Coop Assignment Summary: Fall '07 at GE energy

Work Assignment

This fall, I worked under the Wind Energy “Direct Material Productivity” team at Schenectady, NY. My group was in charge of developing and carrying on engineering design changes that would reduce the cost of engineering components that make up a wind turbine. The main task of my group was to take those already existing engineering design and then come up with a new idea to reduce cost (value engineering) and then make sure to integrate all parties involved: designers, suppliers, sourcing & logistic leaders, as well as field engineers so that the new low-cost design would be implemented (project engineering). This is a vital part to the Renewables business (wind, solar, etc), whose success depends on lowering 'the turbine cost to power output' ratio. At this moment, GE Wind’s 1.5MW turbines are well spread through the world, but the new state of the art 2.5MW turbine has already come out in the market and thus, as a new product in the industry, it was our major cost-out target.

As a coop, I was involved with value engineering, and also with project engineering to some extent. I worked on a couple of major projects as well as minor projects. My projects consisted on either coming up with an idea to reduce the cost of a particular turbine component, or build from someone else’s idea, and then work with suppliers, sourcing leaders and the engineer designer responsible for the relevant component. Once the idea was well crafted, I was in charge of putting up a presentation for the chief engineer approval. When a project was “approved”, it went through a series of Toll-Gates prior to implementation, where a project engineer from our team took care of the leading it. From there on, I acted as support of the project engineer, from whom I learned a great deal about leadership. I was responsible for 10 projects that ranged from lowering the pressure requirement of grease fittings to standardizing our sensors, 6 that resulted in large cost savings. My largest project was to re-design the cooling system used in the 2.5MW turbines. For this particular project, I used my knowledge of materials and system engineering, and finally was able to come up with three possible solutions that would have reduced the cost by almost 1 million Dollars.

The training I received was minimal, as this job was about applying your engineering skills as well as communication skills needed to interact with U.S. suppliers, German design engineers, as well as project engineers from Beijing. The first weeks I learned through carefully shadowing my teammates and attending cross-functional business meetings. When I had technical questions, I generally approached my technical leader, and when I had procedural questions (When to take a day off, GE policies, etc), I approached my H.R. representative.

Learning and developing

My work was mostly the application of material science, mechanical and systems engineering on real-life engineering problems, and a strong business sense as well as communication skills. As an electrical & computer engineer (ECE), I encountered many technical problems that were more challenging than I expected due to my purely electrical background, but now I have added breadth to my curriculum. This has given me the opportunity to see why a degree is needed and to what extent. Classes seem all the more worthwhile now that I understand that yes, you may not end up applying
Gauss law for your next on-the-job challenge, but it is invaluable to have a good notion of how that law came about and what implications it may have in solving your next problem.

However, above all, this position gave me a good sense of my career development direction. I have finally realized that I will pursue a MBA instead of a MSEE. I now know that one of my goals will be general management in the technology industry. General Electric is company where a good business sense is imperative, and I clearly see how a MBA complements my technical degree in Electrical Engineering. This position has given me some critical leadership skills, as I led projects into their implementation. It has given me a strong personal growth, as now I feel more able to command, more confident of myself and ready to take action when needed. The only thing I regret is not having taking the initiative to direct more projects during my first month, where I spent most of my time learning the 'how-to's of the job.

Life outside the Office

This fall, I stayed in the first floor of a house of one GE employee, who lived with his family on the second floor. I found this particular housing through the help of the GE HR people who forwarded me the information of GE employees with available housing and near-by apartment complexes. The house was rather large, spacious and affordable but the room was unfurnished, so I ended up getting creative to organize my room, although I end up sleeping on an air mattress for the most part. Housing-wise, I recommend setting your priorities: apartment complexes are furnished and very nice but they are upwards of $800/month, while unfurnished houses are usually $400-$600. I recommend looking in Craigslist about 2 months prior to arrival and asking for GE HR “housing information”, and making a decision based on what life style you are aiming at. Also, I chose to live close by the GE campus, close by Union College, where as some others decided to get nicer apartments farther away and thus commute to work (30 minutes hour drive).

In Schenectady, NY, public transportation is very limited, thus most people drive a car, although I got away by getting a ride from my landlord to and from work, and rides from my coop friends for social occasions. This fall, there were about 20 coops at Schenectady, NY, 10 of which were usually around for social occasions. My usual week consisted on going out with my fellow coops three times per week, with the remaining of the days spent reading a book, watching online movies or even learning how to cook. Our activities consisted on watching movies, going out to eat, soccer games, and nights at the Albany mall. However, although GE’s HR sometimes offered us help to organize our own social events, it was mostly out of our own initiative as there was no set social coop program. My recommendation for any future coop would be to beware that it takes one’s initiative to participate in these social events and it is easy to end up isolated from the group, as was the case with many coops that never participated in our activities.

Evaluation and Additional Info

In all, it was a very positive and rewarding experience. General Electric is a very friendly company and I had the luck to meet great people from whom I learn a great deal, whether it was about leadership or integrity. As I said, schooling now looks different in my eyes: it all makes sense and ties up
with my studies, even if I put it in practice barely any of my electrical engineering knowledge this semester. The best part of my job was slowly becoming friends with those people I led, as it felt much more rewarding. Also, having the opportunity to see all of my ideas put in practice was a priceless feeling. However, the challenges I went through to learn effective ways to perform my job, including proper technical communication and understanding cultural differences, were considerably large. For those future GE energy coops at Schenectady, I would like to tell you two tips: first, GE is a great company that you will come to admire, and second, Schenectady can look unfriendly at night-time but don’t let that stop you from having a good (and safe) social life.
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Fall 2007

Work Assignment

As a co-op at GE Energy in Schenectady, I worked with the Plant & Accessory Systems Department. The department, on the whole, works on the parts of the gas and steam turbines that are not part of the actual turbine. This can range from lube oil systems to insulation and acoustic barriers. The Plant & Accessory Systems Department is a component of GE Energy, which in turn falls under GE Infrastructure. GE Infrastructure is one of General Electric's major businesses along with GE Money, GE Healthcare, etc.

All of the assignments that I received as a co-op were tasks that would have been given to other engineers if I had not been there. The majority of my work focused on crisis management, analysis and design. The first major project that I was given involved a review of all field welds on units that had already been built to make sure that the materials being welded were compatible. A unit that had unexpectedly failed due to two materials being incorrectly matched motivated this review. This task took over a month to complete because it involved a very detailed and thorough check of hundreds of turbines.

Another major assignment that I had the opportunity to work on involved the Lube Oil System in the steam turbines. I worked with an engineer on the team to create a flow model of the system so that it could be employed for any unit by just plugging in the known conditions. In order to do this, the engineer and I went through and collected relevant data and then collaborated with one of GE's teams in India to create the actual computer model.

In addition to crisis management and analysis, I got to work on a more design-oriented project for the Hydraulic Piping System. I was asked to create the hydraulic piping schematic for a new steam turbine by comparing the piping and fitting sizes on valve actuators from similar jobs that had already been completed. This involved looking up information on the new job and comparing it to the information from the old job. Then, based on any differences that I found, I would mark-up a new drawing and add in any necessary parts that needed to be ordered. These mark-ups then were sent to the Drafting team to be officially issued as a bill of materials (BOM).

