7.6.1.1 Describes the process of developing comprehensive security policies to guide employees and management in protecting information assets.

CS.HS.5 Apply concepts of computational thinking.

Indicator 1 CS.HS.5.a Define the term algorithm and explain its relationship to computational solutions.

Topic ID	Topic Summary
5.2.3.1	Introduces recursion as a programming technique where a function calls itself to solve smaller instances of the same problem. Discusses the base case and the recursive case. Provides examples such as calculating factorials or solving mathematical sequences like the Fibonacci series.
5.1.1.1	Introduces loops as a fundamental programming structure used to repeat tasks multiple times. Describes the use of for loops and while loops, showing how they iterate over sequences like arrays or execute until a condition is met.
5.1.1.2	Explains conditional statements that allow programs to make decisions based on conditions. Covers if-else structures and nested conditions, where specific blocks of code execute depending on whether conditions are true or false.

Indicator 2 CS.HS.5.b Decompose a complex problem into distinct parts.

Topic ID	Topic Summary
5.2.3.1	Introduces recursion as a programming technique where a function calls itself to solve smaller instances of the same problem. Discusses the base case and the recursive case. Provides examples such as calculating factorials or solving mathematical sequences like the Fibonacci series.

5.1.1.1	Introduces loops as a fundamental programming structure used to repeat tasks multiple times. Describes the use of for loops and while loops, showing how they iterate over sequences like arrays or execute until a condition is met.
5.2.1.1	Introduces functions as reusable blocks of code that perform specific tasks. Describes how to define a function with parameters and return values. Discusses the benefits of using functions to simplify programs and promote code reusability.

Indicator 3 CS.HS.5.c Identify and develop computational solutions to problems.

Topic ID	Topic Summary
5.2.1.1	Introduces functions as reusable blocks of code that perform specific tasks. Describes how to define a function with parameters and return values. Discusses the benefits of using functions to simplify programs and promote code reusability.
5.1.1.2	Explains conditional statements that allow programs to make decisions based on conditions. Covers if-else structures and nested conditions, where specific blocks of code execute depending on whether conditions are true or false.
5.1.1.1	Introduces loops as a fundamental programming structure used to repeat tasks multiple times. Describes the use of for loops and while loops, showing how they iterate over sequences like arrays or execute until a condition is met.
5.2.3.1	Introduces recursion as a programming technique where a function calls itself to solve smaller instances of the same problem. Provides examples such as calculating factorials or solving mathematical sequences like the Fibonacci series.

Indicator 4 CS.HS.5.d Define abstraction in terms of computer science and explain how it is used to manage complexity.

Topic ID	Topic Summary
5.4.3.1	Defines encapsulation as the practice of restricting access to an object's internal data and only exposing necessary information through methods. Describes how encapsulation protects data integrity and promotes modular program design.
5.2.1.1	Introduces functions as reusable blocks of code that perform specific tasks. Describes how to define a function with parameters and return values. Discusses the benefits of using functions to simplify programs and promote code reusability.
5.4.1.1	Introduces object-oriented programming (OOP), where programs are built using objects that represent real-world entities. Explains how classes define the structure of objects, including attributes (variables) and methods (functions).

Indicator 5 CS.HS.5.e Represent equivalent data using different encoding schemes.

Topic ID	Topic Summary
6.1.2.3	Covers SQL filtering using WHERE clauses to specify conditions for retrieving data, and sorting data using ORDER BY clauses. Provides examples of how these techniques are used to refine query results based on specific criteria or order.
4.1.1.3	Describes hashing as a one-way encryption method used to generate a unique "fingerprint" for data. Explains its use in verifying data integrity and securing passwords, with common examples such as SHA-256 and MD5.

6.1.3.1 Introduces NoSQL databases, which store unstructured or semi-structured data without predefined schemas. Discusses different types of NoSQL databases, including document stores (e.g., MongoDB) and key-value stores (e.g., Redis).

CS.HS.6 Implement programming literacy practices to create computational artifacts.

