

Looking back on my years at Iowa State, I am satisfied to see my development into a confident computer engineer that is ready to start a career. The class work at Iowa State has helped prepare me to succeed in creating processes to develop solutions to real world problems where no previous solutions exist. The hardest part of studying to be an engineer is to stop focusing on the answer to a problem, but instead focus on the process that leads to the solution. My time at ISU has also helped prepare me to work with others in a group environment, as most engineering offices are collaborative environments. ISU has also helped me recognize what issues are important for a computer engineer and what are the correct ethics to have in the workplace. All the material I have learned at Iowa State has helped me on projects inside and outside of the classroom, and will continue to prove its value in the future. Some of the projects outside of the classroom have been sponsored by Iowa State and helped me further proliferate my knowledge gained in the classroom. The knowledge gained from the classroom has also helped me in vital internship positions, which helped form a useful combination of classroom and workplace experience.

The computer engineering program at Iowa State did a terrific job of teaching me the whole stack of engineering computer systems. One of the first classes, Digital Logic, taught me the lowest level logic components that form the processors that power our modern day electronics. How these low level logic components are built is explained in the circuit analysis classes. These logic components were expanded in Computer Organization & Design, where the logic components are combined into modern processor architectures. The low level software that goes on these processors are described in Embedded Systems and Operating Systems. Then higher level software practices and object oriented design are explained in Introduction to Object-oriented Programming and Software Development Practices. The math used to prove the effectiveness of your software is provided in Design and Analysis of Algorithms. At this point a student at Iowa State has a strong concept of computer engineering from the transistor to a hash map. A student then has the chance to pursue their interests and specialize their knowledge in certain areas. I heavily enjoyed embedded systems, so I decided to take the 400 level Embedded Systems Design course offered at Iowa State to gain a stronger understanding of how to build and work with embedded systems. I have also enjoyed software development and wanted to learn more about the expanding field of big data by taking the Large Scale Data Analysis class. After leaving Iowa State I will be prepared to tackle problems that are presented from my field by having a strong conceptual understanding of computer engineering.

Besides gaining a strong conceptual understanding of computer engineering, the program at Iowa State has prepared me to work in professional group projects, taught me the contemporary issues facing computer engineering, and explaining the professional and ethical responsibilities that a computer engineer faces in the workplace. Almost all lab-based classes I have taken at Iowa State included working in groups to accomplish assignments. Since there were a large quantity of experiences, I have assumed a lot of different group roles and also had both good and bad experiences. A lot can be learned from all the experiences, especially the bad ones. The bad experiences can lead to learning lessons that led to better experiences in the future. A lot of the classes at Iowa State have also helped explain the contemporary issues that exist in the field of computer engineering. For example, it was explained in Computer Organization & Design that we are currently witnessing the end of Moore's law. This means that a new paradigm must be created for computers to significantly increase in performance like they have in the past. A student could be inspired by that lecture and dedicate themselves to helping find the next technology to increase performance in processing. Professional and ethical

responsibilities are also stressed in the classroom at Iowa State. Computer engineers develop critical systems that lives depend on. Because of the importance of the technology that we develop, we must be held to a high standard in order to develop products that can also have a high standard.

My approach to learning and problem solving was heavily influenced after taking the intro circuits class at Iowa State. I took the class over a summer session and ended up in a ten-student class taught by Professor Mina. The class was somewhat weird, where most of the time spent in class was not lecturing, but instead small groups of us working together to solve circuit problems. Mina emphasized that mimicking problem solving is the lowest level of learning, and that student must strive towards emancipating their knowledge by gaining a strong understanding of the concepts behind the problem solving tools that are used. This significantly changed how I approached learning in class, where I spent more time focusing on working through a problem instead of just finding a solution as quick as possible.

My attitude towards engineering also has changed after participating in several hackathons hosted by Iowa State. I saw that there is always something new to be learned when working on a project. It also became apparent after working on a project with no clear lab document that the path from start to finish is a lot more unclear. This ambiguous path is probably one of the most daunting things for an engineering student. Instead of a straight line, the path looks more like a maze. There will be a lot of dead ends in the path, which represent failures or times where the project needs to switch directions.

A student needs to become comfortable with failure to truly succeed in the workplace. Failure is not a comfortable feeling and most people end up trying to avoid that feeling. The problem is that by avoiding failure, people tend to take less risks. The key is that the more times someone fails, the more used to that feeling one becomes. Over time the feeling of failure hurts less, so taking risks don't seem as scary. When a student realizes this, they are able to work on projects more effectively and also succeed more in life. For myself, I have started working on personal projects to develop my portfolio and also proliferate the knowledge I have gained by attending Iowa State University. There are plenty of times I have failed or made mistakes in my projects. At first it was not enjoyable, but at this point I recognize that it comes with making progress.

My time at Iowa State feels like a large project. I made a lot of mistakes while getting my degree and have failed plenty of times. However, I don't think I would change anything. The mistakes I made taught me important lessons that helped me succeed after applying the lessons. The lessons learned have led to a point that I am proud of and set myself up for a future that I am excited about. I will be excited to see what I have learned at Iowa State help me in the future as I keep moving forward.