There were several other assignments that I got over the course of my term at GE. All of them were in the same department, however I was constantly working with different engineers. This made the job more interesting because I had the opportunity to work with many different people. Everyone who I worked with was very helpful and went out of his/her way to offer explanations and assistance. They were more than willing to answer any questions I had. There were also some people who took the time to show me and the other co-op in my department the buildings on GE's campus where steam turbines and generators are assembled and manufactured. This helped a lot because I could actually visualize what I was working on. In addition, I had the opportunity to go to a power plant where a GE steam turbine, gas turbine and generator are actually running and see one fully installed. I also was able to visit GE's Global Research Center and see the innovative research going on there. This research included the development of a handheld product called StreetLab that is sold to customs offices and police stations to determine
the content of suspicious substances. I also got to see the lab where they test and observe different human tissues looking for markers of cancer.

Learning & Development

The work that I did at GE is directly related to my major, mechanical engineering. I got valuable experience in a technical engineering career. This opportunity definitely furthered my career development because prior to co-op, I did not have a clear idea of what an engineering position would entail. I’ve realized that power generation is not necessarily the industry I intend to pursue upon graduation. However, I do see it as a great option to have because of the exponential growth in the near future.

I have also concluded that I would like to continue my education after I graduate. I haven’t decided upon a specific type of graduate school, however I believe that I would like to stay in school longer rather than starting to work immediately.

Overall, this has been a worthwhile experience for me because it has provided me with the chance to try out an engineering job temporarily and get a better sense of what I would like to do in the future. If I had not done co-op, I would have come to similar realizations after graduation, but my commitments would be more long term.

Life Outside of Co-op

For housing, I found a three-month (short term) lease at an apartment complex on the border of Schenectady and Niskayuna. It was slightly more expensive because I rented a furnished studio apartment, however it made the moving process much easier. If possible, I would have loved to live with other co-ops because I think that it would have been more fun, but I was unable to get a list of the co-ops prior to starting. If I were to do it over, I think that I would make sure to send some sort of email through HR to find other co-ops to live with.

GE does not provide any housing, however they give you a $600/month stipend. Also, in Schenectady, it is difficult to manage without a car.

Socially, GE is great because even during the fall, there are over 20 co-ops. This makes it easy to go out to lunch or hang out at night. During this semester, there were lots of co-op activities including movies, concerts, Halloween parties, etc.

GE has lots of volunteer activities. I got to go to a 4th grade classroom on Tuesdays and help lead science experiments, which were a lot of fun.

Evaluation

The best feature of this job was definitely the people. I liked all of the members of the team I was working with and that made the entire experience a lot better. It also made a huge difference that there was another co-op in my department. We were able to work on projects together which made the work more interesting. I also really liked being able to get a taste of full-time work with the knowledge that I was still heading back to school next semester. This made it easier to get the most out of the experience.

The worst part of co-op is that as a student, no matter how great an experience is, you are working instead of being in college. This is a sacrifice that is worth making if you think that having real working experience is worth missing a semester at school. For me, I think that it was worthwhile. I was able to go back and visit Cornell on several weekends which was also great because it's really nice not having to worry about tests and problem sets for a couple of months.
All in all, I enjoyed the experience and would recommend GE Energy to any prospective co-op.
Co-op Job Summary

I joined the Systems Reliability Engineering (SRE) team during my Fall 2007 co-op term. This team fulfills a support role for design engineers by assisting in the design for reliability (DFR) process. The goal of this process is to have designs meet or exceed specifications for product reliability. The team often employs modeling programs such as Blocksim or SPAR to assist such analyses. Since it functions in a support role, the team engages a variety of programs. During my rotation I worked on five different projects: analysis of an inlet chilling system, analysis of a fuel line purge system, an effort to refine a coal gasification plant model, an effort to provide reliability information for wind turbine design guideline documents, and an effort to create an SRE training manual for the use of Blocksim.

GE provides generic training through on-line tutorials. My SRE-specific training consisted of discussions with team members and study of documents. My manager assigned a team member as my “buddy”; I often approached this person with questions. The entire team, however, was supportive and friendly throughout my rotation. This created a comfortable working environment, which I find it to be the best aspect of my co-op experience. I also enjoyed the opportunity to witness GE’s renewable energy work first-hand.

Although my role required an engineering background, it did not relate to my mechanical engineering coursework directly; for the most part, I exercised statistics and
knowledge of failure analysis. Nevertheless, I believe that my experience in systems reliability engineering will be a great asset to a career in Aerospace Engineering, which I plan to pursue. I spent a great deal of time analyzing complex energy systems for reliability issues; this employed analytical skills and fundamental knowledge crucial to an engineering discipline. Furthermore, I am sure that reliability is a key concern in the design of aerospace systems.

Through my rotation with the SRE team, I better understand the breadth of Engineering. It has enhanced my knowledge of the detail, variety, and long-term nature of engineering efforts. I learned that professional culture is hierarchical and focused, yet gregarious as well. The role has also bolstered my confidence and my ability to work with others in a pro-active yet assertive manner. In these ways I feel that my position as an intern has enabled me to function effectively and enjoyably in a workplace setting.

For those who will consider working at GE Power Systems in Schenectady, I suggest searching for housing early. It may be best to share an apartment with a friend in order to keep costs low. It is most convenient to have a car for personal use, although it is possible to walk from some housing. The interns here often organize social activities, and the campus has a variety of sports fields. Employees sometimes organize teams to play games. GE also highly encourages community service; service opportunities may be identified through a web portal or through announcements.

In summary, working with the SRE team has been a great privilege. The least appealing aspect of the job was its non-technical nature. The greatest features, however, were a supportive, kind team and the opportunity to see a variety of programs in Energy.
I believe that this experience has better positioned me to succeed in the corporate engineering world.
Engineering Co-op Term One at General Electric Energy

Colin Riley
Chemical Eng '09

This fall, I had the opportunity to become an engineering co-op at GE Energy's facility in Schenectady, NY. I worked as a member of the Plant Systems Analysis team, a subdivision of the Plant and Accessories division of Thermal Systems and Power Plant Engineering. The Plant System Analysis team "provide[s] an overall understanding of plant system behavior, including interactions among sub-systems. This is accomplished through intensive analysis with mathematical models which are used to form a detailed plant system level view" (taken from PSA website). The PSA team works with conventional gas turbine, steam turbine and combined cycle power plants, as well as syngas power plant technology in several applications.

As a member of the PSA team this fall, most of my projects dealt with syngas technology power plants, with one assignment analyzing test data from a moisturizer column used in conventional power plant applications. As the mission statement of my team implies, all of the work I performed fell within the realm of mathematical modeling. I utilized programs such as Aspen HYSYS, GTP Gas Turbine Performance Simulator, and Microsoft Excel to create and analyze these models.

Most of my co-op term can be separated into three overarching projects. In the first, which I already briefly mentioned, I verified, compared, and reconciled the data collected from a simulated 7H fuel gas moisturizer column environment in Aspen HYSYS with field test data collected from the actual column modeled. A significant moisture content error in the HYSYS model was observed when compared to actual test data and I presented an accounting for this error, as well as solutions to avoid the error in the future.

Separately, I rectified the difference between GE Oil & Gas fuel gas compressor data and data values calculated by PSA through an Excel-based compressor calculator tool. I accomplished this by modifying the compressor calculator tool to more closely follow the thermodynamic calculations performed by Oil & Gas.

In my third project, I worked closely with a team member to analyze the performance of GE's 9FB gas turbine over a range of different fuel gas compositions currently available. This involved using GTP, carbon capture technology theory, and properties of gases to create a comparison that helps in the selection of gasifier technology for different turbine applications.

