

## A Reflective Journey: Navigating Your Cumulative Experience at Iowa State University

My name is Michael S. Becker, and I am a senior studying Cybersecurity Engineering. As I assess my educational journey, I reminisce on my decisions to get me to a place where I feel ready to enter the workforce to apply my skills and experiences and make a difference in the world. When I joined Iowa State University, I had my eyes set on Aerospace Engineering, where I spent a year and a half studying. Halfway through my sophomore year, my passion for what I was learning was in the wrong place, and I decided to switch majors to cybersecurity engineering. Prior to changing majors, I took many engineering and math classes that created a great foundation to be successful within Cybersecurity. My overall time here at Iowa State University was flooded with diverse coursework and hands-on experiences that have taught me many life lessons. This coursework has shaped my ability to communicate to a multitude of audiences, make ethical and professional judgements, and become a continuous learner in order to succeed in my career and life.

Of all the skills I have acquired throughout my time at Iowa State University, hard work and problem-solving are the most impactful not only to my career but my personal life. In classes like Calculus II, Calculus 3, and Differential Equations, I learned the hard way that I would not be able to walk through these classes. Calculus II involved integration, polar coordinates, Calculus III involved a wide array of coordinate systems, partial derivatives, multiple integrals, and Differential Equations was surrounded by Laplace transforms and real-life applications of spring-mass systems. These classes were hard for me, as my fellow classmates passed with flying colors, I was suddenly stuck, and the lecture topics did not stick. I knew that in order to be successful, I needed to work harder and work smarter. Iowa State offers many different methods in order to be successful within a class, including office hours and SI sessions. I attended these to improve my grades. I needed to adapt to my learning capabilities and strategies in order to be successful. Through my failures and mistakes here at Iowa State, I have grown to become someone who faces their failures head-on and learns from their mistakes, constantly improving myself.

This concept also extends to my ability to recognize and solve complex engineering problems. Although classes like calculus and differential equations help, the classes that have truly impacted my career and abilities are CprE 230, CprE 231, and CprE 331. These classes have taught me to recognize vulnerabilities in security using modern-day Cybersecurity tools such as Nessus and Burp Suite. Within CprE 231 specifically, there was a final project that involved performing a risk analysis on a system, finding the vulnerabilities, and trying to exploit them while documenting the vulnerabilities in a professional manner. These classes taught me the professional process as well as the thought process in order to solve complex problems within the field of cybersecurity. They have taught me to think about these complex systems and networks in ways that have vulnerabilities and ways to gain more and more access through exploits.

Another major skill that I have refined here at Iowa State University is my ability to use external information and learn independently. Throughout my academic career, there have been many roadblocks and classes that have challenged me significantly. One of the most difficult classes that I have taken here at Iowa State was COMS 3110. This class also helped me develop a strong intuitive mind, which in turn helps me solve

complex engineering problems. Learning algorithm analysis and design methodologies forced me to look outside of the classroom for help. This class was about recognizing problem patterns and forming algorithmic solutions. Being in a technical field that revolves around algorithms, I understood that this class would be a great foundation for my future, and the process of identifying an issue and addressing it in an engineering-minded way. Finding resources all over the internet and honing in on different sites and communities helped me immensely; it not only taught me how to find external resources in general but also find the correct information in a quick and efficient way in order to benefit my learning.

Branching off from the topic of external resources, my time here made me very passionate about my future career. Classes such as Com S 309 and CprE 491/492 have taught me many key principles that are very applicable to my future. I had to find external resources in an unguided way, ask questions when I didn't know the answer, and work with strict deadlines in a team environment. These projects involved working with four or more people who have drastically different majors and, in turn, drastically different skillsets and backgrounds. In this team environment, we had to come together in order to reach a solution on how to solve a problem, keeping in mind our own strengths and weaknesses. This came with us finding professional ways to track our work, which introduced me to Agile methods as well as consistent, clear communication. These classes have taught me very important skills that I'll hold on to throughout my professional career. These classes have also included technical review panels where not only did we have

These classes also taught me that I need to keep updating my skillset in order to be successful in the field of Cybersecurity. During the production of our projects, which happened to both be applications, I learned that many of the tools used in school have undergone updates, and new methods and practices were now seen as the norm. Because of this, I wanted to get involved with students and other members of the Cybersecurity field in order to stay updated with the common methodology to be successful in the field. In order to implement the security practices in our web applications, I had to ask the cybersecurity community for help. I ultimately ended up joining HACC, a club here at Iowa State that helps me understand how to excel in the community and develop my skills outside of the classroom in order to help me within school and within my professional career. After finding much-needed information, I wanted to reach out to more people around my hometown of Naperville, Illinois, professionals in the field. After countless emails and connections on linked in I found myself in a community called BurbSec. This is a community of people in the Chicago-Land area that have provided me with great insight with security practices and how to navigate the professional world of cybersecurity. They have helped guide me to hack the box and leet code referencing specific practices they have faced and needed to know within their jobs as well as in interviews. I am grateful for the passion and foundational learning experiences Iowa State has taught me and believe that foundation guided me to become involved within my community of fellow cybersecurity engineers.

Stepping away from the realm of Cybersecurity, I have been involved in many classes that have shaped the way I view our world as a whole, politically, ethically, morally, everything. These classes that I have been exposed to me have helped shape my understanding of societal, global and environmental views. Some of the classes outside of my major include ECON 101, INTST 235 : Introduction to international studies, POL S 121: Introduction to International Politics and ARCH 321: History of the American City. In ECON 101 I gained a base understanding of economic systems and dynamics within the market, it covered every day

things you hear such as supply and demand. It has helped understand how incentives drive human behavior and thus translating to how people and businesses adopt technology. This has helped shape my view on how the world of cybersecurity works, specifically how companies will invest in security measures only if the expected cost of breaches and attacks outweigh that of preventing them. International Studies helped expose me to global perspectives with an emphasis on how geographic, economic and other characters make up different regions of the world. Looking back on the class it has helped me understand that different solutions and strategies must be applied in drastically different ways depending on what region of the world you are in. This being because of the different cultural contexts and economic conditions within the international market. Thinking about my future and potentially being able to design security architectures I now understand that not everything works like the United States, however simple that might sound, this understanding would help me understand the different processes and laws that have been crafted by geography, culture and politics in our vastly different world. History of the American City, taught the technological change, architectural change and the development of the United States from its conception till now. It has exposed me to how America has evolved and changed through laws enacted, to cultural issues and changes that have in turn influenced the cities and states around us. This has helped me understand that everything has a story and a past. Everything is always built off of something else whether that be physical or not and applying this to Cybersecurity has helped me recognize that many systems and technology in current companies will be built off of the backs of the previous practices, previous technology. This makes understanding the past a significant advantage.

Overall, these classes have helped me understand the complex relationships between culture, economics, politics, culture and human behavior. I believe this has created the basis of me being able to navigate the professional world as well as my life in a well educated, level-headed manner. These classes have helped me craft a broad perspective that will enable me to develop smart conclusions in the world, but also in my professional career.

My time at Iowa State University has helped me learn a lot about myself, it has helped prepare me for my future navigating the world as well as the workforce. The courses I have been involved in throughout my education have given me the tools to be successful in life, whether that be life long learning, communicating effectively and my exposure to different perspectives and cultures. My college experience has helped create an appreciation for continuous learning and most importantly hard work. I have had many ups and downs here at Iowa State University but appreciate every single moment. I know that the diverse coursework, the rigorous labs, the seemingly impossible tests have crafted a better person ready to make an impact. Iowa State has created many life long memories that I will cherish for the rest of my life.