

# Cumulative Reflection

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During my time studying under Iowa State's engineering program, I have been able to develop myself in both professional and personal aspects of my life. The coursework here has taught me many things, going from how to communicate with other professionals to brainstorming and organizing my own complex projects to what seems to be more efficient to me. Courses such as COMS228, CPRE381, ECON101 and even COMS309, among others, played large parts in this.

COMS228 was the programming course in which I started to understand what I was actually doing when programming, where I didn't feel like I had to think much about syntax anymore, and I could start just focusing on how to solve problems programmatically, it all just became natural to me at this point, either being because I had already taken various other programming courses to this point, or the problems were difficult enough to force me to adapt. Either way, during this course is where I discovered that I really enjoyed programming and learned some of the most important aspects to solving problems, the start of learning algorithms and using data structures. This then leads me into COMS311, which I am currently taking at the time of me writing this reflection, a course which focuses heavily on algorithm analysis and development. So far this seems like this course will take my programming to the next level, teaching me to write more efficient algorithms, understand where some algorithms could fall flat, and gain knowledge in some already created algorithms, which could prove useful in various problems that I might need to solve in the future.

Aside from the computer science development aspect, I enjoyed my time taking courses such as CPRE 381 and CPRE 288. These taught me a different way of programming, where I am still trying to solve problems, but in a much lower level than before. I enjoyed working on teams going below the programming languages that we all knew, learning low level languages such as assembly and VHDL, creating our own simulated computer component and programming robots to do proper pathfinding based on what information they can take in from their environment. Even though this is not what I am interested in for the future, I did enjoy exploring this field. Courses like these can be used in future cases when automation would be necessary for some sort of real-world appliance or even much more advanced things like automated military or space exploration projects, where we need to make our machines operate through what data they can take in.

One of the most important things that you could learn in a college environment is project management. You could be the best programmer in the world, but you will get nowhere without proper teamwork and project management skills, your models will not be sustainable, and your workflow will not be efficient without these necessary skills. Courses such as COMS309, COMS437 and CPRE491 are classes that play large parts in teaching project management and teamwork skills, which are key pieces to any job in any field, not only in development, but in any engineering workforce. The only problem with some of these courses is that fact that your grade depends on other students as well, and work distribution will not always be equal.

Even though there a lots of skills Iowa state did give me, there are things that I do wish I had learned to do through course work, instead of me having to go and research many things by myself. The biggest thing that I feel like is missing from the curriculum is a proper front-end development and REST API development classes. Some course gloss over these topics but they never teach proper development techniques for these, and I feel like these are such important skills that all developers with a degree should have. I myself learned these out of need for my own personal projects and internships, but other who haven't taken these steps my fall behind due to the lack of emphasis on this in our current required curriculum.

Finally, I would like to mention the experience that I had during my time in college that had the biggest impact in my development. This would be the various internships and work experiences that I have had throughout these years, thanks to the opportunities that Iowa State has given me. These experiences taught me how companies go about assigning work to developers, keeping up with timelines, communicating with team members and clients, and organizing a proper schedule.