



Georgia Foundations of Secure Information Systems Syllabus

Course Overview and Goals

This course is designed for middle school students and will provide an exploratory foundation in information systems, networking, and cybersecurity. It is designed to be taught in a 9-week rotation in 45-minute daily classes. Through integrated instructional activities, students will have opportunities to apply employability skills and to research possible career options in the information technology area. They will also complete many hands-on activities to build a strong foundation in computer hardware and connectivity. Capstone projects Students who successfully complete this course will be prepared for the following pathways upon entering high school: Information Support & Services, Networking, and Cybersecurity. This course may be taught in 6th, 7th, or 8th grade.

Learning Environment: The course utilizes a blended classroom approach. The content is fully web-based, with students writing and running code in the browser. Teachers utilize tools and resources provided by CodeHS to leverage time in the classroom and give focused 1-on-1 attention to students. Each unit of the course is broken down into lessons. Lessons consist of video tutorials, short quizzes, example programs to explore, and written programming exercises.

More information: Browse the content of this course at <https://codehs.com/course/8000>

Prerequisites

The Georgia Foundations of Secure Information Systems course is designed for complete beginners with no previous background in computer science. The course is highly visual, dynamic, and interactive, making it engaging for new coders.

Course Breakdown

Module 1: Networking Fundamentals (10 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. We will learn how the Internet connects computers all over the world. Finally, we will explore basic networking protocols, practical networking, and how networks are secured.

Browse the full content of this module at <https://codehs.com/library/course/8000/module/11606>

Objectives / Topics Covered	<ul style="list-style-type: none">• Introduction to the Internet• Internet Hardware• Internet Addresses• Domain Name System (DNS)
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	<ul style="list-style-type: none"> ● Routing ● Packets and Protocols ● The Internet and Cybersecurity ● Impact of the Internet ● Network Attacks ● Securing a Network
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 have 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. ● Internet hardware <ul style="list-style-type: none"> ○ Vocabulary: bandwidth, bitrate, latency ○ Why are protocols so important? ○ How do we send data over the Internet? ○ Example Activities <ul style="list-style-type: none"> ■ 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 <ul style="list-style-type: none"> ○ Vocabulary: Internet Protocol (IP) ○ How do IP addresses compare to postal addresses? ○ How IP addresses work? ○ Example Activities <ul style="list-style-type: none"> ■ 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) <ul style="list-style-type: none"> ○ How does DNS help with sending digital information and IP addresses? ○ Example Activities <ul style="list-style-type: none"> ■ Explore the process of how requesting a web resource works ● Routing <ul style="list-style-type: none"> ○ How is routing used to send messages / data? ○ Why is redundancy a good thing for the Internet? (fault tolerant) ● Packets and Protocols <ul style="list-style-type: none"> ○ How data is transmitted? ○ How are internet packets able to find their way to your computer? ○ Example Activities: <ul style="list-style-type: none"> ■ 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) ● The Internet and Cybersecurity

	<ul style="list-style-type: none"> ○ What are cybercrime and cyberwarfare? ○ How do we network attacks? (certificate authorities, public key encryption) ● Network Hacks <ul style="list-style-type: none"> ○ What are common network attacks? ○ Explain common network attacks and how they happen. (DNS spoofing, DoS/DDoS, Waterhole attacks, fake WAP, eavesdropping) ● Securing a Network <ul style="list-style-type: none"> ○ How can we detect intrusions? (checking logs, firewall rules, intrusion detection systems - IDS) ○ What are some recommended approaches for mitigating or preventing network attacks?
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Module 2: Project: The Effects of the Internet (5 hours)

In this project, students will choose an innovation that was enabled by the Internet and explore the positive and negative impacts of their innovation on society, economy, and culture. Students will develop a computational artifact that illustrates, represents, or explains the innovation's purpose, its function, or its effect.

Browse the full content of this module at <https://codehs.com/library/course/8000/module/11612>

Module 3: Cybersecurity and Digital Citizenship (20 hours)

This module gives an introduction to cybersecurity. It focuses on why cybersecurity is important, recent threats to cybersecurity, and different careers in the field.

Browse the full content of this module at <https://codehs.com/library/course/8000/module/11607>

Objectives / Topics Covered	<ul style="list-style-type: none"> ● Course Overview ● What is Cybersecurity? ● Impact of Cybersecurity ● The CIA Triad ● Privacy and Security ● Information Literacy ● Creative Credit and Copyright ● Hacking Ethics ● Cryptography, Cryptology, Cryptanalysis ● Hash Functions
Example Assignments / Labs	<ul style="list-style-type: none"> ● Course Overview <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:
 - 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
 - Why do we care about cybersecurity?
 - What information is at risk?
 - What are the impacts of cyber attacks?
 - Financial impact
 - Cybersecurity workforce
 - What are current cybersecurity career?
 - Example activities:
 - Review resources and reflect on or discuss
 - What information do cyber criminals steal?
 - What do cyber criminals do with stolen information?
- The CIA Triad
 - What is the CIA triad? (confidentiality, integrity, availability)
 - What are “secure systems?”
 - What do confidentiality, integrity, and availability mean in cybersecurity?
 - Example activities:
 - Determine where scenarios break part of the CIA Triad
- Cyberbullying
 - What is cyberbullying?
 - What are the impacts of cyberbullying?
 - Are there cyberbullying roles?
 - What do you do if you are being bullied?
 - What do you do if you see bullying?
 - How can you be an upstander?
 - Example activities:
 - Explore cyberbullying scenarios: What would you do?
- Privacy and Security
 - 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:
 - Test out various passwords on a site
 - Explore Google’s privacy policy: What do they know about you?
- Creative Credit and Copyright
 - What is copyright?
 - What are the different types of copyright licenses
 - Example activities:
 - Create citations for sources
 - Explore image search tools
- Hacking Ethics
 - What are hackers?
 - Are there different kinds of hackers? (white, black, grey)
 - What are bug bounty programs?

	<ul style="list-style-type: none">○ Is hacking always illegal?○ What are the consequences of illegal hacking?○ Example activities:<ul style="list-style-type: none">■ Explore what penetration testing is■ Sign ethical hacker agreement● Cryptography, Cryptology, Cryptanalysis<ul style="list-style-type: none">○ Why do we need some secrecy in our transparent information age?○ Explain general encryption with data, keys○ Example activities:<ul style="list-style-type: none">■ Video and discussion on securing the cloud■ Passing notes in class (offline activity)
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Module 4: Project: PSA (5 hours)

In this project, students create a final project by creating a PSA (Public Service Announcement) to teach their peers about a selected topic from the course. They can make a video, song, poster, or slideshow.

Browse the full content of this module at <https://codehs.com/library/course/8000/module/11608>