Job Summary

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Mechanical Engineering
Corning Incorporated, Summer 2011

My co-op was at Corning Incorporated, located in Corning, NY. Corning Incorporated is a company specializing in glass and ceramics. Corning's products include glass substrates for LCD televisions, computer monitors and laptops, ceramic substrates and filters for mobile emission control systems, optical fiber, cable, hardware and more. Within Corning, I worked in Advanced Modeling and Analysis Department (AMA) in Corning’s Manufacturing Technology and Engineering business segment. The Advanced Modeling and Analysis Department provides modeling and simulation solutions for all Corning businesses.

I have worked on 1 major project during my 2\textsuperscript{nd} term of co-op during summer 2011; Finite Element Analysis of cellular ceramic automotive substrate used in catalytic convertors. I learned how to much ANSYS Classic mechanical software through this project, where I had to create 2D symmetric models of ceramic substrate structures. I used a thermal simulation model developed by an employee of Corning along with the 2D symmetry model to determine the thermo-mechanical stresses produced during the oven shock test. I analyzed several parameters including cell density, web thickness, and oven temperature on thermo-mechanical stressed in oven shock test. Results were used to optimize test procedures.

When I started my 2\textsuperscript{nd}-term of my co-op, I did not have to re-do any orientation other than getting re-activated since I have already finished the orientation during the first term. The same as the first term of co-op, I stayed in Ithaca and carpooled with 5 Corning employees. It is about 1 hour drive each way, but since my lease for senior year started in the beginning of June, it made more sense to me to live in Ithaca and commute rather than...
finding a place in Corning and a sub-letter for the apartment in Ithaca. It was my 3rd time living in Ithaca during the summer so nothing was new, but it was nice as every summer 😊.

Worst feature of this job was waking up at 6 in the morning to go to work. Since I carpooled, I needed to wake up at 6am and get ready to leave Ithaca by 7am. Since it was summer and not many people around, going to sleep early was not a problem.

Best feature of this job was learning new things and using what I have learned in class in solving real life problems. In school, we don't really get a chance to learn how to use software programs, which are widely used in the industry. Therefore, the chance to learn ANSYS Classic mechanical software was very valuable to me. It is something that I can tell my potential employer for full-time position that I have an exposure to the software. Also, it was very nice to apply what I learned in class in solving real-life problems and be able to understand what is going on.
Coop Work Assignment

Advanced modeling and analysis provides modeling tools and fundamental understanding to a wide range of businesses within Corning, Inc. The group operates with the manufacturing technology and engineering division, under the broad category of science and technology. It is primarily a research-oriented group with projects throughout everything from display technologies to environmental technologies.

As a coop in the group, I worked on modeling efforts to simulate the flow of batch material through extrusion dies for the creation of ceramic substrates used in catalytic converters. I worked in the programs Gambit and Polyflow, along with extensive data analysis in Microsoft Excel. I was trained in the software on the job, and introduced to the company through a series of orientation videos and activities. My supervisor was my main contact for questions.

Assessment of Learning and Development

The work I participated in was directly related to my coursework in fluid mechanics and mass and heat transfer. Modeling software drew on my background in computer software including some computer programming. The group demographic was primarily foreign nationals with doctorates, which provided a unique learning experience and opportunity for advice. The work term introduced the idea of an engineering project to me, and helped me to understand the role of a professional and the relationship with coworkers.

Conversations about graduate studies assisted in my decision of whether or not to continue after my bachelor's degree. Participating in evaluations and development initiatives gave me a sense for what a business looks like, and what my future role there might be. In the next term, I expect to be more involved with the direction of the modeling; making decisions about appropriate parameters to include and areas to focus on.

Life Out-side of Coop

Corning, NY is not far from Ithaca, which allows for the option to commute. I personally stayed in an extended stay hotel which was subsidized heavily by Corning. There are apartments available in the area, but limited leases may be difficult to obtain. A car is a must.

