



# SELF Program Pillars

**A key feature of our capstone project is the incorporation of the seven pillars of the SELF program: Managerial, engineering, entrepreneurship, leadership, business, interpersonal, and communication. These principles were exemplified throughout the duration of this experience.**

## Managerial

There is one company that defines our generation whether we believe it or not: Google. There isn't a single paper, essay, book, or homework assignment completed without the help of this wonderful company. The interesting thought is that Google has become such an integral part of our culture that we barely recognize it is there. We use it for email, images, facts, information, creating websites, but we barely realize it's our homepage every time we open the internet. So, Google must have been around for quite some time to make sure an impressive footprint in our life right? Actually, Google has only been around since the late 90's. The company just recently celebrated its 14th birthday, so what's the big secret? Management. Google boasts some of the most innovative management styles. Fortunately for us, we got to sit down with employees from their Munich branch to understand what they did that made them so successful. The first thing that jumped out at us was their idea that work was supposed to be a fun place. The office was filled with bright colors, video game stations and ping-pong tables and stresses were low. When an employee gets frustrated with work he puts it down and plays some pool. With this style of thinking more quality work was produced rather than what would have been thrown together to get it over with. The second big thing that was interesting was their "20 percent time." This was the idea that an employee was allowed to work on a project that had nothing to do with his original work one day a week. If the idea showed promise it would then be funded and additional help would be added to the project. This is how Google has created some of its greatest ideas such as Gmail, Google News, and AdSense. Google thrives off this different kind of management and we're glad we got to witness it for a short time while we enjoyed the brightly colored walls.

*-By Matthew Toft*

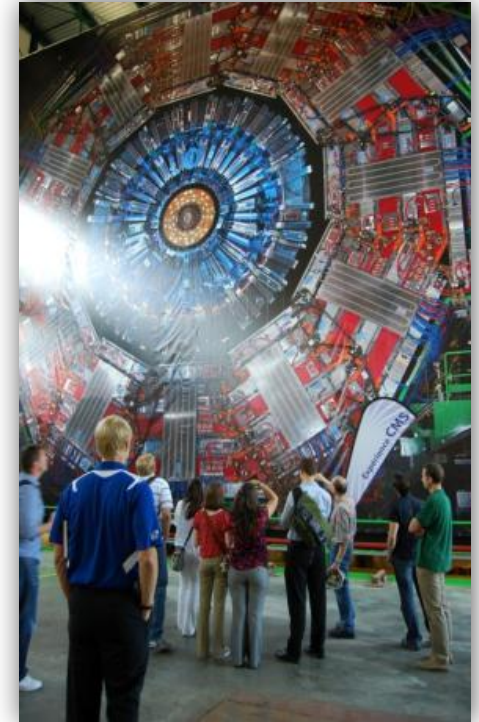


## Engineering

Engineering is the harnessing of science, research, and ingenuity to development new technologies aimed at bettering the world. If you step out for some fresh air and glance down the street, you'll likely see a handful of cars, many of them thanks to companies like BMW, Mercedes, Audi, or perhaps even Porsche! These German companies not only compete internationally, they thrive. If you happen to be in a major German city, you might notice that air is more fresh the usual – cars there are required to meet certain emission standards or be relatively new.

If you take physics or chemistry anytime soon, you might notice the presence of a new particle in the standard model – the Higgs Boson. This is one huge recent discovery out of CERN, the world's largest particle physics laboratory, based out of Geneva. This is not the first great idea to come from the wizardry taking place at CERN, nor will it be the last. Even as far back in CERN's history as 1989, they were changing the world. Sir Tim Berners Lee, an employee there at the time, is credited for the invention of the World Wide Web. Today, many of CERN's research improves widely used technologies like parallel computing and medical imaging.

*-By Chris Hudson*



## Entrepreneurship

In the simplest sense, entrepreneurship is taking a risk on an idea. Pulling off the right amount of finesse to ensure that idea becomes reality, and targeting those who would find it valuable are challenging tasks. With lots of competition, innovation in developed countries can be challenging, but Germany has definitely stepped up to meet the challenge.

In Germany, infrastructure overhauls slowly march towards more and more sustainable energy models, aiming for 80% of the country's energy needs to come from renewable sources by 2050. Heavy investment in research and development accounts for almost half a million jobs, and marks the country as a leading producer of wind turbine and solar panel technologies.

In the future, if you notice a rise in the affordability of buildings, you may have companies like Ilek to thank. Ilek, among other things, researches lightweight structures, including buildings that move in order to account for various stresses to forces like wind and snow.

No investment promises results - research consistently hits dead ends, but the rigor, determination, and devotion to science and engineering in Germany has the potential to realize goals that can change the world.

