

# NORTH CAROLINA CAREER AND TECHNICAL EDUCATION STANDARDS

## Computer Science and Information Technology Education

**Grade:** Grade 9 - 12

**Course:** Cybersecurity Essentials **New**

**NCCTE.2020.BC10** - Cybersecurity Essentials

**NCCTE.2020.BC10.01.00** - Understand the foundations of cybersecurity.

**NCCTE.2020.BC10.01.01** - Identify the cybersecurity landscape and how vulnerabilities impact enterprise level IT infrastructure systems.

**NCCTE.2020.BC10.01.02** - Identify the roles performed by major threat actors in modern cyberattacks and their primary motivations.

**NCCTE.2020.BC10.01.03** - Compare various cyberattack types and techniques.

**NCCTE.2020.BC10.01.04** - Explain how DDOS, Wifi exploits, and advanced threat actions are used to perform cyberattacks.

**NCCTE.2020.BC10.01.05** - Compare compliance and security.

**NCCTE.2020.BC10.01.06** - Identify the fundamentals of perimeter-based and Zero Trust network security models.

**NCCTE.2020.BC10.01.07** - Explain how virtualized data center security differs from physical data center security.

**NCCTE.2020.BC10.01.08** - Explain cloud computing security and how it impacts organizational networks.

**NCCTE.2020.BC10.01.09** - Compare various network security devices.

**NCCTE.2020.BC10.02.00** - Understand the cybersecurity gateway.

**NCCTE.2020.BC10.02.01** - Demonstrate knowledge of interconnected technology in daily communication.

**NCCTE.2020.BC10.02.02** - Identify systems that need protection.

**NCCTE.2020.BC10.02.03** - Examine cybersecurity landscape environments, attack threat vectors, exposure vulnerabilities, and risk factors.

**NCCTE.2020.BC10.02.04** - Demonstrate knowledge of physical, logical, and virtual addressing using subnet mask schemes.

**NCCTE.2020.BC10.02.05** - Explain the TCP/IP Model and correctly identify the functions of the specific layers including packet encapsulation and lifecycle.

**NCCTE.2020.BC10.02.06** - Understand common use of cloud, virtualization, storage, backup, and recovery procedures.

**NCCTE.2020.BC10.02.07** - Apply knowledge and skills to plan, design, implement, troubleshoot, and maintain network infrastructure environments.

**NCCTE.2020.BC10.03.00** - Understand cybersecurity essentials.

**NCCTE.2020.BC10.03.01** - Formulate an industry-standard design to protect infrastructure against cybersecurity threats.

**NCCTE.2020.BC10.03.02** - Apply advanced filtering methodologies to protect against all known



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and unknown attack vectors.Â

**NCCTE.2020.BC10.03.03** - Understand the basics of cryptography.

**NCCTE.2020.BC10.03.04** - Demonstrate the ability to assess and harden endpoints based on security policies.

**NCCTE.2020.BC10.03.05** - Identify uses of advanced malware research and analysis to provide enhanced protection for enterprise networks.

**NCCTE.2020.BC10.03.06** - Understand mobile and cloud-based connection technologies.

**Course:** Foundations of Information Technology

**NCCTE.BI10** - Foundations of Information Technology

**NCCTE.BI10.01.00** - Understand Information Technology career pathways and foundation skills.

**NCCTE.BI10.01.01** - Understand information technologies and related career pathways.

**NCCTE.BI10.01.02** - Understand career and workplace expectations.

**NCCTE.BI10.02.00** - Understand the Information Support and Services pathway.

**NCCTE.BI10.02.01** - Understand how computing devices work.

**NCCTE.BI10.02.02** - Understand basic troubleshooting of hardware and software.

**NCCTE.BI10.02.03** - Explore advanced concepts in Information Support and Services.

**NCCTE.BI10.03.00** - Understand the Network Systems pathway.

**NCCTE.BI10.03.01** - Understand the physical components of a network.

**NCCTE.BI10.03.02** - Understand network management.

**NCCTE.BI10.03.03** - Explore advanced concepts in network systems.

**NCCTE.BI10.04.00** - Understand the Web and Digital Communications pathway.

**NCCTE.BI10.04.01** - Understand how multimedia is used on the Web.

**NCCTE.BI10.04.02** - Understand how webpages are created and used.

**NCCTE.BI10.04.03** - Explore advanced concepts in web development.

**NCCTE.BI10.05.00** - Understand the Programming and Software Development pathway.

**NCCTE.BI10.05.01** - Understand software types and uses.

**NCCTE.BI10.05.02** - Understand beginning programming concepts.

**NCCTE.BI10.05.03** - Explore advanced concepts in Programming and Software Development.

**NCCTE.BI10.06.00** - Understand the evolution of information technology and career options in Information Technology.

**NCCTE.BI10.06.01** - Understand the evolution of information technology.

**NCCTE.BI10.06.02** - Understand careers in information technology.

**Course:** CompTIA IT Fundamentals **Updated**

**NCCTE.2020.BI12** - CompTIA IT Fundamentals

**NCCTE.2020.BI12.01.00** - Understand computing basics and computer hardware.

**NCCTE.2020.BI12.01.01** - Understand computing basics.

**NCCTE.2020.BI12.01.02** - Identify the types of computing devices.



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**NCCTE.2020.BI12.01.03** - Identify internal computer system components.

**NCCTE.2020.BI12.01.04** - Identify common computer connector types.

**NCCTE.2020.BI12.01.05** - Identify common peripheral devices.

**NCCTE.2020.BI12.01.06** - Understand safety issues and environmental concepts in computing.

**NCCTE.2020.BI12.01.07** - Understand the value of data and information.

**NCCTE.2020.BI12.01.08** - Understand information technology career pathways. (Supplemental)

**NCCTE.2020.BI12.02.00** - Understand computer software and software development concepts.

**NCCTE.2020.BI12.02.01** - Understand types of software and their uses.

**NCCTE.2020.BI12.02.02** - Understand working with files, folders, and applications.

**NCCTE.2020.BI12.02.03** - Identify programming language categories.

**NCCTE.2020.BI12.02.04** - Understand programming organizational techniques and interpret logic.

**NCCTE.2020.BI12.02.05** - Understand the purpose and use of programming concepts.

**NCCTE.2020.BI12.03.00** - Understand computer workstation setup and issue troubleshooting.

**NCCTE.2020.BI12.03.01** - Identify the steps to set up a basic computer workstation.

**NCCTE.2020.BI12.03.02** - Understand how to back up and restore data.

**NCCTE.2020.BI12.03.03** - Understand troubleshooting hardware and software.

**NCCTE.2020.BI12.03.04** - Identify the factors that influence the computer purchasing decision making process. (supplemental)

**NCCTE.2020.BI12.04.00** - Understand networking.

**NCCTE.2020.BI12.04.01** - Understand network characteristics, data sharing, and storage methods.

**NCCTE.2020.BI12.04.02** - Understand how to install and configure a SOHO router.

**NCCTE.2020.BI12.05.00** - Understand wireless technology and mobile devices.

**NCCTE.2020.BI12.05.01** - Understand how to configure wireless devices.

**NCCTE.2020.BI12.05.02** - Understand the basics of using wireless devices.

**NCCTE.2020.BI12.06.00** - Understand computer security.

**NCCTE.2020.BI12.06.01** - Identify the types of computer security threats.

**NCCTE.2020.BI12.06.02** - Understand computer user account settings to secure computing devices.

**NCCTE.2020.BI12.06.03** - Identify secure web browsing practices.

**NCCTE.2020.BI12.07.00** - Understand database fundamentals

**NCCTE.2020.BI12.07.01** - Understand database concepts and the purpose of a database.

**NCCTE.2020.BI12.07.02** - Identify various database structures.

**NCCTE.2020.BI12.07.03** - Understand methods used to interface with databases.

**Course:** App Development with Swift, Level 1 **New**

**NCCTE.2020.BL53** - App Development with Swift - Level 1

**NCCTE.2020.BL53.01.00** - Understand App Development with Swift (Unit 1).

**NCCTE.2020.BL53.01.01** - Demonstrate the basics of data, operators, and control flow in Swift.



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**NCCTE.2020.BL53.01.02** - Explain documentation, debugging, Xcode, building and running an app, and the Interface Builder.

