GET INVOLVED!

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Hello future chemical engineers! This PDF was created by NMSU Omega Chi Epsilon with the intention of giving incoming chemical engineer majors a better idea of the types of opportunities there are to make your chemical engineering degree more meaningful. Doing a summer internship and/or research on campus will make you a better applicant for the work force or graduate school. It will also enable you to see the broad spectrum of what you can do with your degree and what field of study you enjoy. Without a doubt, you will only benefit from these experiences. They become lifelong memories and the networks you make will only help your career in the future!

NMSU Omega Chi Epsilon
Student Chapter 2014-2015
Research on Campus

Doing research on campus is a great way to start getting work experience that internships value a lot! It’s also a good way to make a stronger bond with a faculty member. It would be beneficial to get an idea of what research is from the beginning of your college career so that if you have the desire to pursue graduate school, you will have a ton of experience under your belt. The summer after freshman year would be an ample time to start. If you decide that research is not for you, at least you will have tried the option and can cross it off the list. Nonetheless, employers like to see that you are able to work in groups, critically think or have innovative skills, and are open to new ideas.

Something to note is that you are not only confined to the chemical engineering department. If you think someone in chemistry, biology, agriculture or wherever you please is doing interesting research, talk to the professor! Many times they will be happy to take you on in their lab if you have a sincere interest and can commit some time to conduct a project well. There are many programs through NMSU that will pay you to do research, such as AMP, MARC, RISE, BRAiN, and Howard Hughes. You can also take research credit in which your research mentor will give you a grade.
What is a REU?

Research Experience for Undergraduates (REUs) are great summer opportunities available at hundreds of universities across the nation! They are usually 8-10 week programs that introduce you to basic science research skills and enable you to delve into your own research project in which you become the expert. You usually receive an average stipend of $4500 dollars over the summer to conduct research at another university under mentorship of a professor in which you expressed an interest in his/her field of study. Most of the time housing and travel expenses are covered. These universities will teach you what it takes to get into graduate school and will share with you the opportunities they have at their school. There will be other students from across the nation that make up your internship cohort (ranges from 12-20 people) which you are likely to be house mates with. Cohorts tend to form strong bonds during their internships. At the end of the summer, you will create either a poster or power point of your research that you will present at a symposium to your mentors and peers.

You can find these opportunities by just searching online! Also, Dr. Rockstraw posts several opportunities on the NMSU Chemical Engineering Facebook page and mass emails are constantly being sent from the engineering domain. Deadlines for these programs run between January-March. Get looking quickly because most applications require 1-2 recommendation letters. Give your professor at least a 2 weeks’ notice to get the letter of recommendation letter done. Also note that Dr. Rockstraw is always willing to help!
PROJECT DESCRIPTION

I determined the Internal Conversion Coefficient of the $^{111m}$Cd isomer. Internal conversion is a type of nuclear reaction in which a K-shell electron gets ejected out of the atom in order for the isomer to reach ground state. To do this, I analyzed scans with gamma spectroscopy after my sample was activated with thermal neutrons at the nearby nuclear reactor. At the end of the program, I had to showcase my work to the cyclotron institute professors through a poster and a power point presentation. Afterwards, I was invited to present my poster at the annual APS and JPS Nuclear Physics Division meeting.

PERSONAL EXPERIENCE

Working at the cyclotron institute really helped broaden my knowledge in nuclear physics. Every Wednesday a professor from the department would give us a lecture over their work. Besides the research, TAMU provided us with a lot of tours of their other labs. Some examples are: the wind tunnel, the cyclotron institute, observatory, nuclear reactor, the nuclear fuel cycle lab, and their First Fridays Physics demos. TAMU also offered the REU students an invitation to their early Graduate School admission program.

Though there isn’t a lot to do in College Station, TX. we found many ways to have fun. The REU group and I learned how to salsa dance, had laser tag battles, went to Galveston, visited NASA, watched the World Cup final in a room full of Germans, and toured the George Bush Library. Although we all go to different schools, we still communicate through a facebook group. In October, some of us were reunited at the nuclear division meeting in Hawaii. It’s corny, but we usually never say goodbye because we all know our paths will cross again.

How did you get your internship?

