

IDS 493 Reflection Essay

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Interdisciplinary Studies 493

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April 27, 2025

Introduction

E-portfolios are an excellent way to showcase your top skills. The portfolios give you an avenue to not only show what skills you have, but also to show how much you have developed those skills with specific examples. My education at Old Dominion University has given me the opportunity to see what specific disciplines entail, and it has helped push me in a direction that will give me the career path I am striving for in the coming years. I started with studying Cybersecurity, but then later switched to the major of Cyber Operations, because I found the degree to be more engaging to learn about and overall more interesting to me. The Cyber Operations program here at Old Dominion has helped me develop several necessary skills that I will definitely need to excel in my career path starting this year. The top three skills that stand out to me include the technical skills within my field of study, problem-solving, and adaptability and continuous learning.

Technical skills

The technical skills for Cyber Operations are some of the most important skills that I could learn to succeed in my career path. Skills such as knowing how to analyze network traffic using programs such as Wireshark, knowing how to ethically hack from a theoretical stance, and being able to know my way around a virtual machine are key in cybersecurity-related fields.

Artifact 1: CS 466 - Lab 1 IoT Network Analysis

In my CS 466 class, Principles of Cyber Defense, I learned about the necessary principles of Cybersecurity through multiple hands-on labs. One of the hands-on labs which really stood out to me was “IoT Network Analysis.” This lab had the class download and analyze recorded

traffic, which is then saved inside a PCAP (Packet Capture) file with a program called Wireshark. This lab taught me how to read and identify specific information, such as MAC addresses, IP addresses, and protocols of certain IoT devices.

Artifact 2: CYSE 301 - Assignment #4 Ethical Hacking

CYSE 301 was one of my earliest introductions to various cybersecurity-related subjects through hands-on labs. I learned how to configure firewalls, how to scan networks with Nmap, and how to use Metasploit to gain access to a vulnerable system. This lab was my first introduction to Metasploit and how to use the program to gain entry into a system. In these labs, we never used Metasploit on real systems. Instead, we only infiltrated other virtual machines that we had set up on the same network. The lab started with scanning a Windows 2008 server virtual machine for vulnerabilities using Nessus, and then using Metasploit, we would gain access to the virtual machine.

Artifact 3: Oracle Virtual Machine

I have a couple of personal projects throughout the years that I was able to do using the knowledge I acquired, and one of them was an Oracle virtual machine. I set up this Oracle virtual machine primarily for fun with my friends. I can host servers for different games on this virtual machine. This helped me get more hands-on experience with virtualization, network configuration, and administration. When something would go wrong with the server, it would be up to me to diagnose and then figure out how to fix the problem.

Problem Solving

Problem-solving is an essential skill to have within my degree, especially when it comes to cybersecurity-related topics. It is vital to be able to correctly and efficiently describe what the problem is and create a solution for said problem. I have trained my problem-solving skills throughout many projects in and outside of school, such as building my own personal computer, final programming projects for Microcontroller courses, and discovering how to find solutions for problems related to Cybersecurity in our society.

Artifact 1: My Personal Computer

In late 2023, I built my own personal computer. I had to do all the necessary research to ensure all the sourced computer parts were compatible and then I had to assemble all the parts to have a correctly operating computer. Even though I was watching guides, because it was the first time I was building a computer on my own, I still came across many issues that had to be solved in real time. Because of the issues that arose, I gained a lot of experience with troubleshooting and learning how to fix the problems that I diagnosed. When building a computer, a multitude of things could be going wrong at all times, so it is necessary to rule out certain things when you are trying to fix an issue.

Artifact 2: ECE 346 Final Project

I have had many projects in my Computer Science courses during the course of my time in school, like making small games, but ECE 346 made me think much deeper about these projects. This course had me programming in ARM assembly, so I had to think more about how the data was being moved around at a bit-by-bit level. The course also had me using a small microcontroller, which I could connect to bread boards to control input and output with switches.