**NCCTE.2020.BL53.01.03** - Construct a simple flashlight app, Light, a guided project.

**NCCTE.2020.BL53.02.00** - Understand the UIKit (Unit 2)

**NCCTE.2020.BL53.02.01** - Explain Swift strings, functions, structures, collections, and loops.

**NCCTE.2020.BL53.02.02** - Demonstrate the UIKit and how to display data using Auto Layout and stack views.

**NCCTE.2020.BL53.02.03** - Build a word-guessing game app in the guided project, Apple Pie.

**NCCTE.2020.BL53.03.00** - Understand navigation and workflows (Unit 3).

**NCCTE.2020.BL53.03.01** - Outline simple workflows and navigation hierarchies using navigation controllers, tab bar controllers, and segue.

**NCCTE.2020.BL53.03.02** - Explain optionals and enumerations.

**NCCTE.2020.BL53.03.03** - guided project, Personality Quiz, a personalized survey that reveals a fun response to the user

**NCCTE.2020.BL53.04.00** - Understand Tables and Persistence (Unit 4).

**NCCTE.2020.BL53.04.01** - Students find out about scroll views, table views, and building complex input screens.

**NCCTE.2020.BL53.04.02** - Explore how to save data, share data to other apps, and work with images in the user's photo library.

**NCCTE.2020.BL53.04.03** - Apply new skills in the guided project, List, a task-tracking app that allows the user to add, edit, and delete items in a familiar tablebased interface.

**NCCTE.2020.BL53.05.00** - Understand how to work with the web.

**NCCTE.2020.BL53.05.01** - Explain animations, concurrency, and working with the web.

**NCCTE.2020.BL53.05.02** - Apply new skills in guided project, Restaurant, a customizable menu app that displays the available dishes from a restaurant and allows the user to submit an order.

**NCCTE.2020.BL53.06.00** - Create prototype and plan project for new app.

**NCCTE.2020.BL53.06.01** - Design, prototype, and architect new and unique app projects.

**Course:** Microsoft Word and PowerPoint Updated

**NCCTE.2020.BM10** - Microsoft Word and PowerPoint

**NCCTE.2020.BM10.01.00** - Understand basic and intermediate word processing software skills.

**NCCTE.2020.BM10.01.01** - Managing documents and options.

**NCCTE.2020.BM10.01.02** - Managing edits and document layouts.

**NCCTE.2020.BM10.01.03** - Working with objects.

**NCCTE.2020.BM10.01.04** - Inserting and managing tables and lists.

**NCCTE.2020.BM10.01.05** - Managing references and finalizing documents.

**NCCTE.2020.BM10.02.00** - Understand advanced word processing software skills.

**NCCTE.2020.BM10.02.01** - Updating Word settings.

**NCCTE.2020.BM10.02.02** - Modifying and creating document styles and templates.



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**NCCTE.2020.BM10.02.03** - Creating reusable content and custom design elements.

**NCCTE.2020.BM10.02.04** - Creating reference tables and restricting editing.

**NCCTE.2020.BM10.02.05** - Managing document content.

**NCCTE.2020.BM10.02.06** - Creating and managing macros.

**NCCTE.2020.BM10.02.07** - Managing customer lists and creating mailings.

**NCCTE.2020.BM10.03.00** - Understand basic and intermediate presentation software skills.

**NCCTE.2020.BM10.03.01** - Introducing the PowerPoint fundamentals.

**NCCTE.2020.BM10.03.02** - Managing content on slides.

**NCCTE.2020.BM10.03.03** - Adding visuals to presentations.

**NCCTE.2020.BM10.03.04** - Working with advanced visuals.

**NCCTE.2020.BM10.03.05** - Organizing and printing presentations.

**NCCTE.2020.BM10.03.06** - Configuring slideshows.

**NCCTE.2020.BM10.03.07** - Managing slide masters and presentation settings.

**Course:** Microsoft Excel **Updated**

**NCCTE.2020.BM20** - Microsoft Excel

**NCCTE.2020.BM20.01.00** - Understand basic and intermediate spreadsheet software skills.

**NCCTE.2020.BM20.01.01** - Introduction to Excel fundamentals.

**NCCTE.2020.BM20.01.02** - Managing worksheets and workbooks.

**NCCTE.2020.BM20.01.03** - Formatting cells.

**NCCTE.2020.BM20.01.04** - Managing tables and range data.

**NCCTE.2020.BM20.01.05** - Using formulas and functions.

**NCCTE.2020.BM20.01.06** - Getting and transforming data.

**NCCTE.2020.BM20.01.07** - Visualizing data.

**NCCTE.2020.BM20.01.08** - Preparing to print and checking for issues.

**NCCTE.2020.BM20.02.00** - Understand the advanced spreadsheet software skills.

**NCCTE.2020.BM20.02.01** - Managing and formatting data.

**NCCTE.2020.BM20.02.02** - Using advanced formulas.

**NCCTE.2020.BM20.02.03** - Validating and auditing data.

**NCCTE.2020.BM20.02.04** - Analyzing data.

**NCCTE.2020.BM20.02.05** - Using simple macros.

**NCCTE.2020.BM20.02.06** - Using Microsoft PivotTables and Microsoft PivotCharts.

**NCCTE.2020.BM20.02.07** - Collaborating with other people.

**Course:** Microsoft Access **New**

**NCCTE.2020.BM40** - Microsoft Access

**NCCTE.2020.BM40.01.00** - Understand what a database is and how it can be used in business

**NCCTE.2020.BM40.01.01** - Understand core database concepts

**NCCTE.2020.BM40.01.02** - Create database objects



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**NCCTE.2020.BM40.01.03** - Manipulating data

**NCCTE.2020.BM40.01.04** - Understanding data storage

**NCCTE.2020.BM40.01.05** - Administering a database

**NCCTE.2020.BM40.02.00** - Understand basic database software skills using Microsoft Access 2016.

**NCCTE.2020.BM40.02.01** - Database Essentials

**NCCTE.2020.BM40.02.02** - Creating Database Tables

**NCCTE.2020.BM40.02.03** - Working with Tables and Database Records

**NCCTE.2020.BM40.02.04** - Modifying Tables and Fields

**NCCTE.2020.BM40.02.05** - Creating Forms

**NCCTE.2020.BM40.02.06** - Creating Reports

**NCCTE.2020.BM40.02.07** - Creating and Modifying Queries

**NCCTE.2020.BM40.02.08** - Using Controls in Reports and Forms

**NCCTE.2020.BM40.03.00** - Understand advanced database software skills using Microsoft Access 2016.

**NCCTE.2020.BM40.03.01** - Advanced Tables

**NCCTE.2020.BM40.03.02** - Advanced Forms

**NCCTE.2020.BM40.03.03** - Advanced Reports

**NCCTE.2020.BM40.03.04** - Advanced Queries

**NCCTE.2020.BM40.03.05** - Displaying and Sharing Data

**Course:** Network Administration I **Updated**

**NCCTE.2020.BN20** - Network Administration I

**NCCTE.2020.BN20.01.00** - Understand networking concepts.

**NCCTE.2020.BN20.01.01** - Explain the purposes and uses of ports and protocols.

**NCCTE.2020.BN20.01.02** - Explain devices, applications, protocols, and services at their appropriate OSI layers.

**NCCTE.2020.BN20.01.03** - Explain the concepts and characteristics of routing and switching.

**NCCTE.2020.BN20.01.04** - Configure the appropriate IP addressing components.

**NCCTE.2020.BN20.01.05** - Compare the characteristics of network topologies, types, and technologies.

**NCCTE.2020.BN20.01.06** - Implement the appropriate wireless technologies and configurations.

**NCCTE.2020.BN20.01.07** - Summarize cloud concepts and their purposes.

**NCCTE.2020.BN20.01.08** - Explain the functions of network services.

**NCCTE.2020.BN20.02.00** - Understand infrastructure.

**NCCTE.2020.BN20.02.01** - Deploy the appropriate cabling solution.

**NCCTE.2020.BN20.02.02** - Identify the appropriate placement of networking devices on a network and install and configure them.