I applied online at cyclotron.tamu.edu/reu. The application consisted of three short answers questions along with two letters of recommendation and an official transcript. Having past research, and knowing how to program (Linux, Fortran, Mathematica, Mathcad) really helps in the application, along with showing interest in the graduate school program at TAMU.

Want to learn more? Contact:

Laura Pineda
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Expected graduation date: May 2015
PROJECT DESCRIPTION

I worked as a research assistant in Data Mining and Classification techniques. This field was even new for my mentor, Dr. Derrick Rollins, so I started this project from scratch. Together, Dr. Rollins and I modified his pre-existing Principle Component Analysis (PCA) approach and developed two new classification techniques to separate seven binary, imbalanced data sets. I worked mainly with Minitab and Excel and am a co-author of this work in our paper: "A One-Dimensional PCA Approach for Classifying Imbalanced Data," which is currently published in the Journal of Computer Science and Systems Biology. At the end of the summer, I presented my work at a poster symposium. This work has also been presented at the National AIChE conference and Genetics & Genomics (Online, 2014).

PERSONAL EXPERIENCE

I loved my internship. Iowa State has a great campus and the Chemical and Biological engineering faculty and staff were extremely helpful. My mentor pushed me to teach myself and work independently in a new field. I became really close with my cohort members and still keep in contact with them. During the internship we would do group activities and cook together. I actually even went to visit my apartment mate who lives in Puerto Rico. I made life-long contacts from this internship and would definitely recommend it!

How did you get your internship?

I heard about this internship from an online posting. Iowa State puts on several internships over the summer but the one I did was called BioMap. It was a simple online application requiring a brief essay, transcript, and two recommendation letters. Hundreds of research internship opportunities can be found online!

Want to learn more? Contact:

Varayini Pankayatselvan
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Expected graduation date: May 2015
My research focused on using engineered proteins to create biosensors that could detect different concentrations of breast cancer indicative biomarkers.

Overall my trip to University of Pennsylvania was an amazing experience. I got to live in a frat house with fifteen other people, I got to visit the east coast for the first time, I formed strong relationships with students from across the nation, and (most importantly) I was able to network with people from different universities. If you’re interested in research, REUs are a MUST.

I learned about the program by simply googling summer REUs for chemical engineers (specifically research projects that were similar to my experience in the labs). I feel that lab experience is the most important factor in landing an REU (recommendation letter from your PI really helps).

For more information contact me, Rodrigo Rodriguez (Senior), at rodrigor@nmsu.edu
PROJECT DESCRIPTION

I worked with Dr. Sally Davis at the Prevention Research Center doing community based research. I specifically contributed to a Health Impact Assessment to analyze the effect of trails on the quality of life, specifically social capital, of Cuba, NM residents. The HIA was submitted to the Bureau of Land Management and the Santa Fe National Forest Services so that more walking/hiking trails can be constructed with easy access to Cuba residents. I learned about the importance of prevention and community engagement. Also, I learned that factors such as environment, resource access, and socioeconomic status all influence health. In doing so, I worked with qualitative and quantitative data. Additionally, I was able to go to Cuba and participate in the summer science camp. It was extremely eye-opening to see how the different adolescent ethnic groups interact and how they are all affected by resource scarcity.

PERSONAL EXPERIENCE

This internship taught me the other side of health care. Many times we get wrapped around thinking that only one person is responsible for his/her individual healthcare when really it is affected by several factors in which they have no control. I met great contacts through the medical school and loved meeting my cohort members who were from across the nation. We became a close knit group and most of us attend the SACNAS national conference in Los Angeles, California to present our research. I would definitely recommend this internship to anyone interested in going into the medical field.

How did you get your internship?

I found this internship by just searching online. It is specifically called the Undergraduate Pipeline Network. I had to write a brief essay about my interest in the medical field and had to submit one recommendation letter. I can’t stress enough how many opportunities there are available by simply searching online!
What is an Industry Internship?

Industry internships are summer long work experiences at which you are a paid employee of a company. Common industry recruiters at NMSU include Palo Verde, Exxon Mobile, DOW, and Chevron Philips. You get to work in various fields of engineering ranging from process controls, reactor design, and unit operations. You will be with a group of other engineering students across the country and usually make lasting friendships with them as well. Industry experience will enable you to get a gist of the company’s ideals and work environment. If you are interested in getting a job right after you graduate, industry experience will definitely give you a more competitive edge as an applicant.

