

## Cybersecurity 1A

### COURSE DESCRIPTION

#### **Cybersecurity 1A**

We depend more on the technologies we interact with every day; and we put more and more of our personal data out there online. Can all of that data really be kept “secret”? Learn about the various parts of your computer, how they work together, and how you can manipulate them to keep your data safe. Dive into the tools, technologies, and methods that will help protect you from an attack and discover the many opportunities in the rapidly growing field of cybersecurity.

### COURSE METHODOLOGY

- This is an inquiry-based course. Students will generate knowledge through online readings, asynchronous discussions with students and their instructor, interactions with online tutorials, and online and hands-on simulations.
- The instructor will act as a guide, a facilitator, an events planner, and a resource advisor. He/she will always be available through course message.
- The student must actively construct and acquire knowledge by being intrinsically motivated to succeed. To succeed, students must participate and complete all readings and activities. This course requires the student’s active participation.
- Both formal and informal assessment methods will be used in the course. Informal assessment will include an evaluation of the quality and timeliness of participation in class activities. Formal assessment may include multiple-choice quizzes, tests, discussion board participation, and written assignments. A final exam will be given at the end of the course.

### COURSE PARTICIPATION OBJECTIVES

This course for which you are registered is a college preparatory, academically rigorous course that covers an entire semester’s worth of material. As such, it is important that you adhere to the following guidelines as you manage your time and commit to successfully completing all required coursework:

1. The requirements for this course are equivalent to completion of minimum of 90+ hours of class instruction at a traditional on-site high school
2. Assignments must be submitted for each unit as they are completed so that the teacher may review and assess your performance. Do not hold your work, you must submit each unit’s homework as it is completed, demonstrating weekly assignment completions

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3. You must log in regularly to your course to demonstrate continued participation, and completion of all course requirements, including assignments, assessments and discussion forums
4. You must complete your individual work and any incident of suspected cheating, plagiarism or collaboration on assignments violates the academic integrity expectations outlined at the time of your enrollment and can result in failure of the course or further action as deemed appropriate

### **Citizenship**

Students are expected to conduct themselves in a responsible manner that reflects sound ethics, honor, and good citizenship. It is the student's responsibility to maintain academic honesty and integrity and to manifest their commitment to the goals of NUVHS through their conduct and behavior. Students are expected to abide by all NUVHS policies and regulations. Any form of academic dishonesty, or inappropriate conduct by students or applicants may result in penalties ranging from warning to dismissal, as deemed appropriate by NUVHS.

### **Communication**

Throughout this course students will need to be in close contact with their instructor and fellow students. Students are expected to communicate via course message and electronic discussion boards. Therefore, students should plan on checking their course messages at least three times a week and participate in the discussion boards during the weeks they are live.

Instructors strongly encourage and welcome open communication. Clear, consistent, and proactive communication will ensure a successful experience in this course. It is the student's responsibility to notify the instructor immediately if and when a personal situation occurs that affects his/her performance in this class. Being proactive with communication will result in a quick solution to any problems that may occur.

COURSE SYLLABUS

**COURSE OUTLINE**

**Unit 1 – Basics of Cybersecurity**

Today, people carry the world around in their pockets. That’s right—the *world*. At any given moment, we have the power to seek, find, and interact with just about any kind of information we want via the internet. But it’s not all open doors and friendly faces out there in cyber space. As we continue to navigate our online landscape, it becomes clear it can be a dangerous place indeed, especially if we don’t take the right precautions. Passwords, codes, verification questions—these all serve as watchdogs for our data, but it’s important to remember there are also clever people out there who are adept at sneaking around these safety measures. By looking critically at the connectivity of the internet, it’s easy to see how the pathways of communication can also become avenues for attack. This is the founding notion behind cybersecurity and the exact reason why—many years and several hundred billion dollars later—its efforts still struggle to keep pace with hackers and online threats. And in this brave new cyber reality, learning the ins and outs of the world you carry in your pocket has never been more important.