**NCCTE.2020.BN20.02.03** - Explain the purposes and use cases for advanced networking devices.

**NCCTE.2020.BN20.02.04** - Explain the purposes of virtualization and network storage





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technologies.

**NCCTE.2020.BN20.02.05** - Compare WAN technologies.

**NCCTE.2020.BN20.03.00** - Understand network operations.

**NCCTE.2020.BN20.03.01** - Use appropriate documentation and diagrams to manage the network.

**NCCTE.2020.BN20.03.02** - Compare business continuity and disaster recovery concepts.

**NCCTE.2020.BN20.03.03** - Explain common scanning, monitoring and patching processes and summarize their expected outputs.

**NCCTE.2020.BN20.03.04** - Use remote access methods.

**NCCTE.2020.BN20.03.05** - Identify policies and best practices.

**Course:** Network Administration II **Updated**

**NCCTE.2020.BN22** - Network Administration II

**NCCTE.2020.BN22.01.00** - Understand network security.

**NCCTE.2020.BN22.01.01** - Understand the purposes of physical security devices.

**NCCTE.2020.BN22.01.02** - Explain authentication and access controls.

**NCCTE.2020.BN22.01.03** - Secure a basic wireless network.

**NCCTE.2020.BN22.01.04** - Understand common networking attacks.

**NCCTE.2020.BN22.01.05** - Implement network device hardening.

**NCCTE.2020.BN22.01.06** - Explain common mitigation techniques and their purposes.

**NCCTE.2020.BN22.02.00** - Understand network troubleshooting and tools.

**NCCTE.2020.BN22.02.01** - Explain the network troubleshooting methodology.

**NCCTE.2020.BN22.02.02** - Use the appropriate tool.

**NCCTE.2020.BN22.02.03** - Troubleshoot common wired connectivity and performance issues.

**NCCTE.2020.BN22.02.04** - Troubleshoot common wireless connectivity and performance issues.

**NCCTE.2020.BN22.02.05** - Troubleshoot common network service issues.

**Course:** Network Security I **New**

**NCCTE.2020.BN31** - Network Security I

**NCCTE.2020.BN31.01.00** - Understand threats, attacks and vulnerabilities.

**NCCTE.2020.BN31.01.01** - Analyze indicators of compromise and determine the type of malware.

**NCCTE.2020.BN31.01.02** - Compare types of attacks.

**NCCTE.2020.BN31.01.03** - Explain threat actor types and attributes.

**NCCTE.2020.BN31.01.04** - Explain penetration testing concepts.

**NCCTE.2020.BN31.01.05** - Explain vulnerability scanning concepts.

**NCCTE.2020.BN31.01.06** - Explain the impact associated with types of vulnerabilities.

**NCCTE.2020.BN31.02.00** - Understand technologies and tools.

**NCCTE.2020.BN31.02.01** - Install and configure network components, both hardware and software based, to support organizational security.

**NCCTE.2020.BN31.02.02** - Use appropriate software tools to assess the security posture of an



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organization.

**NCCTE.2020.BN31.02.03** - Troubleshoot common security issues.

**NCCTE.2020.BN31.02.04** - Analyze and interpret output from security technologies.

**NCCTE.2020.BN31.02.05** - Deploy mobile devices securely.

**NCCTE.2020.BN31.02.06** - Implement secure protocols.

**NCCTE.2020.BN31.03.00** - Understand architecture and design.

**NCCTE.2020.BN31.03.01** - Explain use cases and purpose for frameworks, best practices and secure configuration guides.

**NCCTE.2020.BN31.03.02** - Implement secure network architecture concepts.

**NCCTE.2020.BN31.03.03** - Implement secure systems design.

**NCCTE.2020.BN31.03.04** - Explain the importance of secure staging deployment concepts.

**NCCTE.2020.BN31.03.05** - Explain the security implications of embedded systems.

**NCCTE.2020.BN31.03.06** - Understand secure application development and deployment concepts.

**NCCTE.2020.BN31.03.07** - Understand cloud and virtualization concepts.

**NCCTE.2020.BN31.03.08** - Explain how resiliency and automation strategies reduce risk.

**NCCTE.2020.BN31.03.09** - Explain the importance of physical security controls.

**Course:** Network Security II **New**

**NCCTE.2020.BN32** - Network Security II

**NCCTE.2020.BN32.01.00** - Understand identity and access management.

**NCCTE.2020.BN32.01.01** - Compare identity and access management concepts

**NCCTE.2020.BN32.01.02** - Install and configure identity and access services.

**NCCTE.2020.BN32.01.03** - Implement identity and access management controls.

**NCCTE.2020.BN32.01.04** - Differentiate common account management practices.

**NCCTE.2020.BN32.02.00** - Understand risk management

**NCCTE.2020.BN32.02.01** - Explain the importance of policies, plans, and procedures related to organizational security.

**NCCTE.2020.BN32.02.02** - Summarize business impact analysis concepts.

**NCCTE.2020.BN32.02.03** - Explain risk management processes and concepts.

**NCCTE.2020.BN32.02.04** - Follow incident response procedures.

**NCCTE.2020.BN32.02.05** - Summarize basic concepts of forensics.

**NCCTE.2020.BN32.02.06** - Explain disaster recovery and continuity of operation concepts.

**NCCTE.2020.BN32.02.07** - Compare various types of controls.

**NCCTE.2020.BN32.02.08** - Carry out data security and privacy practices.

**NCCTE.2020.BN32.03.00** - Understand Cryptography and PKI.

**NCCTE.2020.BN32.03.01** - Compare basic concepts of cryptography.

**NCCTE.2020.BN32.03.02** - Explain cryptography algorithms and their basic characteristics.

**NCCTE.2020.BN32.03.03** - Install and configure wireless security settings.

**NCCTE.2020.BN32.03.04** - Implement public key infrastructure.





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**Course:** Introduction to Computer Science **Updated**