Although the social possibilities in Corning are limited, the proximity to Ithaca allows for plenty of social opportunities on the weekends. I was driving back every weekend, and able to attend concerts and events at Cornell whenever was best. Again, a car is a must. Corning has wonderful community service initiatives, as the town is a company town. I participated as a volunteer coach for Jr. First Lego® League, and was a member of both the construction and design teams for the Food Bank Canstruction competition held in October. There is a local YMCA with athletic facilities.
Job Summary

A. Co-op Work Assignment

Advanced Modeling and Analysis (AMA) is within Manufacturing Technology and Engineering (MT&E) and serves as a corporate internal consulting group for Corning, Inc. The group focuses on projects in development or manufacturing that require a deeper understanding of the underlying physics. My projects in AMA were working on technologies in Corning’s Environmental Technology (CET) business. CET produces ceramic substrates used in catalytic converters. I was working on the manufacturing technology required to produce a newly designed product that required the use of computational fluid dynamics (CFD) to explore an extrusion process. Upon receiving my projects, I was given training materials for software packages used by Corning, and worked closely with my supervisor to understand the problems presented and the tools available to me.

B. Assessment of Learning and Development

At Corning, I used my background in chemical engineering to understand fluid dynamics problems. I needed the math and logic skills afforded to me by my engineering education. The topics involved in my job were not directly covered in classes, but many of the same concepts applied. Moving forward, I will make use of many of the software packages that I learned at Corning, and will make more informed decisions as to whether or not to pursue further education. I have a much better understanding of my interests
within engineering and my opinion of graduate education, and during my time here my communication skills have greatly improved. I feel very comfortable writing technical reports and giving technical presentations.

C. Life Out-side of Coop

Corning is a small town, and housing can be tough to find. If you have a car, there are plenty of towns near corning that may offer housing. Try to find an individual renting a room, or a small apartment, because the apartment complexes do not offer short term leases. The company’s proximity to Cornell means that you can also live in Ithaca if you are willing to commute an hour each direction. You will need a car at Corning. Socializing is fairly easy, as you will be within an hour of Cornell. Take advantage of the free time that Coop affords, and explore Upstate New York.

D. Evaluation

Working for AMA in Corning provides a unique opportunity to explore all of Corning Inc.’s businesses. As a corporate engineering group, AMA sees everything from life sciences to display technology, and the employees are always willing to share what they are working on. The work is interesting, and I was given meaningful assignments with bearing to current products and initiatives within Corning. Be cautious of the freedom that Corning provides; you are trusted to perform you job, and nobody looks over your shoulder to make sure you’re getting your work done.
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Summer 2011

Co-op Work Assignment

Prior to my second work term at Corning, I came to the realization that I was more interested in the business aspects of technology than the engineering aspect. I reached out to my supervisor from my previous semester and spoke to him about getting a business analyst position for my second work term. He was able to speak with another manager in the Life Sciences division at Corning and set up what was essentially an internal consultant role. I also continued some of my work from the previous semester so I ended up working both as a development engineer and an internal consultant on two different projects.

The work I did as a development engineer is very similar to the work I did in my previous work term (already documented in my previous job summary) so I’ll focus only on my role as an internal consultant. The project in which I was worked as an internal consultant was called Synthemax. This team was producing a completely synthetic substrate on which to grow stem cells. I was really excited to work with this group because they were selling this substrate to a stem cell therapy company that was on the cutting edge of the field. Our client was the first company in the US to get FDA approval to work on stem cell therapies and the rest of the stem cell industry in the US would be heavily influenced by the success or failure of our client. In any case, my specific role was to create cost models and develop a value proposition for the product we were selling by comparing value we created versus our competitors.

I researched several scientific papers, went through FDA documents and spoke to several clients and Corning scientists to gather data. There was an overwhelming amount of data to process and my background in molecular biology helped me decide what was important and quickly understand any relevant information.