You can get internships from the fall and spring career fairs! Don’t get discouraged if you didn’t get an internship in the fall. You still have a chance to score one in the spring! Brush up your resume, dress in professional attire, and research the companies you are interested in talking to. Also create a profile at the Aggie Career Servicers so your resume can be sent out to possible employers.
Facility Design Engineering Intern

I had a unique internship with ExxonMobil where I worked for a smaller company that they had just acquired known as XTO. As a part of my internship I traveled between Houston, TX and the Permian Basin located in Midland, TX. While working for XTO I traveled to the oil production sites and developed the facility designs to meet increased well production rates. I was able to work alongside operations, the construction foreman, the engineering technicians, and numerous engineers. My responsibilities included creating Piping and Instrumentation Design (P&IDs), calculating current capacities of the production sites, designing new flow lines and determining appropriate equipment upgrades. By the conclusion of my internship I had developed two new facility designs that will be constructed early next year.

Make Lasting Memories

My internship with ExxonMobil was an incredible chance to learn about the various opportunities provided by the oil and gas industry. Working for both ExxonMobil and XTO gave me a broader perspective of the industry culture in both a larger corporation and a smaller company. I was placed with incredible supervisors, managers, and mentors who entrusted me with a large amount of responsibility and what I appreciated most was that I was allowed to work independently to analyze the problems presented to me and determine a solution.

As a part of my traveling experience, I was able to build a diverse network of contacts, but also incredible friendships both in Houston and Midland. One of the most important decisions I made during my internship was to take advantage of every trip/event/outing and just make the most of it and have fun!

How did you get your internship?

I went to the fall career fair during my sophomore year, and was provided with a follow up interview. My best advice for these interviews is to research the company beforehand and know what interests you. Be prepared to answer why you are interested in their company, but don’t be afraid to ask them why they love their job. Let them sell you just as much as you sell yourself.

Want to learn more? Contact:
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Expected graduation date: May 2016
I had a unique industry-based internship experience at Intel Corporation where I had the opportunity to work on various projects throughout the summer. Primarily, I worked in Ultra-Pure Water processing and Industrial Waste systems group. I got to work on a couple energy conservation projects where the focus was to optimize efficiencies in the systems and reduce waste and water consumption as much as possible. This was a great experience because it allowed me to familiarize myself with an industrial plant setup. Seeing how heat-exchangers, cooling towers, and mixers work in real life was awesome, and has been so helpful when I came back this fall semester for my junior chemical engineering classes.

At the end of the summer I had to do a final presentation for all of the area managers at my site.

I had a great experience in my internship! I loved going to work every day; I constantly learned new and exciting things about chemical engineering, time management, technology development, and of course corny nerd jokes. I loved the group of engineers I worked with; they were incredibly knowledgeable and I learned a tremendous amount in a very short time period. My mentor was awesome as well; we went to lunch often and talked about everything from career paths to backpacking Europe.

I lived in Rio Rancho which was great because it was close enough to go home and see my family often. I am still in contact with my manger this summer, she has become one of my mentors. She even called to give me tips before career fair, and is someone that I look up to and respect very much.

How did you get your internship?

I was involved in networking opportunities provided by the College of Engineering and the Aggie Innovation Space. My tip on how to get internships would be to work hard, say yes to opportunities when they come along, and most importantly BE YOURSELF! It is helpful to keep your resume updated, and keep in contact with your references.
Environmental Internship
Palo Verde Nuclear Generating Station
Summer 2012

PROJECT DESCRIPTION
During my Internship, I was mentored by the Environmental Field Technician. I spent most days taking water and air samples and preparing them for shipping to the lab that would examine them.

When I had extra time I read through the environmental work permits for the site and pinpointed all the required testing, and made a calendar so none would be missed.

PERSONAL EXPERIENCE
As a freshman, much of what I did and saw were very new to me and what left the biggest impression on me was how big companies like that work. While every company is different, there’s a pattern amongst. The key to doing well there is to get to know the people you work with, be outgoing without being arrogant, and never pass by an opportunity to try or see something new.