**NCCTE.2020.BP01** - Introduction to Computer Science

**NCCTE.2020.BP01.01.00** - Understand basic coding and computer science using MakeCode.

**NCCTE.2020.BP01.01.01** - Making

**NCCTE.2020.BP01.01.02** - Algorithms

**NCCTE.2020.BP01.01.03** - Variables

**NCCTE.2020.BP01.01.04** - Conditionals

**NCCTE.2020.BP01.01.05** - Iteration

**NCCTE.2020.BP01.01.06** - Coordinate Grid System

**NCCTE.2020.BP01.01.07** - Booleans

**NCCTE.2020.BP01.01.08** - Bits, Bytes, and Binary

**NCCTE.2020.BP01.01.09** - Radio

**NCCTE.2020.BP01.01.10** - Arrays

**Course:** Python Programming I **New**

**NCCTE.2020.BP14** - Python Programming I

**NCCTE.2020.BP14.01.00** - Understand Python language basics.

**NCCTE.2020.BP14.01.01** - Python and Jupyter Basics

**NCCTE.2020.BP14.01.02** - Functions

**NCCTE.2020.BP14.01.03** - Conditionals

**NCCTE.2020.BP14.01.04** - Nesting and Loops

**NCCTE.2020.BP14.02.00** - Understand Python data structures.

**NCCTE.2020.BP14.02.01** - Sequence Indexes

**NCCTE.2020.BP14.02.02** - Sequence Manipulation

**NCCTE.2020.BP14.02.03** - Sequence Iteration

**NCCTE.2020.BP14.02.04** - Working with Files

**NCCTE.2020.BP14.03.00** - Understand how to use Python to develop sustainable code.

**NCCTE.2020.BP14.03.01** - Python Modules

**NCCTE.2020.BP14.03.02** - More-Powerful Statements

**NCCTE.2020.BP14.03.03** - Methods and Structures for Robust Code

**NCCTE.2020.BP14.03.04** - Proper Functions

**Course:** Python Programming II **New**

**NCCTE.2020.BP16** - Python Programming II

**NCCTE.2020.BP16.01.00** - Understand the basic methods of formatting and outputting data.

**NCCTE.2020.BP16.01.01** - Introduce the concept of variables and variable naming conventions.

**NCCTE.2020.BP16.01.02** - Present the assignment operator, along with the rules governing the building of expressions.

**NCCTE.2020.BP16.01.03** - Introduce the inputting and converting of data.

**NCCTE.2020.BP16.02.00** - Understand Boolean values to compare difference values and control the



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execution paths.

**NCCTE.2020.BP16.02.01** - Introduce the utilization of loops (while and for) and how to control their behavior using the break and continue instructions.

**NCCTE.2020.BP16.02.02** - Present the difference between logical and bitwise operations.

**NCCTE.2020.BP16.02.03** - Acquaint the student with the concept of lists and list processing, including the iteration provided by the for loop, and slicing.

**NCCTE.2020.BP16.02.04** - Explain the idea of multi-dimensional arrays.

**NCCTE.2020.BP16.03.00** - Apply the definition and use of functions.

**NCCTE.2020.BP16.03.01** - Present the concept of passing arguments in different ways and setting their default values along with the mechanisms of returning the function's results.

**NCCTE.2020.BP16.03.02** - Explain name scope issues.

**NCCTE.2020.BP16.03.03** - Introduce new data aggregates - tuples and dictionaries - and show their role in data processing.

**NCCTE.2020.BP16.04.00** - Utilize python modules.

**NCCTE.2020.BP16.04.01** - Present the way in which modules are coupled together to make packages.

**NCCTE.2020.BP16.04.02** - Acquaint the student with the concept of an exception and Python's implementation of it, including the try-except instruction, with its applications, and the raise instruction.

**NCCTE.2020.BP16.04.03** - Introduce strings and their specific methods, together with their similarities and differences compared to lists.

**NCCTE.2020.BP16.05.00** - Apply the fundamentals of OOP (Object Oriented Programming).

**NCCTE.2020.BP16.05.01** - Present the standard objective features: inheritance, abstraction, encapsulation, and polymorphism, along with Python-specific issues like instance vs. classvariables, and Python's implementation of inheritance.

**NCCTE.2020.BP16.05.02** - Familiarize the student with Python's generators (the yield instruction) and closures (the lambda keyword).

**NCCTE.2020.BP16.05.03** - Demonstrate the means Python developers can use to process (create, read, and write) files.

**NCCTE.2020.BP16.06.00** - Understand the meaning and impact of Digital Transformation.

**NCCTE.2020.BP16.06.01** - Explain how digital transformation affects business, industry, and our daily lives.

**NCCTE.2020.BP16.06.02** - Configure an IoT device to connect to the network.

**NCCTE.2020.BP16.07.00** - Apply basic programming to support IoT devices.

**NCCTE.2020.BP16.07.01** - Use Python to create programs that accept user input and read and write to external files.

**NCCTE.2020.BP16.07.02** - Explain prototyping and its purpose.

**NCCTE.2020.BP16.08.00** - Understand how data provides value to digital business and society and



## NORTH CAROLINA CAREER AND TECHNICAL EDUCATION STANDARDS

the benefits of automation in the digitized world.

**NCCTE.2020.BP16.08.01** - Explain the concept of Big Data.

**NCCTE.2020.BP16.08.02** - Explain how digitization allows business processes to embrace automation.

**NCCTE.2020.BP16.09.00** - Understand the need for enhanced security in the digitized world and opportunities provided by digital transformation.

**NCCTE.2020.BP16.09.01** - Explain why security is important in the digitized world..

**NCCTE.2020.BP16.09.02** - Explain the challenges and opportunities that exist in the digitized world.

**Course:** SAS Programming I

**NCCTE.BP20** - SAS Programming I

**NCCTE.BP20.01.00** - Apply SAS Base programming concepts.

**NCCTE.BP20.01.01** - Apply basic Base procedures to access libraries and enhance readability.

**NCCTE.BP20.01.02** - Apply editing and debugging techniques to programming procedures.

**NCCTE.BP20.01.03** - Apply DATA STEP programming to create and debug data sets.

**NCCTE.BP20.01.04** - Apply an understanding of the fundamentals of SAS Syntax and rules of SAS programming to successfully run a program.

**NCCTE.BP20.02.00** - Apply techniques to create basic and advanced reports.

**NCCTE.BP20.02.01** - Apply PROC PRINT with options to create basic reports.

**NCCTE.BP20.02.02** - Apply PROC FORMAT, PROC REPORT, PROC MEANS, PROC SORT AND PROC FREQ to generate advanced reports.

**NCCTE.BP20.02.03** - Utilize Output Delivery System.

**NCCTE.BP20.03.00** - Apply advanced programming techniques to manipulate data sets.

**NCCTE.BP20.03.01** - Apply decision structure methods to conditionally assign values when creating and managing variables.

**NCCTE.BP20.03.02** - Apply modifying options to manipulate output.

**NCCTE.BP20.03.03** - Apply advanced programming methods to combine and manipulate data sets.

**NCCTE.BP20.04.00** - Apply advanced programming techniques to manipulate data.

**NCCTE.BP20.04.01** - Apply functions to manipulate and convert data.

**NCCTE.BP20.04.02** - Apply iterative processing and SAS arrays.

**NCCTE.BP20.05.00** - Apply advanced techniques to read data into SAS and manipulate records.

**NCCTE.BP20.05.01** - Apply SAS programming methods to read and handle standard and non-standard numeric data as well as standard and non-standard fixed-field data.

**NCCTE.BP20.05.02** - Apply SAS formats and informats to handle SAS date and time values.

**NCCTE.BP20.05.03** - Apply advanced SAS programming methods to read multiple records sequentially and non-sequentially to create a single record as well as to create multiple observations from a single record.