Beyond these three projects, I performed other tasks to help the PSA team inside the area of gas turbine analysis. This included the testing and debugging of a gas properties Excel add-in, working with the thermodynamic relationships and performance curves of different fuel gas compressors, and creating specific gas turbine performance points. I also reviewed the team's New Employee Handbook, removing and replacing irrelevant information.

Most training for my work was provided through instructional sessions with coworkers, as well as experience through experimentation with the software required. Attempting to work directly with the data often proved the most effective way for me to learn a new analysis technique, especially when questions were easily answered through coworker guidance and select printed materials. While I didn't have an assigned mentor at GE, a few key members of my team were recommended by my supervisor to advise me on specific projects and were always very helpful and effective at answering questions.
In recent months, my career interests have been focused on the energy industry, although not any specific part. From that perspective, I feel that this co-op term has been incredibly educational, bringing to light a piece of the energy industry I hadn’t fully considered: the modeling and design necessary to implement an already-existing technology into different environments. Every bit as crucial as research, manufacturing, and maintenance, modeling offers an interesting blend of theory and practicality that is hard to find in most engineering positions. And even though many of my team members were not chemical engineers, thermodynamic issues and heat and mass transfer problems were prevalent enough to make it very relevant to my major. In fact, I’d actually say that this work corresponded almost perfectly to the classes I have taken so far and served as a great introduction to the process control classes I will be taking in the coming calendar year.

But, as should be expected, my experience this fall educated me in more than just subject matter. Being a co-op at GE has helped me understand the daunting differences between college and the working world. More than just getting up earlier and having (almost) no homework, working as an engineer at GE requires an entirely new work ethic. Granted, deadlines and presentations still exist just as much as they do at Cornell. But rather than a hurried panic to study for a test or complete a homework assignment on time, the professional world requires a steady driven pace at all times to finish quality projects in a punctual manner.

Getting a problem “wrong” also has an entirely new meaning. Since equations, definitions, and properties are all constantly available, double-checking work is usually enough to guarantee that any math is correct. The real test of knowledge and ability manifests itself in finding ways to solve the problems, followed by the analysis and explanation of results. While important in many classes, all too often college work becomes formulaic, with only one way to get the right answer solely through excessive number-crunching. I found, again, that professional engineering requires a different approach to work than seen in college life, grounded heavily in quality rather than quantity.

More than anything, however, I feel this term of co-op instilled in me a self-reliance unlike that experienced at Cornell. And not only in the workplace. While I needed to actively pursue contacts and other team members to obtain information vital to the completion of my projects, I found self-reliance to be an integral part of my entire life situation this fall. For the first time in my life, I had to go grocery shopping, cook my own meals, and take active responsibility in performing daily chores. I managed bills and cable installations, maintained a budget, and found an apartment without assistance. While not impressive accomplishments in their own right, they taught me truths about life you can only learn from experience. After being almost fully self-sufficient for four months, I have much more self-confidence and practical life knowledge than ever before.

And it is within the subject of practical life knowledge that I feel I made the most mistakes. Unfortunately, I waited slightly too long to procure an apartment for the fall (mid-July), so my options were severely limited. I ended up getting a mediocre slightly overpriced apartment that was significantly distant from the GE plant. There are a large number of apartment complexes within a fairly tight radius around the facility, although a car is necessary for any location. If I were to have started searching sooner, I could have saved both money and a large amount of time that I spent commuting.

The large number of engineering co-ops at GE Energy’s site in Schenectady, from Cornell and other schools, naturally created a plethora of great social opportunities. GE’s EID program even helped create social events by sponsoring two social chairs, charged with
organizing and publicizing co-op lunches, parties, and trips. The Albany/Schenectady area may not be the most exciting social scene in the country, but our social chairs this fall never failed to find something new and interesting every week of the term. Yet even given all those chances, I still often found myself choosing to spend an evening at home instead of out with fellow engineering co-ops. If I were to relive this fall, I would probably spend much more of my free time socializing, especially since it would be so easy to do so. Not only that, but I would probably get involved in the community service program GE offered to all co-ops in September, in which engineering co-ops travel to school classrooms to teach science lessons. Looking back it seems like a fun opportunity I shouldn’t have rejected.

Despite these minor regrets, I am very pleased with the outcome of my first term at General Electric Energy. It’s always hard to pick “best” or “worst” features of a life situation, even more so when every almost aspect is positive. Perhaps what impressed me most was my quick integration into the structure of the team. I feel my projects were sufficiently educational, yet at the same time within the scope of my learning and experience. I was also happy with the number of opportunities GE offered to see power plants, tour manufacturing facilities, and hear guest speakers. That is undoubtedly one of the advantages of participating in co-op through a large corporation. That being said, I feel one of the greatest disadvantages of working for a company like GE is the necessarily limited scope of any assignment. While practical for GE to have several teams working in mathematical modeling, given the large amount of work such teams have, I’m also interested in seeing other levels of the energy industry that I may have experienced at a smaller company. But even so, I’m very glad I chose to become a GE employee and I look forward to future work possibilities within the organization.
This fall I worked in the Ventilation and Heat Transfer group of the Generator Systems Design and NPI\(^1\) group at General Electric in Schenectady, NY. The Ventilation and Heat Transfer (V&HT) group works on the cooling of generators made for turbines. The V&HT group has a technical engineering role within the rest of the GE Energy. During my term in the V&HT group I worked on one major project and helped with other projects. The main project I worked on was developing a physics based model for generator coolers. I also worked on a pressure drop study for the cooling liquid of generator coolers and participated in a generator factory test.

My major project of developing a generator cooler model was a complex process of applying knowledge obtained in classes along with information conveyed from my supervisor about generators. There was limited training with respect to my main project. The programs that I used to help develop the model were reviewed before and during use by my supervisor. When there was something I was unsure about, my supervisor was very approachable and helpful. My supervisor directed me in my work and resided in the cubical attached to my own. Training for the factor test was presented in a meeting style to review safety and testing protocol. I had a limited role in the factor test because of my inexperience, but participating was very helpful in understanding the generator as a whole.

My work at GE and the V&HT group did not originally line up with my career goals, but has proven to be a very interesting area that I would enjoy continuing. My

\(^1\) NPI: New Product Introduction
work correctly reflected my educational background at Cornell. Taking heat transfer
during the summer semester before this term of my coop was an extreme benefit because
I understood the theory behind the coolers which made creating the model much easier.

During this term in the V&HT group I was exposed to professional engineering
and professional culture. From this exposure I learned that engineers are not limited by
their knowledge but by the time to work on projects. The professionals that I worked with
were extremely helpful in all aspects while I worked with them, and were very open to
me exposing myself to other aspects of GE while working in the V&HT group. I learned
that engineering culture is not to sit and do one thing while other projects pass by, but to
learn about as much as possible while still completing your primary tasks and helping
others in your area of expertise.

This position also influenced my professional and personal development. I was
exposed to people of many different backgrounds, personal and educational, all working
together to accomplish a common goal. This cooperation between majors and
backgrounds is not portrayed at Cornell through classes because you are usually limited
to working with people with the same educational background. However, at GE I was
exposed to a mix of professionals with different majors who all contributed positively.