I personally loved Phoenix, and had a great time there. I couldn’t have asked for a better mentor or work group. Overall Palo Verde is a very interesting place to work.

How did you get your internship?
The career fair. I know a lot of freshmen assume they’ll have no luck getting an internship, and many don’t even bother to go. Truth is you can get an internship. I did so you can. Even if you don’t get an internship, most of our recruiters return every year, even every semester and they do remember us. So go and make a good impression

Want to learn more? Contact:
Christina Chavez
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Expected graduation date: May 2015
Project Engineering Intern
Chevron Philips Chemical Company
Summer 2013

PROJECT DESCRIPTION

I had several projects during my internship that gave me a pretty good view of different parts of an engineer’s job.

My first and primary project was to review, test, and implement a change in how a piece of our equipment ran so as to increase efficiency. At the end of my internship, I presented on this project to the company executives.

I also had a project in which I combined spreadsheets and a process-monitoring program, which allowed engineers and operators to track the performance of individual pieces of equipment.

Finally, I spent time tracing a system through the plant to identify any changes that could be made to increase efficiency and decrease wear of the system. This included reading through permits to determine plant requirements.

PERSONAL EXPERIENCE

This internship gave me a clearer picture of what exactly engineers do. It also helped me expand my idea of how things have to be done in a manufacturing plant.

CPChem was a great company to work since they have such amazing values. Not only do they value safety, but they want their workers to be happy. The employees were very close and it was almost a family environment where the older engineers looked after the newer and everyone did what they could to support each other.

My mentor was absolutely brilliant and helped me not just do my projects but understand how and why I was doing what I was doing. It was very enjoyable knowing that I wasn’t doing busy work, may projects were of actual value to the company.

An Intern Trip to South Padre Island

How did you get your internship?
I got my internship at the career fair. Make sure you talk to companies you’re interested in, even if you’re not sure you meet all they’re requirements. You won’t know unless you ask, and at worst you’ll have a recruiting contact within the company.

Want to learn more? Contact:
Christina Chavez
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Expected graduation date: May 2015
PROJECT DESCRIPTION

Worked as a process engineer in an ethylene plant. My project was to find and eliminate a bottleneck within the system.

Presented to the leadership team at the end of the summer.

PERSONAL EXPERIENCE

Houston is a great place to be for a summer. It is impossible to get bored. I had more fun this summer than any other summer.

There is so much to learn about the industry and the plants themselves that it cannot be done in a summer. I learned so much, and most of it will not be taught in the classroom. It was really cool to see topics that are taught in the classroom come to life in the plant. I also learned about the dynamics within the company, how to interact with the operators and engineers, and the real world application of what you read in textbooks. The people at CPChem are amazing. I felt at home on day one; everyone is super friendly and wants to help you learn and succeed. I was given a formal mentor, but it seemed that just about everyone I interacted with was a mentor. I would definitely recommend applying for an internship with CPChem to every CHME.

How did you get your internship?
Career Fair.

Want to learn more? Contact:
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Expected graduation date: May 2015
PROJECT DESCRIPTION

My primary project for the summer was a documentation project. I was tasked with working with two operators to trace a system in one of our units. The project included digging through old file, permits, and designs to find the design specification, that is, what the system could and could not do, and how the system was designed to function.

This project was time sensitive, since major reconstruction was the end goal and the system had to be up and running by the time temperatures began to drop in the fall. As such, I got a feeling for how full times engineers have to balance different projects to prioritize those that have a finite deadline.

I particularly enjoyed this project because I spent nearly half my time working hand on with the plant operators. Operators have a completely different job from the engineers and, so, have a different view of the plant and the procedure. I found that it was incredibly useful to both the engineers and the operators to gain a full and rounded view of the plant.

PERSONAL EXPERIENCE

I was working at a plant in Midland, Michigan which was an area very different from what I’m accustomed to. I found that I absolutely love the town, and the people. This was also the largest group of interns I’ve ever been around since DOW headquarters was in the same town. That meant that not only were there the engineering interns but also the HR, Accounting, and business interns. Network, network, network.

This summer was the closest I’ve ever really come to how it will be once I’m full time. As an upcoming senior I had more classes under belt, which made a huge difference in what I understood and what I could do. The work was fascinating and there was a lot of it, but I enjoyed it all.