## NORTH CAROLINA CAREER AND TECHNICAL EDUCATION STANDARDS

**NCCTE.BP20.05.04** - Apply advanced SAS programming procedures to read hierarchical files.

**Course:** Computer Science I **New**

**NCCTE.2020.BP41** - Computer Science I

**NCCTE.2020.BP41.01.00** - Understand the internet.

**NCCTE.2020.BP41.01.01** - Representing and Transmitting Info

**NCCTE.2020.BP41.01.02** - Inventing the Internet

**NCCTE.2020.BP41.02.00** - Understand Digital information.

**NCCTE.2020.BP41.02.01** - Bytes and file sized

**NCCTE.2020.BP41.02.02** - Text Compression

**NCCTE.2020.BP41.02.03** - Encoding B&W Images

**NCCTE.2020.BP41.02.04** - Encoding Color Images

**NCCTE.2020.BP41.02.05** - Lossy Compression and File Forms

**NCCTE.2020.BP41.02.06** - Rapid Research - Format Showdown

**NCCTE.2020.BP41.03.00** - Understand Intro to Programming and Algorithms.

**NCCTE.2020.BP41.03.01** - The Need for Programming Languages

**NCCTE.2020.BP41.03.02** - The Need for Algorithms

**NCCTE.2020.BP41.03.03** - Creativity in Algorithms

**NCCTE.2020.BP41.03.04** - Using Simple Commands

**NCCTE.2020.BP41.03.05** - Creating Functions

**NCCTE.2020.BP41.03.06** - Functions and top-Down Design

**NCCTE.2020.BP41.03.07** - APIs and Function Parameters

**NCCTE.2020.BP41.03.08** - Creating Functions with Parameters

**NCCTE.2020.BP41.03.09** - Looping and Random Numbers

**NCCTE.2020.BP41.03.10** - Practice PT - Design a Digital Scene

**NCCTE.2020.BP41.04.00** - Understand Big Data and Privacy.

**NCCTE.2020.BP41.04.01** - What is Big Data

**NCCTE.2020.BP41.04.02** - Finding Trends with Visualizations

**NCCTE.2020.BP41.04.03** - Check Your Assumptions

**NCCTE.2020.BP41.04.04** - Rapid Research - Data Innovations

**NCCTE.2020.BP41.04.05** - Identifying People with Data

**NCCTE.2020.BP41.05.00** - Understand Building Apps.

**NCCTE.2020.BP41.05.01** - Event-Driven Programming

**NCCTE.2020.BP41.05.02** - Programming with Data Structures

**NCCTE.2020.BP41.06.00** - Understand Data Tools.

**NCCTE.2020.BP41.06.01** - Intro to Data

**NCCTE.2020.BP41.06.02** - Good and Bad Data Visualizations

**NCCTE.2020.BP41.06.03** - Making Data Visualizations

**NCCTE.2020.BP41.06.04** - Discover a Data Story



## NORTH CAROLINA CAREER AND TECHNICAL EDUCATION STANDARDS

**NCCTE.2020.BP41.06.05** - Cleaning Data

**NCCTE.2020.BP41.06.06** - Creating Summary Tables

**Course:** Computer Science II **New**

**NCCTE.2020.BP42** - Computer Science II

**NCCTE.2020.BP42.01.00** - Understand Introduction to Programming.

**NCCTE.2020.BP42.01.01** - Getting Started with Snap!

**NCCTE.2020.BP42.01.02** - Gossip and Greet

**NCCTE.2020.BP42.01.03** - Modert Art with Polygons

**NCCTE.2020.BP42.01.04** - Protecting Your Privacy

**NCCTE.2020.BP42.01.05** - Follow the Leader

**NCCTE.2020.BP42.01.06** - Projects (Supplemental)

**NCCTE.2020.BP42.02.00** - Understand Abstraction.

**NCCTE.2020.BP42.02.01** - Improving Games by Using Variables

**NCCTE.2020.BP42.02.02** - Making Art by Using Data Structures

**NCCTE.2020.BP42.02.03** - Making Decisions by Using Predicates

**NCCTE.2020.BP42.02.04** - Dealing with Complexity

**NCCTE.2020.BP42.02.05** - Copyrights

**NCCTE.2020.BP42.02.06** - Projects (Supplemental)

**NCCTE.2020.BP42.03.00** - Understand Data Processing and Lists.

**NCCTE.2020.BP42.03.01** - Contact Lists

**NCCTE.2020.BP42.03.02** - Tic-Tac-Toe

**NCCTE.2020.BP42.03.03** - Robots and Artificial Intelligence

**NCCTE.2020.BP42.03.04** - Building Data Visualization Tools

**NCCTE.2020.BP42.03.05** - Big Data

**NCCTE.2020.BP42.03.06** - Projects (Supplemental)

**NCCTE.2020.BP42.04.00** - Understand How the Internet Works.

**NCCTE.2020.BP42.04.01** - Reliable Communication

**NCCTE.2020.BP42.04.02** - Communication Protocols

**NCCTE.2020.BP42.04.03** - Cybersecurity

**NCCTE.2020.BP42.04.04** - Community and Online Interactions

**NCCTE.2020.BP42.04.05** - Computers and Work

**NCCTE.2020.BP42.04.06** - Explore PT Prep

**NCCTE.2020.BP42.05.00** - Undertstand Algorithms and Simulations

**NCCTE.2020.BP42.05.01** - Search Algorithms

**NCCTE.2020.BP42.05.02** - Models and Simulations

**NCCTE.2020.BP42.05.03** - Timing Experiments

**NCCTE.2020.BP42.05.04** - Unsolvable and undecidable Proglems

**NCCTE.2020.BP42.05.05** - Computing in War



## NORTH CAROLINA CAREER AND TECHNICAL EDUCATION STANDARDS

**NCCTE.2020.BP42.05.06** - Projects (Supplemental)

**NCCTE.2020.BP42.05.07** - Create PT Prep

**Course:** Network Engineering Technology I **Updated**

**NCCTE.2020.II11** - Cisco Network Engineering Technology I

**NCCTE.2020.II11.01.00** - Explain the advances in modern network technologies.

**NCCTE.2020.II11.02.00** - Apply procedures to implement initial settings including passwords, IP addressing, and default gateway parameters on a network switch and end devices.

**NCCTE.2020.II11.03.00** - Explain how network protocols enable devices to access local and remote network resources.

**NCCTE.2020.II11.04.00** - Explain how physical layer protocols, services, and network media support communications across data networks.

**NCCTE.2020.II11.05.00** - Understand how to calculate numbers between decimal, binary, and hexadecimal systems.

**NCCTE.2020.II11.06.00** - Explain how media access control in the data link layer supports communication across networks.

**NCCTE.2020.II11.07.00** - Explain how Ethernet operates in a switched network.

**NCCTE.2020.II11.08.00** - Explain how routers use network layer protocols and services to enable end-to-end connectivity.

**NCCTE.2020.II11.09.00** - Explain how ARP and ND enable communication on a network.

**NCCTE.2020.II11.10.00** - Apply procedures to implement initial settings on a router and end devices.

**NCCTE.2020.II11.11.00** - Understand how to calculate an IPv4 subnetting scheme to efficiently segment a network.

**NCCTE.2020.II11.12.00** - Apply procedures to implement an IPv6 addressing scheme.

**NCCTE.2020.II11.13.00** - Understand the various tools used to test network connectivity.

**NCCTE.2020.II11.14.00** - Understand how to compare the operations of transport layer protocols in supporting end to end communication.

**NCCTE.2020.II11.15.00** - Explain the operation of application layer protocols in providing support to end-user applications.

**NCCTE.2020.II11.16.00** - Understand how to configure switches and routers with device hardening features to enhance security.

**NCCTE.2020.II11.17.00** - Apply procedures to implement a network design for a small network to include a router, a switch, and end devices.

