

Nevada Cybersecurity 1

High School - One Year (125 hours)

Course Overview and Goals

This course covers the fundamentals of computer hardware and software, as well as topics in design, maintenance, and repair. Students will be able to describe the internal components of a computer, assemble a computer system, install an operating system, and troubleshoot using system tools and diagnostic software.

Learning Environment

The course utilizes a blended classroom approach. The content is a mix of web-based and physical activities. Students will investigate and discuss cyber-related topics, conduct hands-on labs, and engage in in-person collaborative exercises with classmates. Teachers utilize tools and resources provided by CodeHS to leverage time in the classroom and give focused 1-on-1 attention to students.

Programming Environment

Students modify and run programs in the browser using the CodeHS online editor. Students will be able to modify text-based programs in HTML, JavaScript, and simulate shell commands. Students will also participate in hands-on labs that include networking and computing topics. Students will be able to document their processes and discuss best practices for preventing cyber attacks.

Prerequisites

The Nevada Cybersecurity 1 course is designed for beginners to intermediate computer science students with at least some knowledge and interest in computer science. The course is highly visual, dynamic, and interactive, making it engaging for those new to computer science.

More Information

Browse the content of this course at <https://codehs.com/course/15163>

Course Breakdown

Module 1: Computer Safety (2 weeks/10 hours)

This module provides an introduction to cybersecurity. It focuses on why cybersecurity is important, recent threats to cybersecurity, and different careers in the field. Students will also learn and discuss the principles of environmental and personal safety as it relates to computer use.

Objectives / Topics Covered	<ul style="list-style-type: none">● Course Overview● What is Cybersecurity?● Impact of Cybersecurity● Environmental Controls● Personal Safety
Example Assignments	<ul style="list-style-type: none">● Course Overview

/ Labs	<ul style="list-style-type: none"> ○ Do you use the Internet? ○ How do you use the Internet? ○ What kinds of information are at risk? ○ What are some different CS career fields? ○ Coding as the new literacy ○ What is this course about? ○ Example activity: <ul style="list-style-type: none"> ■ Lists steps to take to protect yourself on the Internet ■ What is something you want to know or make by the end of the course? ● What is Cybersecurity? <ul style="list-style-type: none"> ○ Cybersecurity defined ○ Why is cybersecurity important? ○ Cybersecurity in the news ○ Cybersecurity and IoT (Internet of Things) ○ How do we prevent cyber attacks? ○ Example activities: <ul style="list-style-type: none"> ■ Summarize and discuss recent cyber attacks ■ Explore a threat map to see where cyber attacks are coming from and which countries are being targeted ● Impact of Cybersecurity <ul style="list-style-type: none"> ○ Why do we care about cybersecurity? ○ What information is at risk? ○ What are the impacts of cyber-attacks? <ul style="list-style-type: none"> ■ Financial impact ○ Cybersecurity workforce ○ What are current cybersecurity careers? ○ Example activities: <ul style="list-style-type: none"> ■ Review resources and reflect on or discuss <ul style="list-style-type: none"> ● What information do cybercriminals steal? ● What do cybercriminals do with stolen information? ● Environmental Controls <ul style="list-style-type: none"> ○ What environmental controls are used in computer systems? ○ What is the potential danger of an environment in which the humidity is too low or too high? ○ What security measures are designed to assist with electrical issues? ○ Example activity: <ul style="list-style-type: none"> ■ What are the physical security measures that are implemented at your school? What do you think could be added? ■ You are tasked with designing the security system for a top-secret government building. Be sure to use a range of different security measures.
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Module 2: Project - Put it in Writing! (3 weeks/15 hours)

In this project, students will develop a training policy that informs employees on matters of network security and details the company policy on preventative measures employees should take.

Objectives / Topics Covered	<ul style="list-style-type: none"> ● Privacy and Security ● Creative Credit and Copyright
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	<ul style="list-style-type: none"> ● User Training ● Incident Response Plans ● Data Policy and Privacy ● Change Management
Example Assignments / Labs	<ul style="list-style-type: none"> ● Privacy and Security <ul style="list-style-type: none"> ○ What are data privacy and security? ○ How can you keep personal data secure and private? ○ What can happen if your data is stolen and what can you do about it? ○ Example activities: <ul style="list-style-type: none"> ■ Test out various passwords on a site ■ Explore Google's privacy policy: What do they know about you? ● Creative Credit and Copyright <ul style="list-style-type: none"> ○ What is copyright? ○ What are the different types of copyright licenses ○ Example activities: <ul style="list-style-type: none"> ■ Create citations for sources ● Explore image search tools ● Develop a training policy that informs employees on matters of network security. ● Create an Incidence Response Plan. ● Develop a strong data policy for a company. ● Develop a change management plan to ensure that the new policy is adopted and implemented by the team effectively.

Module 3: Operating Systems (5 weeks/25 hours)

Students will compare and contrast common operating systems (Windows, Linux, OS) and explain the importance of application security. They will investigate security options and implement user accounts to enforce authentication and authorization. Students will also demonstrate how to work with basic and advanced command prompts.

Objectives / Topics Covered	<ul style="list-style-type: none"> ● Operating Systems ● Software and Applications ● Application Security ● Browser Configuration ● System Administration ● Command Line Interface
Example Assignments / Labs	<ul style="list-style-type: none"> ● Understanding Operating Systems ● Comparing Operating Systems <ul style="list-style-type: none"> ○ Installing an OS ● File Management <ul style="list-style-type: none"> ○ What Processor are you Running? ○ Lab: Configuring a Computer ● Software Licenses ● Antivirus Software <ul style="list-style-type: none"> ○ Data Backups ● Using Cache ● Popup Blockers ● User Accounts

	<ul style="list-style-type: none"> ○ Admin vs. Standard ● Host Security <ul style="list-style-type: none"> ○ Using a Log ● System Commands <ul style="list-style-type: none"> ○ cd, ls, mk etc ● Network Commands <ul style="list-style-type: none"> ○ ipconfig, netstat etc
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Module 4: Hardware (5 weeks/25 hours)

Students will learn about the physical elements of computers, laptops and mobile devices such as motherboards, RAM, routers, and the use of port numbers, ethernet and wireless devices.

