

Cumulative Reflection

My name is Varun Jain, and I am a computer engineering undergraduate student at Iowa State wanting to enter the Digital Chip Design community after graduation. Before coming to Iowa State, I wanted to enter the field of Robotics. To make that dream come through, I took STEM classes in high school, programming courses available online through EdX, and did a shadow program through a Robotics firm.

I had decided the first logical step towards entering Robotics would be to do my undergraduate in Computer Engineering. Thus, once I had decided on Iowa State, I declared my major as Computer Engineering and joined the University Honors Program in the following semester. I also joined the Hindu Yuva and Indian Students' Association to interact with a larger and more diverse community than I generally would have.

Since I had credits or had tested out of courses in my basic program, my first real engineering class was Digital Logic Design (CPR E 2810). Through this course, I learned about the fundamentals of computer design and how more complex problems could be simplified and broken down into basic design blocks. I also learned new tools and a language, which became a stepping stone for future classes.

Taking graduate-level courses was a huge help, as some classes are not traditionally offered to undergraduate students. One was Computational Perception (CPR E 5750), which I took in the spring of my first year. This course was a step toward my dream of being a Robotics Engineer. Learning new tools helped me increase my knowledge base and prepare for what would possibly be a part of my future.

However, things changed when I took Computer Organization and Assembly Level Programming (CPR E 3810). We were thrown face-first into a new language, with only a few weeks to get used to it before we moved on to the projects. Each of the projects required a high time commitment but was equally rewarding. This is where I discovered my passion and potential for Digital Chip Design and shifted my focus from Robotics to more digital hardware-related courses. I found it beneficial to discuss different aspects of my designs with other students and the TAs to get their opinions and create better systems for the complex problems given to us.

At the same time, the course Software Development Practices (COM S 3090) gave me insight into how software was developed in an Agile fashion. We worked in one team on one software project throughout the semester, breaking down tasks within ourselves. This course prepared an excellent foundation for my Senior Design Project, which requires my team to build a website and mobile application to reduce the manual tasks required by our client.

Two more classes, Theoretical Foundations of Computer Engineering (CPR E 3010) and Introduction to the Design and Analysis of Algorithms (COM S 3110), taught me about mathematical proofs and algorithm analysis. These classes will help me in the future with Graph Theory (MATH 3140), which is proof intensive, and my Honors capstone project, which will require me to develop new digital designs to satisfy some device constraints.

Challenging engineering problems are a cornerstone of the Iowa State College of Engineering curriculum, and the opportunity to learn alongside dedicated students and professors has fundamentally transformed my approach to problem-solving. Working through complex issues and collaborating with others has refined my analytical skills and deepened my understanding of digital design. These experiences have also carried over into my internships, where I could directly apply and continuously hone the skills I gained at Iowa State. I am grateful for the solid foundation my time here has provided, and I look forward to contributing to the field of Digital Chip Design with the knowledge and perspective I've gained.