**Course:** Network Engineering Technology II **Updated**

**NCCTE.2020.II12** - Cisco Network Engineering Tech II

**NCCTE.2020.II12.01.00** - Apply procedures to configure devices by using security best practices.

**NCCTE.2020.II12.02.00** - Understand how Layer 2 switches forward data.

**NCCTE.2020.II12.03.00** - Apply procedures to implement VLANs and trunking in a switched network.





## NORTH CAROLINA CAREER AND TECHNICAL EDUCATION STANDARDS

- NCCTE.2020.II12.04.00** - Apply procedures to troubleshoot inter-VLAN routing on Layer 3 devices.
- NCCTE.2020.II12.05.00** - Understand how STP enables redundancy in a Layer 2 network.
- NCCTE.2020.II12.06.00** - Apply procedures to troubleshoot EtherChannel on switched links.
- NCCTE.2020.II12.07.00** - Apply procedures to implement DHCPv4 to operate across multiple LANs.
- NCCTE.2020.II12.08.00** - Apply procedures to configure dynamic address allocation in IPv6 networks.
- NCCTE.2020.II12.09.00** - Understand how FHRPs provide default gateway services in a redundant network.
- NCCTE.2020.II12.10.00** - Understand how vulnerabilities compromise LAN security.
- NCCTE.2020.II12.11.00** - Apply procedures to implement switch security to mitigate LAN attacks.
- NCCTE.2020.II12.12.00** - Understand how WLANs enable network connectivity.
- NCCTE.2020.II12.13.00** - Apply procedures to implement a WLAN using a wireless router and WLC.
- NCCTE.2020.II12.14.00** - Understand how routers use information in packets to make forwarding decisions.
- NCCTE.2020.II12.15.00** - Apply procedures to configure IPv4 and IPv6 static routes.
- NCCTE.2020.II12.16.00** - Apply procedures to troubleshoot static and default route configurations.
- NCCTE.2020.II12.17.00** - Identify Cisco equipment and related hardware.
- NCCTE.2020.II12.18.00** - Understand Cisco IOS software operation.
- NCCTE.2020.II12.19.00** - Understand general networking knowledge.
- NCCTE.2020.II12.20.00** - Understand service-related knowledge

**Course:** Computer Engineering Technology I Updated

**NCCTE.2020.II21** - Computer Engineering Technology I

- NCCTE.2020.II21.01.00** - Understand mobile devices.
  - NCCTE.2020.II21.01.01** - Install and configure laptop hardware and components.
  - NCCTE.2020.II21.01.02** - Install components within the display of a laptop.
  - NCCTE.2020.II21.01.03** - Use appropriate laptop features.
  - NCCTE.2020.II21.01.04** - Compare characteristics of various types of other mobile devices.
  - NCCTE.2020.II21.01.05** - Connect and configure accessories and ports of other mobile devices.
  - NCCTE.2020.II21.01.06** - Configure basic mobile device network connectivity and application support.
  - NCCTE.2020.II21.01.07** - Use methods to perform mobile device synchronization.
- NCCTE.2020.II21.02.00** - Understand networking.
  - NCCTE.2020.II21.02.01** - Compare TCP and UDP ports, protocols, and their purposes.
  - NCCTE.2020.II21.02.02** - Compare common networking hardware devices.
  - NCCTE.2020.II21.02.03** - Install and configure a basic wired/wireless SOHO network.
  - NCCTE.2020.II21.02.04** - Compare wireless networking protocols.
  - NCCTE.2020.II21.02.05** - Summarize the properties and purposes of services provided by networked hosts.
  - NCCTE.2020.II21.02.06** - Explain common network configuration concepts.



## NORTH CAROLINA CAREER AND TECHNICAL EDUCATION STANDARDS

**NCCTE.2020.II21.02.07** - Compare Internet connection types, network types, and their features.Â

**NCCTE.2020.II21.02.08** - Use appropriate networking tools.

**NCCTE.2020.II21.03.00** - Understand hardware.

**NCCTE.2020.II21.03.01** - Explain basic cable types, features, and their purposes.

**NCCTE.2020.II21.03.02** - Identify common connectory types.

**NCCTE.2020.II21.03.03** - Install RAM types.

**NCCTE.2020.II21.03.04** - Select, install and configure storage devices.

**NCCTE.2020.II21.03.05** - Install and configure motherboards, CPUs, and add-on cards.

**NCCTE.2020.II21.03.06** - Explain the purposes and uses of various peripheral types.

**NCCTE.2020.II21.03.07** - Summarize power supply types and features.

**NCCTE.2020.II21.03.08** - Select and configure appropriate components for a custom PC configuration to meet customer specifications or needs.

**NCCTE.2020.II21.03.09** - Install and configure common devices.Â

**NCCTE.2020.II21.03.10** - Configure SOHO multifunction devices, printers and settings.

**NCCTE.2020.II21.03.11** - Install and maintain various print technologies.

**NCCTE.2020.II21.04.00** - Understand virtualization and cloud computing.

**NCCTE.2020.II21.04.01** - Compare cloud computing concepts.

**NCCTE.2020.II21.04.02** - Set up and configure client-side virtualization.

**NCCTE.2020.II21.05.00** - Understand hardware and network troubleshooting.

**NCCTE.2020.II21.05.01** - Use the best practice methodology to resolve problems.Â

**NCCTE.2020.II21.05.02** - Troubleshoot problems related to motherboards, RAM, CPUs, and power.

**NCCTE.2020.II21.05.03** - Troubleshoot hard drives and RAID arrays.

**NCCTE.2020.II21.05.04** - Troubleshoot video, projector, and display issues.

**NCCTE.2020.II21.05.05** - Troubleshoot common mobile device issues while adhering to the appropriate procedures.

**NCCTE.2020.II21.05.06** - Troubleshoot printers.

**NCCTE.2020.II21.05.07** - Troubleshoot common wired and wireless network problems.

**Course:** Computer Engineering Technology II **Updated**

**NCCTE.2020.II22** - Computer Engineering Technology II

**NCCTE.2020.II22.01.00** - Understand operating systems

**NCCTE.2020.II22.01.01** - Compare common operating system types and their purposes.

**NCCTE.2020.II22.01.02** - Compare features of Microsoft Windows versions.

**NCCTE.2020.II22.01.03** - Summarize general OS installation considerations and upgrade methods.

**NCCTE.2020.II22.01.04** - Use appropriate Microsoft command line tools.

**NCCTE.2020.II22.01.05** - Use Micorsoft operating system features and tools.

**NCCTE.2020.II22.01.06** - Use Microsoft Windows control panel utilities.

**NCCTE.2020.II22.01.07** - Summarize application installation and configuration concepts.

**NCCTE.2020.II22.01.08** - Configure Microsoft Windows networking on a client or desktop.



## NORTH CAROLINA CAREER AND TECHNICAL EDUCATION STANDARDS

**NCCTE.2020.II22.01.09** - Use features and tools of the Mac OS and Linux client or desktop operating systems.

**NCCTE.2020.II22.02.00** - Understand security.

**NCCTE.2020.II22.02.01** - Summarize the importance of physical security measures.

**NCCTE.2020.II22.02.02** - Explain logical security concepts.

**NCCTE.2020.II22.02.03** - Compare wireless security protocols and authentication methods.

**NCCTE.2020.II22.02.04** - Detect, remove, and prevent malware using appropriate tools and methods.

**NCCTE.2020.II22.02.05** - Compare social engineering, threats, and vulnerabilities.

**NCCTE.2020.II22.02.06** - Compare Microsoft Windows OS security settings.

**NCCTE.2020.II22.02.07** - Implement security best practices to secure a workstation.

**NCCTE.2020.II22.02.08** - Implement methods for securing mobile devices.

**NCCTE.2020.II22.02.09** - Implement appropriate data destruction and disposal methods.

**NCCTE.2020.II22.02.10** - Configure security on SOHO wireless and wired networks.

**NCCTE.2020.II22.03.00** - Understand software troubleshooting.

**NCCTE.2020.II22.03.01** - Troubleshoot Microsoft Windows OS problems.

**NCCTE.2020.II22.03.02** - Troubleshoot and resolve PC security issues.

**NCCTE.2020.II22.03.03** - Use best practice procedures for malware removal.

**NCCTE.2020.II22.03.04** - Troubleshoot mobile OS and application issues.

**NCCTE.2020.II22.03.05** - Troubleshoot mobile OS and application security issues.

**NCCTE.2020.II22.04.00** - Understand operational procedures.

**NCCTE.2020.II22.04.01** - Compare best practices associated with types of documentation.

**NCCTE.2020.II22.04.02** - Implement basic change management best practices.

**NCCTE.2020.II22.04.03** - Implement basic disaster prevention and recovery methods.

**NCCTE.2020.II22.04.04** - Explain common safety procedures.

**NCCTE.2020.II22.04.05** - Explain environmental impacts and appropriate controls.

**NCCTE.2020.II22.04.06** - Explain the processes for addressing prohibited content activity, privacy licensing, and policy concepts.