The project had two parts. For the first part, I programmed the Fibonacci sequence, but I also had to be able to control how many numbers the sequence would go with switches on a breadboard hooked up to the microcontroller. In the second part of the project, I programmed a bubble sort. In higher-level languages, these tasks would normally not be too difficult, but because I had to do it with ARM assembly, I had to think more about how the data would be moved around.

Artifact 3: CYSE 425W Paper One - Policy to Include Cybersecurity Into the Standards of Learning

CYSE 425W was a course that focused on Cybersecurity strategy and policies, so this course had a series of essays that surrounded a chosen topic. My topic for these papers was to figure out a policy that included cybersecurity in the standards of learning. I thought that because technology is everywhere, there could be a lot of children who do not know proper safety on the Internet. My proposal was to include Cybersecurity education in the standards of learning for grade school children. This course taught me how to really think and solve societal issues instead of just solving homework problems. I learned to reflect on the larger need for cybersecurity in the world.

Adaptability and Continuous Learning

Technology in Cyberspace is evolving rapidly, which means skills such as being able to continually adapt and learn are essential to being on top of your field. Throughout my academic career, I have sought out many different ways to increase my knowledge in different areas. Learning new computer languages, learning about the evolution of cyberattacks, and learning about the ethics of Cybersecurity have all helped me develop a mindset to continuously grow.

This is a fast-paced field in a fast-paced world. You need to be always vigilant with your learning and skills.

Artifact 1: Computer Languages - ECE 241: Lab 4 - VHDL

During my time at Old Dominion University, I had to learn a couple of different computer languages. My fundamental Computer Science courses started with learning C++, but I then later touched a little bit on Python and x86 Assembly in my CS 467 Intro to Reverse Software Engineering. In my Computer Engineering Fundamentals and Microcontrollers courses, I learned about breadboards, circuits, VHDL, and ARM Assembly. In ECE 241 Fundamentals of Computer Engineering, we built circuits on breadboards, which were then hooked up to FPGA microcontrollers. We were able to program these microcontrollers using the computer language VHDL. This was my first ever instance of hearing about this computer language, so at first, I struggled a little, but in later labs, I got the hang of the language.

Supporting Artifact 2: History of Cyber Attacks

This was a long-term project, where we had to choose a topic and create a 10-15 minute presentation about said topic. I choose a relevant topic that was in my field of study, but I wanted to learn about something I have not delved much into, prior to the project. I decided to do a presentation on the History of Cyberattacks. I learned a lot about how cyberattacks have evolved over the years and how cyberattacks have changed. People are becoming more sophisticated in their attacks, and attacks change over time. It was very interesting to dive deeper in to this for my extended project.

Supporting Artifact 3: Cybersecurity Ethics - Course Reflective Paper

This reflection outlines some of the topics I have learned in my Cybersecurity Ethics course. While topics like philosophy and ethics are not always the most fascinating to me, I do know that they are essential topics that are very important and relevant to learn and discover on a deeper level. They taught me how to think through moral and ethical dilemmas and how to analyze them to figure out a way forward and solve them. This course was also an excellent opportunity for me to hone my writing skills and work on being a better writer. The course was very writing-intensive, which is something outside of my comfort zone.

Conclusion

Looking back on my time at Old Dominion studying Cyber Operations, I see that I have grown a lot academically and personally. I have learned and cultivated many skills that will help me throughout my future career in the coming decades. The Cyber Operations concentration has taught me many technical skills, including analyzing network traffic with Wireshark, how to ethically hack with Metasploit, and a personal project including how to set up and port forward a virtual machine. There have also been many ways that I have developed my problem-solving skills. These include building a personal computer to help me learn a lot about trouble shooting, my ECE 346 final project showed me how to think about computer programming from a lower level, and my CYSE 425W paper taught me how cybersecurity can help fix some problems in Society, such as how to help educate some people on how to keep themselves safe while on the Internet. I am glad that my major in Cyber Operations has taught me so many things outside of just the technical skills. I have been able to adapt and continually learn so many different topics throughout my major. I have touched on many different computer languages that will help me

throughout my career, I have learned a little bit about the history of cyber attacks, and I have honed my reading and writing skills in a Cybersecurity Ethics course.