If I was going to go through the same experience again I would not change much.
My experience at GE was great and I really enjoyed going to work. The only change that
I would like to make on a re-run would be to try to get to know people more. I am rather
reserved when I meet new people and I would have really liked to try to get a little more
involved in more projects.
Finding housing in the Schenectady area was not extremely difficult if you have a car. I am living approximately 15-25min from GE campus, depending on traffic. Nice housing closer to campus is a little harder to find, but GE does have a helpful housing suggestions list with phone numbers. Life outside of work was much less eventful than life at Cornell. Activities outside of work in the Albany area mostly consisted of hanging out with fellow coops. There are usually a lot of coops at GE, which a great benefit because then there is usually always someone around to do something with. Some activities that I participated in during this term were a Trans-Siberian Orchestra concert, GE Day at Proctors, and endless movie and game nights with fellow coops. I also participated in Junior Achievement which I got involved in through a GE Lunch and Learn. Junior Achievement is a program where professionals go back to the classroom and participate in activities with students, 7th graders in my case, to help show the benefits of staying in school and making good decisions.

The best features of my job at GE Energy this fall was definitely the independence and the ability to work on a project that I was responsible for. I had direction, but the layout and actual programming of the model was in my hands. I was not left to do everything myself because I am still learning, but I was given the freedom to work and think as an engineer in a technical atmosphere.

The worst feature of my job at GE Energy this fall is that I am not able to continue working. I wholly enjoyed my coop at GE and the V&HT group and enjoyed having ownership of a project while being able to participate in a generator factory test and helping on other projects.
During my first co-op term at GE Energy, I worked on the design automation team on gas and steam turbine accessory systems. Our team’s job was to support the design engineers to help automate the process used to make customer drawings for the accessory systems. During my time here, I split my time between doing the normal, day-to-day duties of the engineers in my group, and working on projects designed to investigate possible improvements to the process. I feel that because of this, I got an excellent understanding of the whole process.

The team that I worked with in Schenectady was a very small and young (all twenties) team, and because of that, I got to know each person well and would approach anyone when I had questions. There was no definite mentor assigned, but I received tasks from just about everyone. There was never really a time where I did not have anything to work on beyond the first week or two because early on in my co-op, I was given several long-term projects that I would be working on throughout.

One definite comment that I would have is that very little of the actual technical mechanical engineering curriculum went into the work that I did here. These technical skills provided a background that made it easier to understand what I was doing here. However, I feel like I would have been technically able to do the jobs that I was working on when I was in sixth grade. Instead, my organizational and written and verbal communication skills were what helped me the most in my work here, and these were also the skills that were developed the most.

I think that my work at GE gave me a great idea of the professional culture of a company of this size. The ease of communication with any of the thousands of workers in any of GE’s divisions was quite amazing. I think it was also a good experience because I was able to adjust to the speed at which things move in the business world, which is quite a bit faster than the world at Cornell. Major ideas that we were discussing on a Monday would often be approved and implemented by the end of the week. Also, the attitude that I gained of continuous process improvement and the refusal to be satisfied with the status quo will be very valuable to me for the duration of my career.

I felt that the co-op program at GE was very unorganized. We were not provided with housing (beyond a housing stipend) or much in the way of help in finding it. I found my apartment on Craig’s List, and I think that this is probably the most effective method of finding short-term housing in Schenectady. I would recommend living as close to the plant as possible (in Schenectady probably), because traffic can be pretty bad during rush hour. Additionally, GE did not really organize any social activities for us. We did organize things ourselves, but we had no budget to work with. However, I think that the job is the most important thing, and anyone who is interested and gas turbine accessory system (much as I am) should not be turned off by the lack of organized social activities. Just organize something on your own.
Overall, I had a mediocre time at GE Energy. However, due to the size of the co op program in Schenectady, there is a great variety of experiences to be had there, and I know both people who hated it and people that loved it. I think that the job that I was doing at GE is one that I absolutely, one hundred percent, would never want to do again, but that is not to say that I did not learn anything because I think that I both learned and grew a lot. It is an experience that I am glad I had (and not only because I learned what I do not want to do).
Gasification is an old technology that has recently garnered a lot of attention because it can harness energy from the vast amount of coal in the US and abroad. Gasification is the process of applying heat and pressure to organic materials, in this case coal, and harvesting a mixture of carbon monoxide and hydrogen called syngas. This syngas can then be put through a traditional gas turbine to produce energy.

One of General Electric's main subdivisions is Infrastructure. The Energy Division is part of Infrastructure, and Gasification is a part of Energy. I was on the process design team within Gasification. GE has a contract for a gasification plant in Indiana. The plant is divided into "subsystems" based on the order and function of the equipment. My mentor was in charge of an area that major equipments including the radiant syngas cooler, the slag crusher, and a high-pressure steam drum.

My main task was the Critical Component Review (CCR) for the Slag Crusher. A Critical Component Review is simply a review required for all components deemed to be critical to operation of the gasification plant. The slag crusher is one such equipment. Slag is the left over gunk from heating the coal under high pressure. The Slag Crusher takes slag and crushes it up prior to disposal.

Basically I was executing a thorough consistency check on the Slag Crusher to make sure that all the Slag Crusher parts would fit together, and that the unit would tie into the rest of the plant correctly. This meant reviewing about 80 technical drawings and many pages of specifications. I would mark down inconsistencies, mistakes, and clarifications and they would be sent back to the vendor for review. After several iterations of this process, we have recently received final revisions of many of the drawings and have sent them to the original customer.

Many of the documents I reviewed are standard documents that exist in the engineering phase of any chemical plant. I reviewed Purchase Order Specifications (PO Spec) that mentioned exactly GE wanted from a vendor. There were Process Data Sheets (PDS) that detailed all process information pertaining to an equipment. The Basic
Engineering Design Data (BEDD Document) outlined all plant utilities available and geographical conditions. I also worked with Piping and Instrumentation Diagrams (P&ID) that illustrate the fine details of the equipment including connection sizes and controls. Utilizing all these documents and other data, I made checklist for the CCR review. Learning how to use all these different types of documents is a requirement for many chemical engineering jobs and is a valuable skill to acquire.

Even outside of the technical realm, I learned a lot about the work world during my stay. For example, prior to this work experience, I underestimated the amount of communication necessary in an engineering job. The Slag Crusher was contracted out to a vendor in France. That vendor contracted out the required hydraulic motor to a vendor based in Sweden, but we worked with their Ohio office. We of course, were working the original customer, and the equipment had to tie into the infrastructure provided by a fourth company. This meant that we were constantly communicating through email, telephone, as well as more formal information requests with all concerned parties. Keeping track of the “scope of supply” for each company was a challenge. In addition, I familiarized myself with the document control system. Getting access to all the necessary systems and libraries was a task in and of itself. Documents must be uploaded to the appropriate databases, keeping in mind who needs to be notified of the change and what databases they have access to.

Gasification is the perfect place for anyone studying chemical engineering. The gasification plant is a huge chemical plant, and nearly everyone working on it was educated as a chemical engineer. This was a great opportunity as it allowed me to see what real world chemical engineering work was like. In my view, the most important thing I learned was what is valued in an engineering work environment.

My main source of training was my mentor. He was the person I went to for information whenever I had a question regarding the chemical engineering aspect of the job. I also had access to GE MyLearning site that hosts many online courses to familiarize myself with different aspects of GE business. Throughout my stay I got to know many people and I found them to be kind and willing to help me out without exception.
The Gasification offices are located in Houston, Texas. I was raised in Houston and lived with my parents during this co-op, so I did not have to go through the process of looking for housing etc. Houston is big city and there is a lot to do. Living in Houston pretty much requires a car as it is a very spread out city. The GE office itself is located near the Galleria and you can find any kind of food within a five-minute drive. Also, Rice Campus is less than twenty minutes away.