**Learning Objectives**

- Use cybersecurity terms effectively
- Explain the essential differences between cybersecurity and information assurance
- Describe the importance of information within cyberspace
- Understand the security triad model, or the AIC triad, and how it relates to cyber security

**Activities**

Unit 1 Text Questions	Homework	10 points
Unit 1 Online Lab Questions	Homework	10 points
Unit 1 Discussion 1	Discussion	5 points
Unit 1 Discussion 2	Discussion	5 points
Unit 1 Quiz	Quiz	15 points

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**Unit 2: Computers and Operating Systems**

Our personal computers, tablets, and smartphones offer different user options, but they all have one thing in common—operating systems. Since an operating system (OS) is what makes everything on your device run smoothly, it would be pretty terrible if it were to be compromised. Recognizing how our OSes govern what our technology can do is an important part of being a savvy user and crucial to effective cybersecurity. Being a well-protected online adventurer demands more than just a basic understanding of the computer itself; it requires some knowledge about the strengths and weaknesses of the components that live inside the device as well.

**Learning Objectives**

- Compare and contrast memory technologies
- Identify different kinds of software and how they apply to cybersecurity
- Explain the differences between operating systems and how they compare
- Understand basic computer components, as well as their functions and operation

**Activities**

Unit 2 Text Questions	Homework	10 points
Unit 2 Online Lab Questions	Homework	10 points
Unit 2 Discussion 1	Discussion	5 points
Unit 2 Discussion 2	Discussion	5 points
Unit 2 Quiz	Quiz	15 points

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**Unit 3: Networking Fundamentals**

When people “network,” they come together to share information and stay connected. And in that way, you can have a network of friends, a network of systems, or a network of ideas. Computers are similar—they must also join together for the purpose of sharing resources and communicating. This can include sharing anything from a printer to a file server, but the most valued and popular resource today for human connection is the internet. Once we begin to learn how a network really functions and what it can do, it will be easier to understand the vast and complicated world of cybersecurity. Sharing ideas, images, and resources is what makes the world go ‘round, and networks are what form the backbone of this new reality. As the ways and means of connecting and sharing become increasingly complex, so will our need to secure our computer networks, and developing them in innovative ways will become one of the most important challenges we face.

**Learning Objectives**

- Describe the different computer networks, their characteristics, and how they function
- Explain how the seven layers of the Open Systems Interconnection (OSI) model function
- Compare and contrast network topologies
- Identify the different protocols commonly used in a network environment

**Activities**

Unit 3 Text Questions	Homework	10 points
Unit 3 Online Lab Questions	Homework	10 points
Unit 3 Discussion 1	Discussion	5 points
Unit 3 Discussion 2	Discussion	5 points
Unit 3 Quiz	Quiz	15 points

COURSE SYLLABUS

**Unit 4: Network Security**

Some people might say we already have all the tools we will ever need to protect ourselves from cyberattacks; we just need to learn from the world around us and find ways to use them effectively. Humans have been in conflict since the beginning of time, and technology’s new landscape of virtual warfare is simply an extension of this ongoing condition—the modern battlefield, if you will. Just as our weapons arsenal has expanded over thousands of years from clubs and arrows to machine guns and bombs, the practices of cybersecurity are in the midst of their own mighty evolution. Understanding how a network provides the backbone for communication is just one step in visualizing how we can protect the vitality of our online platforms. From application security to firewalls, guardianship of our virtual world is no small task. But if the defenses of the real world are any indication of our ability to protect ourselves, there’s always a way to stay ahead of any threat. We just have to learn how.

**Learning Objectives**

- Describe how to configure and assess the security of firewalls
- Explain how network configuration factors into cybersecurity
- Identify key components of network security and how they can be achieved
- Understand how the performance, efficiency, and security of a network can be established and maintained

**Activities**

Unit 4 Text Questions	Homework	10 points
Unit 4 Online Lab Questions	Homework	10 points
Unit 4 Discussion 1	Discussion	5 points
Unit 4 Discussion 2	Discussion	5 points
Unit 4 Quiz	Quiz	15 points

**Midterm Exam Objectives**

- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from the first four units in this course (Note: You will be able to open this exam only one time.)

**Midterm Exam Activities**

Midterm Discussion	Discussion	5 points
Midterm Exam	Exam	50 points

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**Unit 5: Access Control**

One of the biggest vulnerabilities in technology today is the lack of access control. If an online attacker is able to find just the right code, password, or tactic to gain passage through certain obstacles, the treasure of personal data is ripe for the picking. In this way, access is the prized gateway and the main objective of any savvy cybercriminal. And as such, access control is also a security point that requires the utmost attention and support. Understanding how data can be accessed (and what can be done to prevent it) sits at the core of any meaningful cybersecurity effort. Doors of entry and the locks that protect them—in the real world and the cyber one—come in all shapes and sizes, and you need to understand every inch of this digital environment if you hope to protect it.

