

Individual Capstone Assessment
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Our senior design project is a web-based cybersecurity education framework. This platform will offer a variety of support for various topics. For example, we want to create visualizations for complicated cybersecurity concepts, such as a Buffer Overflow attack. We will also create step-by-step walkthrough tutorials to go along with the visualizations. For now, we anticipate only developing a few of these kinds of tutorials. However, this project is very scalable, so we can continue to add new content as time permits. On the technical side, we will use a development stack that includes technologies such as JavaScript, React, and Node.js to build our web application.

There are many parts of my college curriculum that will assist in this project. First, I am completing the Cyber Operations undergraduate certificate, so I have taken many different courses covering a wide range of topics under the umbrella of cybersecurity: technical and more policy related. This is also the largest scale project I have ever done in an academic setting. Parts of the Software Engineering course we took third year will be essential in organizing, planning, and tracking all elements of this project. Ensuring that we stay organized will be essential in making sure our team is working efficiently and progressing towards our end goal. It is easier to manage projects when working independently, so there will be a learning curve with distributing elements to all the group members.

My co-op experiences will also benefit in the management and technical completion of this project. I spent my first two semesters at L3Harris doing Software Engineering in their Integrated Mission Systems sector. During this time, I was able to develop skills in software architecture as I helped develop a regression testing framework using PyTest. My last three co-ops were with Northrop Grumman doing Cyber Systems Engineering. Here, I was able to experience how cybersecurity works alongside software development. Also, during my first rotation at Northrop Grumman, I acted as a scrum master for a small IRAD team. Although that responsibility only lasted a few weeks, it was still very valuable to experience software development through the lens of a project manager. I am hoping to draw from that role to assist in timeline management and planning.

During the preliminary brainstorming session for project ideas, all four of us in the group entertained aligning our project with education. Since my academic focus is cybersecurity, I had the idea to make a website where students can learn and practice different cyber concepts. Our senior design advisor, Professor Giovanni Abulaitah, specializes in networking and cybersecurity. Coincidentally, our initial idea for an online cyber education platform was something he already had in mind. He expressed how an online tutorial/walk-through program for complicated and difficult to visualize concepts would be game changing for his students. This kind of education

tool is something he would like to use with his students to supplement his own curriculum. I feel motivated for this project not only because it is made to help students, but also because we know there is already a space where our web application will be utilized.

We have split up our team roles into front-end developer, back-end developer, schedule coordinator, and cybersecurity content developer. Ryan has been assigned the front-end developer, so his responsibilities will include developing the web application, user interface, and other visualizations required for the tutorials. Molly is the back-end developer, where her role will be to utilize different databases and servers to host our application. I am the cybersecurity content developer, which entails creating the tutorials, visuals, and all other educational content. Lastly, Emily is our schedule coordinator where she will be managing the workflow, organization, and timeline for our project. Our preliminary approach is for each person to do research on their assigned role. Then, once we have a decent understanding of the task and technologies at our disposal, we will reconvene and begin to break up development into milestones.