The best part of this job is that it is a clear window into the day-to-day work of typical chemical engineers. It shows how engineers fit into a large company and illustrates what skills are valued. I came here not really knowing what to expect or what I wanted to do for a living. I now feel that I can make a much more informed career choice. This co-op has given me a sense of where I want to go and how I can get there.
Work Assignment:

As a Co-Op student at GE Energy in Schenectady, NY, I worked as a member of the Systems Design and NPI team of the Generator and Electrical COE Group. The group, as a whole, is responsible for the design of GE’s electrical generators that are driven by gas and steam turbines at power plants around the world. The Systems Design and NPI team is specifically tasked with the optimization of generator system performance of new units and the modification and upgrading of existing generator models. The team specializes in the analysis of the electromagnetism, ventilation, and heat transfer in the generator, as well as in being able to identify and apply innovative concepts and ideas to optimize generator performance and reduce costs. The Generator and Electrical COE group is part of GE Energy, which falls under GE Infrastructure, one of the major businesses within General Electric.

During my rotation, I worked primarily with a small group within the NPI team, the Aero and Heat Transfer group. One of the lead engineers within this group was my assignment leader who assigned and supervised the three major projects that I worked on during my rotation. However, throughout the course of my rotation, I worked with and got to know the other members of my group who were more than willing to offer advice and assistance, as well as pass down work if they needed help with another project. I also had the opportunity to work with members of the Generator Requisitions team during my work on a new heat exchanger specification for the generators, to be used by the Requisitions team in ordering heat exchangers from external vendors.

My first few weeks involved some smaller projects, such as the analysis of fluid flow in ducts to support work being done by members of the team. This project allowed me to become more familiar with Microsoft Excel and Visual Basic, which are common tools used in many analysis applications. In addition to these smaller projects, I sat in on a few team meetings and design reviews, as well as read reports, or design practices, detailing the analysis and design of key systems within the generator itself, especially the ventilation and cooling systems. This allowed me to gain a better understanding of how the team functions and the types of assignments I was going to have.

One of the main projects of my rotation was the revision and release of a new heat exchanger specification to be used by the Generator Requisitions team to spec and order generator heat exchangers from external vendors. The main purpose of the project was to standardize and document the heat exchanger ordering process in order to prevent quality mistakes and support the global sourcing of heat exchangers. My first assignment was to develop an Excel tool to generate the heat exchanger specifications from the data output of a computer model. However, as the project moved forward, I became more involved
in working out the logistics of the new ordering process, and I had the chance to work with members of the Requisitions team and some of the heat exchanger vendors to ensure that the changes to the ordering process and specification met their needs. During my final few weeks, we were in the process of releasing the first of many new heat exchanger specifications.

My other two projects were much more analysis based and I mainly worked with my colleagues within the Aero and Heat Transfer group. The first was the development of a tool using Visual Basic to mine a database of generator design proposals, and analyze the heat exchanger performance for each generator design. The tool was specifically designed to employ a few methods to quantitatively analyze by how much a particular heat exchanger was over-designed for a given application. This information could ultimately be used to design a heat exchanger that meets the necessary specifications, but does not have significantly more performance capability than needed. Overall, this would result in cost reductions and a more optimized heat exchanger. The second project involved the modeling of the fan blades used in the ventilation system of the generator. My task was to develop a tool using Visual Basic, capable of generating a number of different airfoil and fan blade designs from a user’s input of various design parameters. The tool then generates the necessary input files for a CFD analysis program that one of my colleagues uses to analyze the fluid flow around the blade and the overall performance of the fan blade itself. Overall, the tool will help to reduce the time and effort involved in designing and analyzing generator fan blades. I also had the unique opportunity to assist one of my colleagues with some of his work at General Electric’s generator fan test facility at Rensselaer Polytechnic Institute. It was great to see something I was working on and learning about, and to experience a more hands-on side of engineering that I could not get in the office. Overall, both of these projects allowed me to develop some important technical and problem solving skills, while at the same time allowing me to gain a better understanding of the design process and engineering that goes into designing some of the complex systems within GE’s generators.

Learning and Development:

The work I was tasked with was directly related to my major in mechanical engineering. One of the great advantages of this opportunity was that I got the chance to see how some of the principles of heat transfer and fluid mechanics from class are applied in engineering practice. I also greatly appreciated how members of the team were more than willing to help and to talk about many of the interesting projects they were involved in. I have enjoyed my work and could certainly see myself pursuing a career as an engineer in the energy industry.

After talking to numerous team members at GE, I have decided that I want to continue my education after I graduate. I am interested in pursuing a master’s in mechanical engineering in graduate school, or applying for a position in one of General Electric’s leadership programs where I can pursue a master’s degree while working for General Electric. Overall, this has been a very worthwhile experience, as it has given me a better idea of what I would like to do after graduation and a better sense of what to expect when it comes to pursuing a career as an engineer.
**Life Outside of Work:**

For housing, there are limited availabilities in Schenectady that offer short term leases. Finding housing around nearby Union College may be the easiest option. However, according to a couple of my friends at Union, off campus housing is not nearly as popular as it is at Cornell, so finding housing can be challenging. I found a nice apartment complex about a block away from Union College, and less than five minutes from the GE plant. Using one of the housing search sites suggested by the Co-Op office is a helpful start, but contacting past Co-Ops is the best way to go. Also, GE does offer a $600 a month stipend for housing if your permanent address is outside a 50-mile radius of the GE campus.

There will most likely be a bunch of other Co-Ops working in Schenectady during every rotation. A group of us would go out to dinner once a week to try some of the many restaurants in the surrounding area. Many of us also played volleyball and soccer regularly after work, taking advantage of the very nice athletic fields and workout facilities at GE.

While you can get by without one, having a car is nice. Hiking and skiing in Vermont, trips to New York City, and visits back to Cornell are all within driving distance. Most weekends I did not stay in Schenectady, as I took advantage of the opportunity of not having schoolwork to visit family and friends at home and to travel back to Cornell to play for the club lacrosse team.

**Evaluation:**

Overall, my Co-Op with GE Energy has been a great experience. I have most enjoyed having the opportunity to work with and learn from the members of the NPI team who were always willing to share their experiences and expertise. I also feel that I will return to school in the spring with more focus and a greater appreciation for what I am learning, and where I would like my career in engineering to head.
Job summary

My term was spent as part of the Aero and Heat Transfer group in the Generator Core Design team. This group dealt with the cooling and ventilation designs for the generators produced by GE Energy. Most of my work involved the heat exchangers used to remove the heat load from the gas inside the generators. My work was mainly done using Visual Basic programming in Microsoft Excel.

My work built on programs started by previous co-ops. Like those co-ops, I was given ownership of these programs – I was the only person making changes to the code during my rotation. The programs I worked on were significant to the business: eventually the finished products will be tools or algorithms that will be used daily. I enjoyed having this degree of responsibility in my position. I looked forward to coming to work when I knew that I would have a challenging task to work through using my own ideas.