**Learning Objectives**

- Understand how to properly secure a computer network
- Explain various methods of access control in computer security
- Explore the benefits of using a virtual private network (VPN)
- Describe the basic methods of authentication and remote access control

**Activities**

Unit 5 Text Questions	Homework	10 points
Unit 5 Online Lab Questions	Homework	10 points
Unit 5 Discussion 1	Discussion	5 points
Unit 5 Discussion 2	Discussion	5 points
Unit 5 Quiz	Quiz	15 points

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**Unit 6: Mobile Devices and Cloud Computing**

These days, everybody wants their internet connection wherever and whenever they feel like checking in with work and friends, or any other wide array of internet services. And luckily for them, the invention of mobile devices with full operating systems and network accessibility has made that desire a reality. In fact, experts say 70 percent of all online activity is now generated through some kind of mobile use, which means all the security measures originally designed for those big desktop computers must now be applied to our smartphones and other portable devices in a myriad of new ways. It turns out that virtual and wireless worlds, complete with cloud computing abilities that can store, process, and transit information on the go, offer a lot of technological convenience, but unfortunately, they have also introduced a great deal of cyber risk.

**Learning Objectives**

- Identify the possible exploits in mobile applications
- Understand and assess the security of mobile devices
- Demonstrate an understanding of virtualization technology
- Explain common risks associated with wireless networks

**Activities**

Unit 6 Text Questions	Homework	10 points
Unit 6 Online Lab Questions	Homework	10 points
Unit 6 Discussion 1	Discussion	5 points
Unit 6 Discussion 2	Discussion	5 points
Unit 6 Quiz	Quiz	15 points



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**Unit 7: Protecting Data**

Although it can be tempting to place our most precious assets under lock and key, such a heavy-handed security approach is just not practical. Digitally speaking, your information must have the freedom to move around the internet—connecting, sharing, transmitting, and making the technological world turn. So, the question then becomes, “How do you keep data safe while still allowing it to roam freely?” The answer is two-fold, as it demands a thorough understanding of both the physical and virtual realms of cybersecurity. Now that you understand the paths data takes while traveling through networks and the hardware involved with keeping it safe, it’s time to dig into encryption, application security, and other effective ways to “harden” and safeguard your valuable data. If walking along a well-protected road makes you feel more confident, you will likely appreciate how cybersecurity’s layered approach is akin to camouflaging yourself or traveling in a bulletproof car. In the event of a real threat, even the smallest additional protections could be helpful. In reality, hackers are likely never going to disappear entirely, which means our approach to safety in our journey through cyberspace must be balanced, well-rounded, and as thorough as possible.

**Learning Objectives**

- Recognize what it means to protect data in motion
- Identify effective methods of data protection, both physical and virtual
- Understand the history of encryption and how it is used in a digital setting
- Evaluate environmental controls and other components of physical security
- Describe the different processes involved with secure data use and disposal
- Explain the techniques of system hardening and how they protect computer systems

**Activities**

Unit 7 Text Questions	Homework	10 points
Unit 7 Online Lab Questions	Homework	10 points
Unit 7 Discussion 1	Discussion	5 points
Unit 7 Discussion 2	Discussion	5 points
Unit 7 Quiz	Quiz	15 points

COURSE SYLLABUS

**Unit 8: Trends and Challenges**

Just like any profession, recognizing the current trends and challenges within the cybersecurity field is one of the best ways to truly understand it. From cyber terrorism to ransomware attacks to the Internet of Things, the digital landscape of today is far more complicated and dangerous than ever before. Establishing proper habits of digital citizenship and taking responsibility for your online information are just a couple of the ways you can become a well-seasoned and knowledgeable professional. The digital arms race between malicious actors and the powers of good has never been more heated, as individuals around the globe struggle to predict and understand the many ways an attack can harm vital infrastructure and threaten human life. This is no small effort and demands that experts and users alike stay vigilant, well-informed, and ready to fight for their digital safety.