The work I did here was unlike any engineering work I’d done. It wasn’t easy to get necessary data – I often had to get information from my models from direct competitors. Dealing with these situations required creative approaches and helped me develop my interpersonal skills. Sometimes I got conflicting reports from people; in these situations, I would have to apply scientific reasoning methods to sort through what both parties said and get to the facts.

Working on two completely different projects was also very difficult. I had to be very good about time management to deliver on all fronts and there were definitely some times when I was a little behind but my supervisors understood that I was working as fast as I could.

My supervisors and other people in my group were always willing to help me with any questions. Corning encourages 1:1 meetings with different members of your group when you first join, and I made good use of this training plan. Occasionally it was difficult to get in touch with some people because they had left the project a while back, but this did not happen often.
Assessment of Learning and Development

Consulting positions do not require very specific skill sets. You do not need to know how to operate any tools or use any software. But you’re expected to be able to think critically and have good communication skills.

My interpersonal skills were greatly strengthened during my work experience. I often had to interview people to get necessary information, and in doing so, dealt with a wide range of personalities. I had to act differently in each situation. When interviewing senior scientists, I had to ask very direct questions and keep the interview as short as possible to make the best use of their limited time. When I spoke with technicians, I had to be prepared for them to spend some time discussing their experiences on the job before actually providing me useful information. Through these interviews, I learned how to subtly steer people towards answering the question I’d asked them as efficiently as possible.

Another crucial skill I worked on was data gathering. I had to sort through lots of information to get to data that was actually useful. Sometimes it would take days of research to find one useful number. It is extremely important to plan how you conduct your research and how you decide what is important.

My working environment was very individualized. It was just me and my supervisor. I would have appreciated the chance to work with a team but the nature of my work meant that I was mostly working on my own. However, the experience taught me to trust myself and be self-sufficient.

Life Outside of Co-op

My social experience this work term was very different from my first work term because I chose to stay in Corning over the summer. Although I’d initially been under the impression that I would get incredibly bored at Corning, this quickly changed when I found out that there were over 100 interns over the summer. We were given subsidized housing and interns were spread out over several hotels and inns, with about 10 interns per location. The interns at each hotel developed good relationships with each other and we often met with each other after work. We would eat together at one of the inns at least once a week, and we occasionally watched a movie together. Corning also offer good deals on gym membership and runs a softball league that many of the interns participated in.

Towards the end of the semester, I started coming to Ithaca over the weekends and I occasionally brought some of my Corning interns with me. Showing them around campus was interesting and I ended up doing some things I hadn’t done before, like going up the clocktower.

It was very easy to get along with the interns and my co-workers. The people I worked with were extremely helpful and friendly. All my supervisors had a good sense of humor, were easy to talk to and were willing to discuss my career development with me.
Evaluation

I had never worked in a consulting position before and had no idea what to expect. During the summer, I was given real responsibility and worked on several skills that aren’t frequently used in pure engineering jobs. However I really enjoyed it and eventually realized that consulting was the industry I wanted to work in after graduation.

One major issue for me was the amount of work I had. Perhaps I had been too ambitious at the beginning of my work term, but I found it very difficult to handle two completely different projects at the same time. It takes experience to be able to multitask at that level.

A second issue was the distinction between interns and co-ops at Corning. I found it very strange that Corning makes this distinction since we essentially have the same job function. Even stranger was the fact that co-op students had fewer privileges than interns.

To summarize, over the course of the summer, I realized that consulting would be an excellent fit for me. I challenged assumptions made by the management on my project and was able to uncover surprising results that had a real impact on the project. The people I worked with, both full-time and interns were very easy to get along with and I am still in touch with some of them.

Additional Info

- Corning offers good discounts on a lot of its products to employees.
- The food at the cafeteria is both healthy and reasonably tasty. Since it’s subsidized by Corning, you will get better deals than in Ithaca.