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Mechanical Engineer
Fall Co-Op at ASML

ASML designs and manufactures Lithographic systems used in the microchip manufacturing process. I worked on the next generation alignment sensor used to position the silicon wafer being processed by the system. The sensor as a whole requires engineers from several disciplines including software, optical, electrical, industrial, and mechanical. I worked with the mechanical development group, whose job it is to design and analyze the housing and mounting systems within the sensor. I worked on a variety of projects ranging from materials testing and excel programing to test plan writing and basic 3D modeling. One of the hands on projects I worked on was testing the thread strength of a specialty material being considered for our sensor. I was responsible for running the testing, including recording, analyzing, and reporting the results of the test. At the end of the test I wrote a technical document outlining the test and was able to talk with the manufacturer of the material about the results. I also wrote a test plan for future analysis of mechanical mounts to be used in my team’s module. I had to determine appropriate testing conditions and what data we wanted to pull from each test. I also had to outline all of the resources and equipment needed for the test. This required talking with vendors to get quotes on high precision equipment as well as people working for ASML working in the labs here. It also required modeling the whole test set up using CAD software. Another task I was assigned was to automate the design calculations for several common Opto-Mechanical situations. I used Excel and Visual Basic to create an interface for running calculations on effects of stress, temperature change, stiffness of parts, and other factors considered in the design process.

Training was provided through group trainings in person, as well as individual computer based training modules. The topics of these trainings typically focused on Knowledge, Safety, or CAD modeling software. We also got tours of the clean room facility used for manufacturing and testing of many precision parts. ASML uses a similar CAD system to Solid Works so it was not too hard to pick up. The main thing I picked up in the trainings was where to find the buttons and tools with in the new software that we had been taught at school in Solid Works. I was also able to improve my knowledge of the computer aided design by trying to create small parts on my own and asking team members questions when necessary. Everyone I came into contact with was extremely helpful and always willing to give me a few minutes of their time to answer my questions or point me in the right direction. I had a mentor that I met with weekly to discuss my current assignments and address any concerns I had about my job. Outside of this weekly meeting I could always go to the members of my mechanical development team to answer questions or ask advice.

This co-op related well to my undergraduate studies in mechanical engineering. My understanding of dynamics, material properties, and CAD software were the main things I was able to pull from the class room and apply at ASML. Classes such as MAE 3260, MAE 2250, and MAE 2120 were particularly helpful to have taken before coming to ASML. This co-op made me understand that it is not the individual equations and details that you need to know as an engineer, but rather how to apply the principals.
behind those equations to design and analyze mechanical systems. This experience has broadened my view of mechanical engineering. Previously I assumed that mechanical engineer jobs were just in the aerospace and automotive industries but now I realize that mechanical engineers work on a much wider range of companies, including semi-conductors companies such as ASML. From this co-op I was also able to understand the importance of communication and team work with in professional engineering. There is not a single project or idea that is completed alone, all designs and ideas get input from many other people even if the task is assigned to a single engineer. Being able to communicate your ideas and understanding of a task is crucial to being an effective engineer. It is one of those things that people always told me but I never fully understood until I worked at ASML. I believe I was able to improve my communication skills through talking to a variety of people with in ASML as well as interacting with vendors.

Housing is not very easy to find during the fall term. ASML does not currently offer assistance with housing but is looking to do so in the future. While there are several universities in the area, I was not able to find appropriate housing at any of them. I ended up finding a short term room for rent in Stamford CT, about 25 min drive from the office. I did not have a good experience with this living arrangement (I did not get along with my landlady/housemate) and would recommend a more informal approach to living at a local university through Facebook groups (a “free and for sale” group or maybe just a “Class of 2015” page) rather than the school housing office. There is a bus stop very close to the office so a car is not required but this sort of limits you to living in Danbury or Norwalk. I would strongly recommend having a car in order to get to work and for basic transportation on the weekends. ASML offers community service in the form of an after school program for middle school students designed to engage them in science. Unfortunately due to scheduling and snow days I was not able to participate in this program. In terms of athletic opportunities, ASML has a pick up soccer game once a week while it is still light out after work. For more after work opportunities I would recommend checking out MeetUp.com where there are tons of postings for events in the area and attendance is very informal. I was able to meet a lot great people through a Frisbee meet up this way. NYC is also just a short train ride away and there are plenty of social opportunities there.

The best part of this co-op is being able to see how concepts from the classroom are actually applied to technical situations. I also really enjoyed talking to other engineers about how they came to work at ASML and what suggestions they had about pursuing mechanical engineering. Another great part about ASML is the amount of resources it has in terms of facilities and tools as well as people. While the size of ASML means they have more resources than a smaller company, it also means there is more bureaucracy that can slow things down. It is important to be working on more than one thing at a time because sometimes you have to wait on someone else in order to move forward. I would say that overall my Co-op experience at ASML has been a positive one so far. I have been exposed to a lot of different opportunities and a wide range of people. I am glad to be participating in the co-op program and look forward to coming back next summer.