**Learning Objectives**

- Define cyber terrorism and the way it threatens public infrastructures
- Explain the Internet of Things (IoT) and its significance in cybersecurity
- Recognize current trends in cyberattacks and the strategies used to combat them
- Identify the key legislative acts that impact cybersecurity
- Understand the larger process of pursuing cybersecurity as a professional skillset

**Activities**

Unit 8 Text Questions	Homework	10 points
Unit 8 Online Lab Questions	Homework	10 points
Unit 8 Discussion 1	Discussion	5 points
Unit 8 Discussion 2	Discussion	5 points
Unit 8 Quiz	Quiz	15 points

**Final Exam Objectives**

- Review information acquired and mastered from this course up to this point.
- Take a course exam based on material from units five to eight in this course – the last four units. (Note: You will be able to open this exam only one time.)

**Final Exam Activities**

Class Reflection Discussion	Discussion	10 points
Final Exam	Exam	50 points

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**HOW YOU WILL BE GRADED**

**For critical thinking questions**, there are no right or wrong answers. For example, a question on your thoughts on why you think people are shy is a pretty open-ended type of question. Grades will be based on the depth of personal insight you present. **Do not simply agree or disagree** with an insight question. We are looking for critical thinking and possibly a related personal experience with the question.

**It is important to provide detailed answers for insight/opinion questions.**

**For review questions**, you should be produce a more academic answer. For example, "What two categories are norms divided into?" This type of direct question requires a specific answer. Please use full sentences and proper grammar.

**When submitting paragraphs**, use these guidelines.

1. The first, second or last sentence contains the main idea and key words from the question or assigned topic.
2. Paragraph contains one to three explanatory sentences.
3. Paragraph contains two to four sentences about specific details related to question.
4. Details are colorful, interesting and appropriate.
5. Paragraph ends with a good closing sentence that refers to the main idea without repeating it.
6. Free of spelling and grammatical errors.

**GRADE SCALE**

The following grading scale will be used to determine your final letter grade.

Letter Grade	Percentage Earned
A	95%+
A-	90% - 94.9%
B+	87% - 89.9%
B	84% - 86.9%
B-	80% - 83.9%
C+	77% - 79.9%
C	74% - 76.9%
C-	70% - 73.9%
D+	67% - 69.9%
D	64% - 66.9%
D -	60% - 63.9%
F	59% and lower

## COURSE SYLLABUS

### **SUPPORT**

At NUVHS you will have access to multiple support teams. Who you contact will depend on the questions you have. Always start by contacting your teacher through the Message Center in the course. Your teacher should be able to answer your question, but if they can't, then they will direct you to another support team. If you have questions about any of the course content, your grades, or course policies, you should contact your instructor.

For questions about your enrollment, transcripts, or general school-wide policies, you can contact **NUVHS Student Services** at [info@nuvhs.org](mailto:info@nuvhs.org) or by phone at 866.366.8847. For example, if you would like to withdraw from your course, you should contact Student Services. Please note that a refund for your course can only be obtained if you drop within the first seven days of enrolling in the course.

For help with login/password issues, or other technical issues specific to the Blackboard website, you can contact the team at [National University Blackboard Learn](#). They can also be reached by phone at (888) 892-9095.

### **EXPECTED SCHOOL-WIDE LEARNING RESULTS (ESLRs)**

#### **Engaged Learners**

- Demonstrate self-directed learning skills such as time management, and personal responsibility through the completion of course requirements
- Develop an understanding of their own preferred learning styles to enhance their overall academic potential
- Incorporate effective and relevant internet and multimedia resources in their learning process to broaden their knowledge base

#### **Critical Thinkers**

- Effectively analyze and articulate sound opinions on a variety of complex concepts
- Illustrate a variety of problem-solving strategies that strengthen college preparation and workforce readiness
- Formulate a framework for applying a variety of technology and internet-based research to enhance information literacy and collaborative thinking

#### **Effective Communicators**

- Demonstrate awareness and sensitivity to tone and voice in multiple forms of communication
- Express concepts and ideas in a variety of forms
- Enhance communication skills through the use of media rich or other technology resources



## COURSE SYLLABUS

### **Global Citizens**

- Appreciate the value of diversity
- Understand the range of local and international issues facing today's global community
- Demonstrate awareness of the importance of cultural sensitivity and social responsibility in the 21st century