At the end of the summer I presented my project to my plant manager as well as the engineers and operators that I worked with all the summer. The really exciting part for me was that as soon as I finished my presentation they began planning how to implement the improvements I had helped identify. I also found that I had learned more than I realized when they asked me questions.

How did you get your internship?

I got this internship at a career fair. While you should practice and think about how you’ll answer interview questions, try to relax and be yourself. We had workshops over interviewing, and the largest thing all the interviewers stressed was that being comfortable with yourself can really shine through and make a difference.

Want to learn more? Contact:

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Expected graduation date: May 2015
What is a Co-op?

Co-ops are similar to industry internships, but they extend throughout the school year. You will be set behind a year if you choose this route, but co-ops no doubt make you a stand out applicant for industrial jobs! You will be able to immerse yourself more into a company’s project, make stronger network connections, and experience typical work days. You can obtain a co-op from the career fair and by having your resume on Aggie Career Services.
PROJECT DESCRIPTION

My work consisted of finding ways to improve sterilization processes of two reactors. Each contained “pencils” of cobalt-60, a source of gamma radiation. This radiation is used to sterilize medical devices and surgical instruments used by hospitals.

I used dosimetry to measure external radiation doses and ensure that Ethicon’s products were properly sterilized. I also sampled run times of each reactor and created a spreadsheet for the technicians that quantifies reactor runtime and downtime. Cobalt-60 is a capital investment and its effects must be utilized as much as possible.

In essence, I worked with sterilization scientists to ensure Ethicon’s products are free of any harmful microorganisms and to create as much runtime of the reactors as possible.

PERSONAL EXPERIENCE

In my time at Ethicon, I met numerous people who emphasized organization and instilled the concepts of cooperation. Engineering and the sciences can seldom be accomplished alone, and so, throughout the co-op I found myself communicating with a variety of people. Technicians, calibration specialists, biologists, electrical and mechanical engineers, and other co-ops were all a part of the experience. I found it most interesting to see how all these people approach their jobs and find ways to solve problems. Stay humble—everyone knows something, but no one knows everything.

How did you get your internship?

I got my co-op by attending the career fair. Show your potential employer you are motivated and involved in extracurricular activities (i.e. school organizations, part-time jobs, volunteering). Also, if you get an interview, apply as soon as you know you have one, then apply immediately. Come interview time, you’ll already be in that company’s system. It’ll tell the employer a lot about yourself.

Want to learn more? Contact:

Adam Navarro
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Expected graduation date: May 2016
PROJECT DESCRIPTION

I worked as a product technologist on the Mobil 1 product development team.

During my co-op, I worked on two projects involving engine oil development. My responsibilities included working with ExxonMobil PhD Engineers, original equipment manufacturers (OEMs), and 3rd party testing facilities.

To summarize my projects, I presented a poster to ExxonMobil Employees, as well as a 1 hour forum discussing the progress that was made during my co-op.

PERSONAL EXPERIENCE

There is so much that I learned over the course of my internship. I was able to greatly improve on my communication skills, presentation skill, and teamwork skills. I was also able to apply knowledge that I learned in the chemical engineering program at NMSU to real world problems.

I really enjoyed all of my mentors that I had during my coop at ExxonMobil. I learned early on that in order to get my projects done, I would have to find the right people to talk to. Many of these people have been working these jobs for a long time, and there is a lot that you can learn from them.

I was also very fortunate to have fellow interns and coops, which I became friends with. It was nice have people to do stuff with outside of work.

How did you get your internship?
Career fair
The two things that really helped get this internship were my resume and the relationships I built with recruiters.

Want to learn more?
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Scholarships

College is hard enough as it is, the stress of having to pay for it just makes it even harder. Apply to Scholar Dollars every year! Many engineering students receive engineering scholarships for academic achievement. So that means, keep your grades up!

Additionally, there are private scholarships to keep in mind. Many of these scholarships are prestigious, so if granted the award, your educational path will be benefited more than just financially. A list of these can be found at http://fa.nmsu.edu/scholarships/private-scholarship/
Take a look at the requirements and start filling some out!

Take advantage of your college career and become aware of all the opportunities that exist! You are your best advocate. Get involved!