At the start of my rotation, I had no experience in heat transfer and extremely limited exposure to fluids, which were the two main physical concepts I worked with during the semester. I learned about these concepts by reading company reports as well as textbooks. My assignment leader provided me with reading materials whenever I encountered a concept I had not worked with before, so I could learn enough about it to complete my task. I liked this approach because it allowed me to learn about these concepts while still working on my projects, instead of spending some days just to read.

One of the main programs that I worked on was a physics-based heat exchanger model. The program modeled the performance of the heat exchangers used to cool the gas within a generator. I learned about the methodology used to perform the analysis, and became acquainted with the code that previous co-ops had written. Once I was familiar with the analysis, I was given the responsibility of examining the performance of the model, determining where it had problems, and implementing solutions to these problems in the methodology and code. I met occasionally with my assignment leader to discuss the steps I should take next in the project, but I was mostly expected to seek solutions to the problems on my own, including deciding how to implement some new algorithms to analyze more complex systems.

From this co-op assignment I learned a great deal about the engineering profession. I was able to participate in a design review, which was focused on the technical work done to test and validate a product, as well as an operations review, which was focused on how the business will benefit from the work we are doing. From these experiences I learned about creating effective presentations to convey a specific message to the audience. Moreover, throughout my rotation I was supporting multiple different programs at any given time, so I learned about balancing the workload between projects like the other engineers working here.
This position helped both my personal and professional development. I became comfortable working with and communicating with other engineers. I also learned what it's like to work in a professional environment, how to ask for help when I need it, and how to go about tackling new problems. I learned how to handle responsibility by being in charge of the main projects I was working on. I also learned to think about a project in terms of what is needed in the end and to work toward that goal instead of trying to do too much, because there will probably not be enough time to implement all the changes you can think of when modifying a program or process.

Overall, I was very satisfied with my first rotation at GE Energy. The physics analysis and problem solving work aligned well with my interests. I also appreciate that with the work I was given, along with the reviews and meetings that I participated in, I was able to get a feel for an engineering profession.
Co-op Work Assignment
In both its engineering and manufacturing functions, GE is organized into Centers of Excellence (COE). A typical "team" of employees can be identified by their COE. GE's Greenville site had been dedicated to its gas turbine business (for coal or natural gas power plants), both design and manufacturing. A few years ago the plant also took on some Wind turbine design and manufacturing. The major components of a wind turbine are the rotor blades, the machine head, and the tower. At various global locations, GE performs the assembly of the machine head. At the Greenville plant, GE assembles the machine heads for its 1.5MW wind turbine line.

I work with manufacturing in the Packaging COE. The Packaging COE manages various gas turbine assembly processes but also contains Wind turbine (machine head) assembly. I am an intern with the wind division. My primary role is to assist with Lean initiatives for the wind division (Lean Manufacturing is a set of manufacturing principles developed by Toyota that took ground in the US at the end of the last century).

For the first week, I observed as the rest of the team performed a "Lean Work Out" on one of our assembly workstations. A Lean Work Out is a week dedicated to scrutinizing a manufacturing procedure to find ways to incorporate and enforce Lean Manufacturing principles on the process. At the end of my first week, I participated with all the GE Energy interns in a remote phone/Webex introductory presentation by the Human Resources co-op coordinator (we phoned in to hear a presentation while viewing the PowerPoint in a web browser). During the first week, I gained access to most of the web services I needed (most computer tools and databases are web based), including the drawing set for the machine heads. The second week completed my orientation, as I assisted with each step in the assembly of a machine head in order to learn the process.

My desk is in an office on the shop floor. My first task was to prepare for the next upcoming Lean Work Out that took place about halfway through the term. This consisted of taking detailed observations of various workstations, organizing those observations, and preparing documents that summarized the assembly operations.

I started the second half of my term by carrying out action items for the Lean Work Out (updating the documents that instruct the operators for their work). I was also tasked with making (soldering) prototype circuits (according to drawings) to be used for small electrical test procedures in the assembly. I hadn't taken my circuits class yet, but the internet can be very resourceful. I helped obtain cost quotes for various custom equipment needs we have (including mobile carts with a +15 ton capacity), and met with local suppliers to discuss these needs. Part of this was looking into ways that we could establish a quasi-moving line in order to better structure the assembly process.
The other significant item I worked on was an Excel workbook that displays the machine head assembly process in an at-a-glance view. The workbook can be used to assess the effect of changes to the assembly process. Through this, I learned how to write programs in Excel through Visual Basic for Applications (VBA).

When a student receives an offer from GE, Human Resources pairs them with a Buddy. The buddy comes from one of GE’s two-year leadership programs, and having an intern “buddy” is actually part of their program to help them learn to be mentors. In any case, my buddy was helpful with answering some initial broad questions, but I did not talk with him much after that. One thing he was helpful with was putting me in contact with some leadership program employees who work at GE’s nuclear energy site. My desk is not near my manager’s desk, but the team meets every morning to discuss daily issues.

**Assessment of Learning and Development**

I attended an evening talk at GE about career paths. Various employees who’ve been at the company for ten or more years discussed the various positions they’ve held since college. The resonant idea from the talk was that to successfully advance one’s career, a person must have a broad foundation of experience. In this sense, my experience this term has been very valuable. For now, my plan is to pursue a career in the nuclear industry. I had hoped that I could work this term at GE’s nuclear energy site in Wilmington, NC. Being placed at the Greenville Gas Turbines site has given me a background in the growing energy field of Wind energy and on the periphery has given me some context on the development of turbines.

Your work doesn’t have much value if you cannot successfully communicate it to others.

**Life Outside of Co-op**

During the summer before the co-op, Human Resources provided all the Greenville co-ops with a list of each other’s email address. They also provided us with a list of about 5 local apartment complexes. On campus, I had lived in one of Cornell’s cooperative houses. I was hoping to emulate that living arrangement by renting a large house in which all of the 10 interns could live together. I quickly gave up on that and searched for 2-bedroom apartments on apartments.com. I found an apartment complex about 1 mile from the GE site, and rented a 2-bedroom apartment there with one of the other interns (electrical engineering). An important factor was the availability of short-term leases. The complex waived our deposit and application fee, since GE is on their list of trusted employers.

The rent didn’t include cable/internet, furniture, or electricity. We rented furniture from a local company, and continued to furnish the house by going garage-sale shopping during the first weekend. We each pay an approximate total of $500/mo. GE provides a housing stipend of $600/mo, so we ended up making an additional $100/mo. I would not make that extra sum if I sought a 1-bedroom apartment. We split bills and keep a running list in our hallway to track “IOU”-s. My apartment-mate pays for groceries and cable, and I take care of the electric bill. We’ll sum up the IOU’s at the end and one person will hand a check to the other to settle the remaining balance. Early on we were paying each other back on the spot and that just didn’t make sense.
The Human Resources department encourages one of the interns at each of GE's sites to take on the role of Social Ambassador. A returning intern assumed the role, and organized social activities and a weekly intern lunch. With his help, we organized two barbecues, an ice skating trip, a tour of the local BMW plant, and an unsuccessful paintball trip. He also encouraged us to participate in GE's volunteering activities. We also had the opportunity to share a lunch with GE's leadership-program employees (two-year starting jobs coupled with preparatory masters coursework).