**NCCTE.2020.II22.04.07** - Use proper communication techniques and professionalism.

**NCCTE.2020.II22.04.08** - Identify the basics of scripting.

**NCCTE.2020.II22.04.09** - Use remote access technologies.

**Course:** Adobe Visual Design

**NCCTE.2016.II31** - Adobe Visual Design

**NCCTE.2016.II31.01.00** - Apply procedures to use Adobe Photoshop for visual communications.

**NCCTE.2016.II31.01.01** - Understand project requirements using photographs.

**NCCTE.2016.II31.01.02** - Understand Digital Images.

**NCCTE.2016.II31.01.03** - Understand Adobe Photoshop CC interface.

**NCCTE.2016.II31.01.04** - Apply procedures to create images using Adobe Photoshop CC.



## NORTH CAROLINA CAREER AND TECHNICAL EDUCATION STANDARDS

**NCCTE.2016.II31.01.05** - Apply procedures to publish digital images using Adobe Photoshop CC.

**NCCTE.2016.II31.02.00** - Apply procedures to use Adobe Illustrator for visual communications.

**NCCTE.2016.II31.02.01** - Understand project requirements for vector graphics.

**NCCTE.2016.II31.02.02** - Understand digital graphics and illustrations.

**NCCTE.2016.II31.02.03** - Understand Adobe Illustrator CC interface.

**NCCTE.2016.II31.02.04** - Apply procedures to create digital graphics and illustrations using Adobe Illustrator CC.

**NCCTE.2016.II31.02.05** - Apply procedures to archive, export, and publish graphics using Adobe Illustrator CC.

**NCCTE.2016.II31.03.00** - Apply procedures to use Adobe InDesign for visual communications.

**NCCTE.2016.II31.03.01** - Understand project requirements for graphic layouts.

**NCCTE.2016.II31.03.02** - Understand print and digital media publications using Adobe InDesign CC.

**NCCTE.2016.II31.03.03** - Understand Adobe InDesign CC interface.

**NCCTE.2016.II31.03.04** - Apply procedures to create print and digital media publications using Adobe InDesign CC.

**NCCTE.2016.II31.03.05** - Apply procedures to publish, export, and archive page layouts using Adobe InDesign CC.

**Course:** Adobe Digital Design

**NCCTE.2016.II32** - Adobe Digital Design

**NCCTE.2016.II32.01.00** - Understand project requirements for web development.

**NCCTE.2016.II32.02.00** - Understand Web authoring.

**NCCTE.2016.II32.03.00** - Understand the Adobe Dreamweaver CC interface.

**NCCTE.2016.II32.04.00** - Apply procedures for Web authoring using Adobe Dreamweaver CC.

**NCCTE.2016.II32.05.00** - Apply procedures to test, publish, and maintain Web content using Adobe Dreamweaver CC.

**Course:** Adobe Video Design Updated

**NCCTE.2020.II33** - Adobe Video Design

**NCCTE.2020.II33.01.00** - Understand project requirements for video projects

**NCCTE.2020.II33.01.01** - Identify the purpose, audience, and audience needs for preparing video.

**NCCTE.2020.II33.01.02** - Summarize how digital video professionals make decisions about the type of content to include in a project, including considerations such as copyright, audience needs, permissions, and licensing.

**NCCTE.2020.II33.01.03** - Demonstrate knowledge of project management tasks and responsibilities.

**NCCTE.2020.II33.01.04** - Communicate with others (such as peers and clients) about editing plans.



## NORTH CAROLINA CAREER AND TECHNICAL EDUCATION STANDARDS

**NCCTE.2020.II33.02.00** - Understand digital video

**NCCTE.2020.II33.02.01** - Understand key terminology related to digital video

**NCCTE.2020.II33.02.02** - Demonstrate knowledge of basic principles and best practices employed in the digital video industry

**NCCTE.2020.II33.02.03** - Demonstrate knowledge of how to use transitions and effects to enhance video content

**NCCTE.2020.II33.02.04** - Demonstrate knowledge of using audio to enhance video content

**NCCTE.2020.II33.02.05** - Demonstrate knowledge of using still images to enhance video content.

**NCCTE.2020.II33.03.00** - Understanding the Adobe Premiere Pro interface

**NCCTE.2020.II33.03.01** - Identify elements of the Premiere Pro user interface, and demonstrate knowledge of their functions.

**NCCTE.2020.II33.03.02** - Define the functions of commonly used tools, including the Selection, Track Selection, Ripple Edit, Rolling Edit, Rate Stretch, Pen, Razor, Slide, Slip, Hand, and Zoom tools.

