Write about:

* Courses and situations, relating to societal, economic, global, and environmental factors
* Discuss learning to design a system or process, and show ability to solve engineering problems WITH EXAMPLES
* Demonstrate ability to learn independently (go beyond completing an assignment)
* Participates and takes leadership role (TA, solar car, Critical Tinkers)
* Demonstrates responsibility for creating ones own learning opportunities

Plan

1. Introduction
2. School
   1. Create own learning opportunities by going to office hours and help sessions
   2. Go beyond assignments by expanding on them with projects (CPRE 186, EE 201/EE230, CPRE 281)
3. Projects
   1. Critical Tinkers
      1. Autonomous robot arm
   2. Solar Car
4. Leadership
   1. Critical Tinkers
      1. Managing meetings
      2. Holding workshops
   2. Solar Car
      1. Leading projects
      2. Driving the solar car
   3. 281 and 288 TA
      1. Leading labs
      2. Holding office hours
      3. Grading
5. Conclusion

During my time at Iowa State University, I have gained an immeasurable amount of skills, involving how to learn, design, and teach in the engineering field. Between all of my classes, projects, clubs, and jobs, I believe that I have gained many skills through my 4 years as a student at Iowa State studying Electrical Engineering. There have been countless professors, friends, and organizations that have helped further my skills, and I am happy to keep giving back to the community on campus through staying involved in clubs, classes, and activities.

The largest part of my time spent at Iowa State University was in different classes as an Electrical Engineer. During these classes, I would make an effort to try and go to at least one professor’s office hours every week and focus on getting a good grade in that class, which was normally the most difficult one for me at a given semester. Some classes where I took a personal responsibility like this included Calculus 2, Signals and Systems 1, and Computer Organization and Assembly Level Programming. I have seen a great return on both the understanding of the material, and also in developing a strong relationship with my professors that work with me on a weekly basis. I am also satisfied with how I have expanded on the material that I have learned in classes, towards creating my own individual projects. For example, after taking my Digital Logic and first Embedded Systems class, I bought an FPGA board to design my own digital design modules in Verilog, to create my own UART module to send data through a serial cable from my computer to the FPGA board. While I was able to expand on my classes with personal projects, I also learned a lot through the clubs I was involved in at Iowa State also.

On campus, I was involved with two very technical clubs in the college of Engineering at Iowa State, including Critical Tinkers, which I joined my Freshman year, and Solar Car, which I joined my Sophomore year. In Critical Tinkers, I was able to get projects funded and parts provided as long as I could prove I had a solid design and plan to complete it. One project I worked on with the help of Critical Tinkers, with a partner, was to create a fully autonomous robot arm that would flip a switch off after I turned it on. To do this, me and my partner designed an enclosure for the robot, 3D printed parts to make up the robot arm, and a PCB to interface with the Arduino microcontroller. This project was extremely satisfying to complete, and I was very grateful to receive the support I did from Critical Tinkers for funding to complete it. I also worked on multiple projects relating to board design and system integration in the Solar Car club, mainly spending time my Sophomore and Junior years with the team. During this time, I worked on developing hardware to interface with the system of the solar car, including the lights, driver controls, and battery protection system. During this time, I was able to draw the schematic of a board, do the layout, solder the board, test it, and perform verifications when the new hardware was in the solar car. This sort of end to end development was extremely beneficial to me, and it was an amazing experience to share with other groupmates. Both of these clubs helped me learn how to work with and lead a team of engineers, who all come from different specializations and backgrounds. During my time on these clubs, I was able to learn a lot about managing a project and helping students stay involved over the course of a semester.

One of the most important things that I have learned at Iowa State is how to be a leader and an engineer at the same time. Before I came to college, I held some different leadership positions in activities I was involved in for High School, such as band, but I learned that it is somewhat different for engineering. During my time on projects in Critical Tinkers and Solar Car, I had to learn how to effectively convey information in a way that anyone could understand. Since my peers were coming from a wide range of hardware and software backgrounds, I made a very strong point that no matter what you knew before beginning a project with me, there is always room to learn more. Alongside being a leader in clubs, I also enjoyed my time leading labs as a teaching assistant for my Digital Logic and Embedded Systems 1 class. During both of these classes, I helped guide multiple labs of 20 students each on performing their weekly lab material. During this time, I worked very hard to teach students on how to properly debug code that doesn’t work, and how we determined that that process would be effective. It was very gratifying to see my students, grow over the course of a semester, and it made the job worth it every week.

At Iowa State University, I learned a lot about becoming an engineer who can solve problems effectively and think critically, but I also became a much stronger leader through the clubs and classes I taught in. I have seen an amazing return on investment based on all of the time, work, and planning that I have put into college, and I would not change much if I could choose to start over again. I think that my time at Iowa State has set me up amazingly well looking towards graduation and starting full time employment.