The GE site is about 4 exits down the highway from the (small?) downtown city of Greenville. The city has grown tremendously in the last decade. This actually seems to be caused by large influx of New Yorkers (as a note, the city of Greenville has one of the highest numbers of engineers per capita in the US). The city is proud about offering free parking on weekends. On Saturday morning, Main St. is closed for a sort of farmer's market. While the weather is nice, free live music is available from public areas along Main St. during some weeknights. The weekend nightlife in downtown Greenville is very active with a large number of restaurants/sports bars. Aside from downtown Greenville, the area has become heavily commercialized, and the GE site is down the road from a strip of Walmart, 3 grocery stores, a Sam's, a Costco, and almost every other large chain (like Ithaca's Rt. 13 but twice as crowded with constant traffic).

The downtown area has a small and inexpensive bus system, but transportation is almost exclusively by car. One of the interns is from Puerto Rico and actually purchased a car soon after she arrived here. She has managed to find someone to buy the car at the end of the term. I had chosen an apartment close to the GE site so that I could bike to work, but I only managed to do that for about a month.

GE has a substantial Volunteering program. Employees receive emails every so often about opportunities to volunteer. I helped mentor an elementary school FLL Lego Robotics team, which GE was running and had funded. On Saturday mornings, my apartment-mate helped build ramps for the elderly/disabled in the area. The site has a gym with a small membership fee and offers classes (yoga, etc.) regularly. In addition to that, the site has many athletic clubs (running, hunting, cycling, etc.). Affinity groups (African-American Forum, Hispanic Forum, Asian-Pacific American Forum, and Women's network) often provide Lunch-n-Learn or other career-related talks (with food).

I learned that the evening after work isn't as long as I would like it to be. I spent a good portion of my free time working through a reading list I've developed over the past year.

**Evaluation**

I think for an internship it is beneficial to work for a large company because it seems that there is much more to learn than from a small company. At first I reacted negatively to the size of the company, which seems to cause corporate messages to be filled with careful rhetoric. The company goes so far to protect intellectual property that employees are only to use flash drives if the information is encoded in some way. The company recently started a
company-wide “HealthyAhead” initiative to encourage employees to live healthier lives. Big companies are more concerned about preserving their image than are smaller companies.

However, a large company benefits from being well known. GE can achieve favorable terms with its purchases, and suppliers will easily trust GE. And while the process to make purchases might involve more red tape than for a smaller company, a big company just has more money. GE (Financial Services) funds the small companies. The secretary of energy Steven Chu visited the plant last month and answered questions from the local media. That’s just something that wouldn’t happen at a smaller company.

GE’s Internship Assessment program is as rigorous (involves as much paperwork) as Cornell’s. While Cornell’s program focuses on the learning achieved during the rotation, GE’s program focuses on the work the intern has accomplished. During the first two weeks of the internship, interns must work with their manager to develop a list of goals (concrete work objectives). Halfway through the term, the interns are to meet with their manager to discuss their progress toward these goals and to share advice.

During the final week of the internship, the intern has a 15-minute interview with Human Resources about the strength of the internship program and their desired location/position for their next rotation if the intern is hired back. The intern also fills out an online form that asks for similar information.

**Additional Info**
We had 3 paid holidays: Labor Day, Thanksgiving Day, and the day after Thanksgiving. Paychecks are mailed biweekly on Thursday, but I signed up for direct deposit. I retained about 75% of my earnings after tax.

I’ve used the terms internship and co-op interchangeably. GE makes less of a distinction between the two than Cornell does. Most of the other interns here are doing one of many rotations, and usually are doing so as part of a mandatory co-op program from their school. The other interns during my rotation came from Tennessee, Florida, Ohio, and Virginia.

GE’s offers are for one term only (fall, spring, summer). Thus, I am not guaranteed a position for next summer (receiving an offer for next summer depends on my GE evaluation and on GE’s need for interns).
Alecia Camillo  
Net ID: amc354  
Major: Mechanical Engineering  
Employer: General Electric  
Term 1  

Job Summary

A. Co-op Work Assignment

During this term, I worked in the power services in the energy division of General Electric. I was part of the Energy Technical Training team and my supervisor was Matt Vaupel, the ETT manager. The ETT team is responsible for providing training for customers who have purchased Gas/Steam turbines. Companies will hire General Electric to train their field engineers how to operate and maintain their multi-million dollar turbines. I had three major projects throughout the term: reviewing and editing web based training courses and the course description catalogue, completed part of the Edison courses on Gas/Steam/Wind Turbine operations and maintenance, and was responsible for finance review for the team.

My first week at GE I had a series of orientations. The first orientation was led by the Co-op coordinator Katie Pustolka, who introduced me to the company and the various branches of GE. My supervisor also gave me an introduction specific to the ETT business and to the facility I would be working in along with my co-workers. My first project was also an introduction to the technology and terminology of Power Services.

B. Assessment of Learning and Development

I think my internship here was the perfect exposure in relation to my education and what I would like to do in the future. I got to visit and see the manufacturing plant of steam turbines, a wind turbine in the field, and the global research center. Also in the Edison class, I really saw how some of the classes I have taken apply to theory and construction of turbines. Along with an in-depth exposure to the engineering field, I also got to experience firsthand what a business is like and project management. In the future, I am considering getting an MBA and pursuing a business path with a background in engineering and therefore my co-op experience was a great introduction.

Throughout my co-op, I learned how to effectively express myself via different types of communication such as e-mails, phone calls, and in meetings. I also learned the importance of voicing your opinion and not hesitating to suggest an idea.

C. Life Outside of Co-op

I roomed with another Cornell student also doing a co-op with GE. One recommendation I would make is to start searching for apartments in advance, as most landlords do not want to sign a 3-4 month lease. However, we were lucky to find a cheap
apartment near Union college, another recommendation would be to search for housing near universities as you can more easily find short-term leases. A car was necessary in Schenectady to get to work, to go grocery shopping, and to run other errands. GE has a pretty well establish co-op program and have social chairs as well as community service chairs. So we were always informed about upcoming social and community service events such as farewell lunch, 5K walk, and Halloween barbeque. My team asked me to join their bocce team and we competed with other workers in the building during lunch, it was a lot of fun! There was a gym available to me in the building.

D. Evaluation

Overall, my first term as a co-op student was a great experience and exactly what I hoped it would be. I was exposed to field engineering, the challenges of a multi-billion dollar business, and what it is like to be in the professional world. I felt like a respected member of the team and learned a lot from my co-workers. For the second term, I am hoping to get a little more experience to the engineering field but overall I was satisfied by my experience.
My job was as a manufacturing engineer at General Electric Energy in Greenville, South Carolina. GE has many subdivisions, including GE Energy, which builds Wind, Gas, and Steam turbines for power generation. Greenville, SC is the home of the main manufacturing plant for the gas turbines. I was a part of Unit Assembly, the group that takes all of the components and puts it all together to make the final turbine.

GE has a very well defined co-op program, called the Early Identification Program, which is a feeder for many of its new hire development programs (such as the Operations Management Leadership Program and the Edison Engineering Development Program). The managers from all of the GE locations request co-ops, and an outside HR team places the co-ops based on preferences into locations and jobs. I was placed under a manager and was given a “buddy” to work with. I was encouraged to approach either one if I had questions, and had a very close working relationship with both.

As a manufacturing engineer, it was my job to make the manufacturing process more efficient. I was trained in Lean methodologies, the Six Sigma process, 5S methods, and the Toyota Production system through online GE internal courses. I had many different projects that I was a part of, from reducing defects in external parts, to improving processes, to making the working environment safer and more ergonomic.