**NCCTE.2020.II33.03.03** - Navigate, organize, and customize the workspace.

**NCCTE.2020.II33.04.00** - Apply procedures to edit a video sequence with Adobe Premiere

**NCCTE.2020.II33.04.01** - Create a new project

**NCCTE.2020.II33.04.02** - Import media assets (video, image, and audio files).

**NCCTE.2020.II33.04.03** - Demonstrate knowledge of how to set up and navigate a video sequence in Premiere Pro.

**NCCTE.2020.II33.04.04** - Organize and manage video clips in a sequence

**NCCTE.2020.II33.04.05** - Trim clips

**NCCTE.2020.II33.04.06** - Manage sound in a video sequence

**NCCTE.2020.II33.04.07** - Manage superimposed text and shapes in a video sequence.

**NCCTE.2020.II33.04.08** - Add and manage effects and transitions in a video sequence

**NCCTE.2020.II33.05.00** - Apply procedures to export a video with Adobe Premiere

**NCCTE.2020.II33.05.01** - Demonstrate knowledge of export options for video

**NCCTE.2020.II33.05.02** - Demonstrate knowledge of how to export video from Adobe Premiere

**Course:** Digital Design and Animation I Updated

**NCCTE.2020.TS24** - Digital Design and Animation I

**NCCTE.2020.TS24.01.00** - Understand digital design production.

**NCCTE.2020.TS24.01.01** - Remember the history and careers of digital design and modeling.

**NCCTE.2020.TS24.01.02** - Remember hardware and software used in digital design.

**NCCTE.2020.TS24.01.03** - Understand intellectual property guidelines in digital design.

**NCCTE.2020.TS24.02.00** - Apply procedures to produce 2D graphics.

**NCCTE.2020.TS24.02.01** - Apply vector image production methods.

**NCCTE.2020.TS24.02.02** - Apply bitmap editing and production methods.

**NCCTE.2020.TS24.03.00** - Understand digital design techniques.

**NCCTE.2020.TS24.03.01** - Understand design pipeline.



## NORTH CAROLINA CAREER AND TECHNICAL EDUCATION STANDARDS

**NCCTE.2020.TS24.03.02** - Understand elements and principles of digital design.

**NCCTE.2020.TS24.03.03** - Understand color theory in digital design.

**NCCTE.2020.TS24.03.04** - Understand composition techniques.

**NCCTE.2020.TS24.04.00** - Apply procedures to produce digital audio and video.

**NCCTE.2020.TS24.04.01** - Apply procedures to edit and produce digital audio and video.

**NCCTE.2020.TS24.04.02** - Apply digital effects to audio and video.

**NCCTE.2020.TS24.04.03** - Apply procedures to animate graphics.

**NCCTE.2020.TS24.05.00** - Apply procedures to produce 3D graphics.

**NCCTE.2020.TS24.05.01** - Understand transformations in Cartesian space.

**NCCTE.2020.TS24.05.02** - Apply procedures to render 3D models, scenes and animations.

**Course:** Digital Design and Animation II **New**

**NCCTE.2020.TS25** - Digital Design and Animation II

**NCCTE.2020.TS25.01.00** - Understand portfolio development and professionalism.

**NCCTE.2020.TS25.01.01** - Understand how to document the design process and articulate an artistic point of view..

**NCCTE.2020.TS25.01.02** - Understand personal and professional presentation.

**NCCTE.2020.TS25.02.00** - Understand modeling concepts.

**NCCTE.2020.TS25.02.01** - Apply vector image production methods.

**NCCTE.2020.TS25.02.02** - Apply bitmap editing and production methods.

**NCCTE.2020.TS25.02.03** - Understand parametric modeling concepts.

**NCCTE.2020.TS25.02.04** - Understand 3D simulations, particle systems and forces.

**NCCTE.2020.TS25.03.00** - Understand materials, shaders and rendering.

**NCCTE.2020.TS25.03.01** - Remember the basic functions of the material editor.

**NCCTE.2020.TS25.03.02** - Understand and differentiate between materials, maps, textures, and shaders.

**NCCTE.2020.TS25.03.03** - Understand UVW mapping.

**NCCTE.2020.TS25.03.04** - Understand rendering and render settings.

**NCCTE.2020.TS25.04.00** - Apply 3D lights and their application.

**NCCTE.2020.TS25.04.01** - Understand types of lights.

**NCCTE.2020.TS25.04.02** - Understand light settings.

**NCCTE.2020.TS25.04.03** - Understand shadow settings.

**NCCTE.2020.TS25.04.04** - Apply artistic lighting techniques.

**NCCTE.2020.TS25.05.00** - Apply basic cameras and settings.

**NCCTE.2020.TS25.05.01** - Understand physical cameras and their settings and usage.

**NCCTE.2020.TS25.05.02** - Understand various camera movements and composition.

**NCCTE.2020.TS25.05.03** - Apply animated camera movements to a scene.

**NCCTE.2020.TS25.06.00** - Apply basic rigging and animation techniques.

**NCCTE.2020.TS25.06.01** - Understand keyframing and interpolation.





## NORTH CAROLINA CAREER AND TECHNICAL EDUCATION STANDARDS

**NCCTE.2020.TS25.06.02** - Understand playback and timeline settings.

**NCCTE.2020.TS25.06.03** - Understand animation constraints and helpers.

**NCCTE.2020.TS25.06.04** - Understand object linking and hierarchy.

**NCCTE.2020.TS25.06.05** - Understand how to create and modify bipeds.

**NCCTE.2020.TS25.06.06** - Apply advanced animation and modeling techniques to produce an 30 second animated short.

**Course:** Game Art and Design **Updated**

**NCCTE.2020.TS31** - Game Art and Design

**NCCTE.2020.TS31.01.00** - Understand history careers and ethics in gaming.

**NCCTE.2020.TS31.01.01** - Understand skills and careers to work in the gaming industry.

**NCCTE.2020.TS31.01.02** - Recall the history of games and the game industry

**NCCTE.2020.TS31.01.03** - Understand rating systems and ethics in the gaming industry

**NCCTE.2020.TS31.02.00** - Understand the elements of game theory

**NCCTE.2020.TS31.02.01** - Understand player experience

**NCCTE.2020.TS31.02.02** - Classify game elements

**NCCTE.2020.TS31.02.03** - Categorize games by interaction, objectives and genres

**NCCTE.2020.TS31.03.00** - Apply pre-production techniques to plan game prototypes

**NCCTE.2020.TS31.03.01** - Summarize the development process of game design

**NCCTE.2020.TS31.03.02** - Apply game conceptualization methods including brainstorming, sketching, and storyboarding.

**NCCTE.2020.TS31.03.03** - Execute a game design document

**NCCTE.2020.TS31.03.04** - Apply procedures to produce an original game prototype

**NCCTE.2020.TS31.03.05** - Outline level layouts to plan and populate games

**NCCTE.2020.TS31.03.06** - Evaluate the prototype using game design parameters

**NCCTE.2020.TS31.04.00** - Apply procedures to develop a game

**NCCTE.2020.TS31.04.01** - Recognize a basic game engine interface and correct terminology sketching, and storyboarding.

**NCCTE.2020.TS31.04.02** - Demonstrate creation of game assets and game engine elements

**NCCTE.2020.TS31.04.03** - Produce original game environments and levels

**NCCTE.2020.TS31.04.04** - Produce an original game using existing game theory and design

**NCCTE.2020.TS31.05.00** - Apply post-production techniques to evaluate video games

**NCCTE.2020.TS31.05.01** - Organize and produce a game design portfolio

**NCCTE.2020.TS31.05.02** - Evaluate original games using game theory and quality assurance principles

**Course:** Advanced Game Art and Design **Updated**

**NCCTE.2020.TS32** - Advanced Game Art and Design

**NCCTE.2020.TS32.01.00** - Understand career practices related to the game Industry



## NORTH CAROLINA CAREER AND TECHNICAL EDUCATION STANDARDS

**NCCTE.2020.TS32.01.01** - Recognize careers related to the game industry

**NCCTE.2020.TS32.01.02** - Understand legal issues in game design

**NCCTE.2020.TS32.01.03** - Summarize global game market dynamics and regulations

**NCCTE.2020.TS32.01.04** - Understand Serious Games

**NCCTE.2020.TS32.02.00** - Implement production management in game design

**NCCTE.2020.TS32.02.01** - Preproduction: Understand Game User Interfaces

**NCCTE.2020.TS32.02.02** - Preproduction: Categorize Choices and Convexit

**NCCTE.2020.TS32.02.03** - Production: Analyze game Production

**NCCTE.2020.TS32.03.00** - Execute audio and video techniques

**NCCTE.2020.TS32.03.01** - Summarize advanced interactive storytelling and character development

**NCCTE.2020.TS32.03.02** - Excecute video editing techniques

**NCCTE.2020.TS32.03.03** - Understand sound theory in game design

**NCCTE.2020.TS32.03.04** - Execute appropriate audio to an existing scene

**NCCTE.2020.TS32.04.00** - Execute advanced visual design

**NCCTE.2020.TS32.04.01** - Execute advanced 3D modeling techniques

**NCCTE.2020.TS32.04.02** - Execute advanced 3D characters and environments

**NCCTE.2020.TS32.04.03** - Understand 3D texturing

**NCCTE.2020.TS32.05.00** - Create scenses using a 3D game engine

**NCCTE.2020.TS32.05.01** - Classify existing 3D game engines

**NCCTE.2020.TS32.05.02** - Analyze the basic mechanics of a selected 3D game engine

**NCCTE.2020.TS32.05.03** - Create sample levels and actions

**NCCTE.2020.TS32.05.04** - Create an original 3D game using existing game theory and design

**NCCTE.2020.TS32.05.05** - Critique 3D games

**NCCTE.2020.TS32.06.00** - Explain the steps of game marketing

**NCCTE.2020.TS32.06.01** - Summarize the basics of game marketing

**NCCTE.2020.TS32.06.02** - Create a game portfolio