Indicator 1 CS.HS.6.a Predict the result or output of code execution.

Topic ID	Topic Summary
5.1.1.1	Introduces loops as a fundamental programming structure used to repeat tasks multiple times. Describes the use of for loops and while loops, showing how they iterate over sequences like arrays or execute until a condition is met.
5.1.1.2	Explains conditional statements that allow programs to make decisions based on conditions. Covers if-else structures and nested conditions, where specific blocks of code execute depending on whether conditions are true or false.
5.1.1.3	Describes switch statements as an alternative to complex if-else chains. Explains how switch statements evaluate a variable against multiple possible values, making the code easier to read and maintain.

Indicator 2 CS.HS.6.b Develop programs that use sequences of statements, variables, loops, and conditionals.

Topic ID	Topic Summary
5.1.1.1	Introduces loops as a fundamental programming structure used to repeat tasks multiple times. Describes the use of for loops and while loops, showing how they iterate over sequences like arrays or execute until a condition is met.

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5.1.1.2	Explains conditional statements that allow programs to make decisions based on conditions. Covers if-else structures and nested conditions, where specific blocks of code execute depending on whether conditions are true or false.
5.2.1.1	Introduces functions as reusable blocks of code that perform specific tasks. Describes how to define a function with parameters and return values.
5.1.1.3	Describes switch statements as an alternative to complex if-else chains. Explains how switch statements evaluate a variable against multiple possible values, making the code easier to read and maintain.

Indicator 3 CS.HS.6.c Design and develop computational artifacts that address personally- or socially-relevant concerns.

Topic ID	Topic Summary
5.4.1.1	Introduces object-oriented programming (OOP), where programs are built using objects that represent real-world entities. Explains how classes define the structure of objects, including attributes (variables) and methods (functions).
1.1.1.1	Introduces AI as a technology that enables machines to perform tasks typically requiring human intelligence. Examples include speech recognition, visual perception, and decision-making. AI is revolutionizing industries such as healthcare and finance.
1.1.1.2	Explains IoT as a network of interconnected devices that collect and exchange data. Highlights how IoT devices, such as smart home appliances and wearable technology, communicate for real-time decision-making.

Indicator 4 CS.HS.6.d Use abstraction to manage complexity or avoid duplication of effort.

Topic ID	Topic Summary
5.2.1.1	Introduces functions as reusable blocks of code that perform specific tasks. Describes how to define a function with parameters and return values.
5.4.3.1	Defines encapsulation as the practice of restricting access to an object's internal data and only exposing necessary information through methods. Describes how encapsulation protects data integrity and promotes modular program design.
5.4.1.1	Introduces object-oriented programming (OOP), where programs are built using objects that represent real-world entities. Explains how classes define the structure of objects, including attributes (variables) and methods (functions).

Indicator 5 CS.HS.6.e Use existing procedures within a program or language based on documentation.

Topic ID	Topic Summary
5.2.1.1	Introduces functions as reusable blocks of code that perform specific tasks. Describes how to define a function with parameters and return values.
5.6.1.1	Explains the use of debugging tools to identify and fix errors in code. Discusses breakpoints, stepping through code, and inspecting variables in a debugger to understand the program's behavior at runtime.
5.1.1.3	Describes switch statements as an alternative to complex if-else chains. Explains how switch statements evaluate a variable against multiple possible values.

Indicator 6 CS.HS.6.f Write documentation describing the function of computational artifacts.

Topic ID	Topic Summary
5.2.1.1	Introduces functions as reusable blocks of code that perform specific tasks. Describes how to define a function with parameters and return values.
5.6.1.1	Explains the use of debugging tools to identify and fix errors in code. Discusses breakpoints, stepping through code, and inspecting variables in a debugger to understand the program's behavior at runtime.
5.4.1.1	Introduces object-oriented programming (OOP), where programs are built using objects that represent real-world entities. Explains how classes define the structure of objects, including attributes (variables) and methods (functions).

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