Traditionally, a job like this would be handled by someone who has a background in Industrial Engineering, but it turns out it’s very easy to pick up, regardless of major. While it didn’t align at all with my major, I did end up having some integration of my learned material during my job, with a materials analysis problem towards the end of my term. As I’ve had a background in the engineering design side of work, and in the research side, it was both refreshing and expanding to get to work in a manufacturing environment.

This job, and likewise any job in a manufacturing environment, requires a lot of leadership abilities, respect, and initiative. You have to learn how to work well in a team composed of hourly operators to salaried managers. I was routinely required to pitch ideas, solutions, or approaches to managers, and also required to empower the workers to implement positive changes. I have increased my communication skills tremendously, and it has validated my own belief that I have valuable opinions to contribute, enabling me to speak up when I have a strong belief about a subject.
Outside of the work environment, because GE is such a large company with such a well-planned co-op program, there were around 19 other co-ops to interact with as well as the plethora of OMLPs and EEDPs. We ended up choosing three people to serve as “chairpersons,” of professional development, community service, and social activities. I highly recommend this to any co-ops, as we were able to participate in many activities that would otherwise have been impossible without good leadership. For professional development we visited the GE Aviation plant in Greenville where they manufacture airplane engine blades. We visited the BMW plant as well, and were spoken to about the EEDP and OMLP programs. For community service, GE has a great program called GE volunteers which sponsors community service projects. We built ramps for disabled individuals, built playgrounds for elementary schools, and fed people at a local homeless shelter. For social activities we went to a minor league baseball game, hockey games, and went paintballing. We held weekly potlucks, including a large thanksgiving one, went out to several movies. We organized Friday lunches at local restaurants, as well as going to bars, dancing, and hanging out at each other’s’ apartments.

Greenville, it turns out, is a beautiful little gem in the middle of upstate South Carolina, close to the North Carolina border. It is very quaint, and because of its ties to large corporations and manufacturing, boasts a large number of people ranging in age from mid-20s to retirement age (Fun fact: Greenville has the largest number of engineers per capita than any city in the US). It has a bustling downtown, and provides cultural opportunities such as concerts (Justin Bieber and Trans-Siberian Orchestra were just here) and outdoor food and music festivals. It is nestled into the foothills, and offers beautiful scenery and the outdoors. People often hike, fish, ride bikes, and hunt.

Greenville is also spread out, and its centers of industry and centers of culture are on opposite sides of the city, so a car is a requirement. Rent is fairly cheap here, ranging around $600 for short-lease one bedrooms.

The best features of this job were definitely the people. The people here have been very friendly, outgoing, and inspiring. The worst feature of the job was probably the lack of IT support.
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Rcl78  
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Fall 2010

Working at GE Energy

GE Energy's job placement process for interns is different than most other programs. When you accept an offer from GE Energy, you accept a general offer of employment with no indication of your particular work assignment. Several months before your expected work term, you will be given an opportunity to select your top five preferred work assignments from a list of all available GE Energy internships within the United States. In this way, GE gives you a level of autonomy in selecting the content and location of your internship experience. I "pref-ed" to work in Steam Turbine Conceptual Design in Schenectady, NY and was lucky enough to receive my first choice.

The Steam Turbine Conceptual Design department did not offer a formal orientation or technical training program at the start of my term. On the first day, I was introduced to a majority of my co-workers and was given a collection of packets, binders, and articles that described different steam turbine features and design criteria. Over the course of the first couple of weeks, I had conversations with multiple co-workers that transitioned into instructional lectures about their areas of expertise. These conversations, supplemented by the reading material, constituted my training/orientation. While I was anxious to begin working, the reality was that I knew very little applicable information about steam turbines and I had several logistical requirements to take care of—predominantly, setting up my computer and receiving clearance to access company servers. Everyone in the office had an appreciation for the settling-in process and I was initially given little responsibility. In fact, for the first week or so, I was not given an assignment leader. There didn't appear to be any formal process for determining an assignment leader but eventually, it became clear that I would be receiving assignments from the department's principle engineer.

After a couple weeks, I began to receive my first real assignments. As I completed them, I was granted more important work. I was pleased to see that I was being rewarded for my past performance with each new assignment constituting a more challenging
problem or critical action. From speaking with other Cornell co-ops, I know that some companies relegate their interns to unimportant tasks for the extent of their work term. During my GE internship, this was not the case. The projects that I worked on had clear line of sight and contributed to my team's objectives.

My major work assignment was to create a rotor geometry builder for an automated steam turbine design program. I was given responsible for generating and presenting the logic that would be used within the master program. My efforts involved researching legacy data, determining input values and establishing a step-by-step process. I also created sample calculations and outputs for reference by the programming team. When I completed the rotor builder specifications, I was given the autonomy to plan and execute my own validation process. As part of the validation testing, I was responsible for delegating work assignments to a co-worker in India—a great opportunity to demonstrate leadership. Over the course of the entire project, I developed a solid understanding of turbine rotor design criteria and was exposed to various other aspects of steam turbine design. I worked alongside other members of the system model team to ensure cohesion between upstream and downstream executables. I gained a sense for the complexity that can be involved in managing a project that requires handshakes between numerous programming modules. While the project did not involve significant theoretical engineering work, I was required to apply the critical-thinking and problem solving skills that I developed through Cornell Engineering. Now that I have been afforded the opportunity to reflect, I must say that I was pleasantly surprised to receive a critical, fast track project. I would have appreciated a bit more theoretical engineering work or training but the current business needs did not happen to align. My work on the automated steam turbine program allowed the team to successfully meet a December 2010 release date. I think it's rare for an intern to be given the opportunity to make such a direct impact on the company's goals, which is a testament to GE's internship program.

The general work environment at GE is very friendly and accommodating to interns. My co-workers were immediately attentive to my presence in the office and were more than willing to answer questions when approached. Perhaps most importantly, I felt like my colleagues respected my knowledge and assumed that I would be able to bring useful contributions to the table from the start.
Life Outside of Co-op

Like many co-ops, my most immediate concern aside from where I was working was where I would be living. Fortunately, GE offers a housing stipend that is generous enough to cover the rent for a comfortable living situation in Schenectady. Unfortunately, the housing options are not very diverse in the capital region and are even more limited when you request a short-term lease. I would suggest that you begin your housing search early. For my housing, I was lucky enough to find a RPI professor who lived by himself in Green Island, NY and was going on sabbatical for the fall semester. A friend of mine who was also on co-op in the area and I were able to rent the three bedroom apartment for considerably less than the advertised value. While we were offered a reasonable price and the accommodations were comfortable, I was left with a 35 minute commute to GE's campus. I was able to bring a car on co-op with me so the commute wasn’t a problem but if I had to rely on some mode of public transportation, I do not believe that I would have been able to get to GE from where I was living.

Socially, the capital region does not have many entertainment opportunities. My friend and I decided to leave the area most weekends and visit friends or family. After nearly 17 weeks of work, I believe we only remained in the area for one weekend. During the week, the social opportunities consisted of bars and restaurants in the area. There were also several events organized by the 'GE intern social chair' – an intern who volunteered to organize events. These mainly consisted of activities like potluck dinners or seasonally themed gatherings (i.e. a pumpkin carving party near Halloween). The GE social events will vary depending on the social chair’s creativity and judgment. While I did not choose to attend any of these events, the option was always there.

GE had a variety of community service opportunities (probably 5 or 6 events during my work period); unfortunately, they were always offered on the weekends and as I mentioned early, I generally was traveling.