Objectives / Topics Covered	<ul style="list-style-type: none"> ● Internal Components of a Computer ● Peripheral Devices ● Network Devices ● Storage and Network Options ● Advanced Devices ● Network Communication ● Network Management ● Laptops and Tablets ● Mobile Devices
Example Assignments / Labs	<ul style="list-style-type: none"> ● Different Types of CPU ● RAM vs. Hard Drive ● Lab: Computer Disassembly ● Wireless Internet Connections <ul style="list-style-type: none"> ○ Speed Test ● Lab: Design a Distribution Frame ● Security of Cloud Storage ● Ethernet Standards ● Lab: SOHO Devices ● Setting Up a Firewall <ul style="list-style-type: none"> ○ Establish Firewall Rules ● Lab: Windows Networking ● SSH Logs <ul style="list-style-type: none"> ○ Reading Logs ● Lab: Mobile Device Connectivity

Module 5: Project - Troubleshooting (2 weeks/10 hours)

Students will explore the troubleshooting methodology and utilize it to solve sample IT support issues.

Objectives / Topics Covered	<ul style="list-style-type: none"> ● Troubleshooting Methodology <ul style="list-style-type: none"> ○ Identify the problem ○ Research past solutions ○ Establish a theory ○ Test the theory ○ Establish a plan of action ○ Implement the solution ○ Verify functionality
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	<ul style="list-style-type: none"> ○ Document findings
Example Assignments / Labs	<ul style="list-style-type: none"> ● Troubleshooting: In this project, students will learn more about each step of the troubleshooting methodology and use these steps to repair and improve faulty network systems. <ul style="list-style-type: none"> ○ Poor Signal Strength ○ Interference

Module 6: Project - IT Professional (3 weeks/15 hours)

In this project, students will explore cybersecurity career pathways and build skills that will be needed within these fields such as communication.

Objectives / Topics Covered	<ul style="list-style-type: none"> ● Cybersecurity Career Pathways ● Customer Service and Communication ● Contributing to a Knowledge Base ● Creating an Instructional Video ● Creating a Service Agreement
Example Assignments / Labs	<ul style="list-style-type: none"> ● Act it out! Pair up with a partner and create a short script of a customer support scenario based on a common mobile device issue. ● Write a KB Article: Create an internal knowledge base article that will be shared with other technicians. ● Star in a Video! Create a 2-5 minute video tutorial based on a common mobile device issue

Module 7: Networking (5 weeks/25 hours)

This module explores the structure and design of the internet and networks, and how this design affects the reliability of network communication, the security of data, and personal privacy. Students will learn how the Internet connects computers all over the world by the use of networking protocols.

Objectives / Topics Covered	<ul style="list-style-type: none"> ● Introduction to the Internet ● Notational Systems ● Data Representation ● Internet Hardware ● Internet Addresses ● Domain Name System (DNS) ● Routing ● Packets and Protocols ● Protocols and Standards ● Impact of the Internet ● Advanced Networking
Example Assignments / Labs	<ul style="list-style-type: none"> ● Introduction to the internet <ul style="list-style-type: none"> ○ What is the Internet? How does it work? What has been its impact on society? ○ Why do we need protocols for the Internet? ○ Example Activity <ul style="list-style-type: none"> ■ Explore the different levels of the internet. ● Decimal to Binary

- Hexadecimal
- Bits to ASCII
 - Hello World in Bits
- Internet hardware
 - Vocabulary: bandwidth, bitrate, latency
 - Why are protocols so important?
 - How do we send data over the Internet?
 - Example Activities
 - Explore how data is able to be transmitted across the ocean by using underwater cables
 - Explore the role of simple and complex networks and routers
- Internet Addresses
 - Vocabulary: Internet Protocol (IP)
 - How do IP addresses compare to postal addresses?
 - How do IP addresses work?
 - Example Activities
 - Explore the differences between IPv4 and IPv6. Why are we running out of addresses?
 - Trace a website request from the server, through the network, and to your computer
- Domain Name System (DNS)
 - How does DNS help with sending digital information and IP addresses?
 - Example Activities
 - Explore the process of how requesting a web resource works
- Routing
 - How is routing used to send messages/data?
 - Why is redundancy a good thing for the Internet? (fault-tolerant)
- Packets and Protocols
 - How data is transmitted?
 - How are internet packets able to find their way to your computer?
 - Example Activities:
 - Explain in your own words how a request from your computer travels through the various levels of servers to reach and return the correct webpage and resources?
 - As a class, create a protocol that will allow one classmate to send another classmate a note, without the need for talking to each other.
 - What are the standard protocols for the Internet and how do they work? (TCP/IP, HTTP)
- Protocols and Standards
 - What are the protocols used in sending and receiving emails?
 - What is the difference between TCP and UDP?
 - What are the different wireless standards?
 - Example activity:
 - What frequency band(s) can be used with the 801.11ax standard?
 - What is a MU-MIMO device and how does it help the range of the signal?
- Advanced Networking
 - The OSI Model

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| | <ul style="list-style-type: none">○ Encapsulation○ Virtualization |
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