*-By Chris Hudson*



## Leadership

One of the main reasons our class chose Germany to be one of the hosts of our Capstone Project was their prominent stand as one of the world leaders in engineering and manufacturing. The easiest way to see this is through their automobiles. When you look at Porsche, Audi, Mercedes-Benz, and BMW they are known as the top of the line, quality, automobiles and this goes back to the beginning of automobile history. Karl Benz, founder of Mercedes-Benz and a German engineer, is known as the inventor of the gasoline-powered automobile in 1885. From this point on Germany has been known as an innovator in the car world. It was easy to see this as we toured the Mercedes, BMW, and Porsche museums. Every corner you turned was another monumental invention that revolutionized the industry. Ferdinand Porsche, founder of Porsche, even went so far as to create the first electric motor in 1897. It can also be seen in the world of racing. Every performance car company takes their cars to Germany to drive on the famous Nurburgring, the most demanding and difficult purpose-build racing circuits in the world. Their time on that track is how people will determine how well their car performs and it all stems from Germany.

*-By Matthew Toft*

## Business

Many of the companies we visited throughout the Alpine Projekt emphasized and shared one mindset: balancing of work and personal lives. They value their business and professional lives but never let it overshadow their hours outside of work. Traveling to Germany and Switzerland during the summer was an interesting experience; there were a lot of businesses that either had very limited hours or closed for "earned vacation time." While talking to a lot of Germans we learned that German business relations seem much more formal compared to most American businesses. Although there is always a high level of professionalism, in the United States there are not as many rigid protocols with business activities and some "small talk" is usually welcomed. German companies tend to have a strictly hierarchical approach with very specific responsibilities and expectations within the employees. Germans often criticize this approach because it tends to make individuals inflexible and unwilling to change. With Germany and Switzerland both being very internationally involved with business, all big companies and most of the smaller ones were fully capable of communicating in English, which they described as "essential" for the success of the business.

*-By Gelareh Samandi*





## Interpersonal

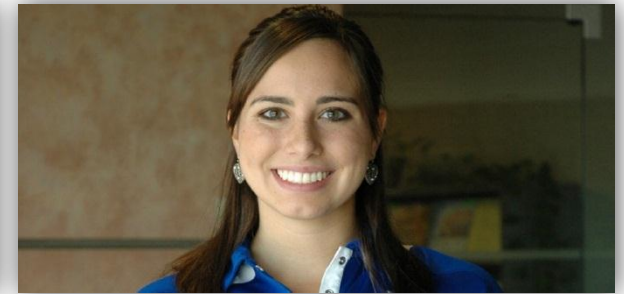
Through the long hours spent dining, the SELF fellows tested their interpersonal skills while learning more about German and Swiss culture and interacting with the natives of Western Europe. In Germany, three courses were always served with about 20 minutes in between each meal to allow for social interaction. During this time, the fellows debriefed on our experiences and the day's events or engaged in conversations with our tour guide and bus driver to gain some cultural knowledge. One significant challenge for our class was to adjust to the quiet atmosphere of restaurants. Having a group of 19 very excited travelers in the same setting and controlling the volume level proved to be harder than imagined. In the German culture, volume level is just high enough so that the person just across the table can comprehend; that certainly was not our approach. Germany is a modern and advanced society which has been shaped by a merging of lifestyles. As noticeable as the group was when walking around the cities, we used that to our advantage and met natives who happily shared their culture with us. In Genève, however, there was not a noticeable and substantial cultural difference. The tours and company visits allowed us to have direct interactions with the Swiss citizens and not only learn about their jobs, but their personal and cultural activities as well. *-By Gelareh Samandi*

## Communication

Communicating in Germany was very easy. Most Germans know English as a second language. In fact, speaking with many local Germans, they know several languages. This seems to come with the territory; Germany is within a days' train ride from over 8 countries that all speak a variety of languages. There are some regional dialects of the German language. Most of Germany speaks standard German but some older towns still speak traditional German, which is hardly understandable by someone who knows standard German. As for all of us, we could not understand any of it so it was a challenge to communicate with people who didn't speak English. The group did learn some fairly unique phrases such as "danke shoen" which is thank you very much and "kaese spaetzle" which means cheese noodles. Just like in English, there are slang phrases and short terms as well as proper and professional terms.

Switzerland is a combination of several different cultures depending on which region you are in within the country. The northern part speaks German, the southern part speaks Italian, the eastern part speaks French and the western part speaks Romansch which is a mixture of the three. This was a bit of a shock to all of us because after a week of learning basic German phrases, we now had to learn French phrases. The communication barrier that we faced was a humbling experience. *-By Ryan Poff*





# The Fellows



**Gabe  
Bliss**

**Civil Engineering  
Olathe, Kansas**

**What was your most memorable experience?**

My most memorable experience was when we were able to visit CERN. It was amazing being able to have the VIP treatment. The best part in my mind was actually seeing their server rooms and computer rooms.

**What advice would you give to future capstone experiences?**

Take time to meet with the locals and learn about what they do. They have some of the most insightful tips and information about their country. Try to talk with the tour guide and make sure that you are having meaningful conversations and don't judge the culture.

**Jamie  
Branch**

**Mechanical Engineering  
Topeka, KS**

**What was your favorite cultural experience?**

During our last night in Munich, Emma Watson and I ran through a fountain in the middle of the city-square. It was a spontaneous thing to do and in the process we made some new friends with curious spectators.

**What was your most memorable experience?**

Seeing Europe for the first time! I had never been abroad, so it was extremely exciting to look down from the plane window and see the place I had been fantasizing about seeing for years. The eight hour plane ride flew by with anticipation for that first glimpse!



**Hanna  
Cosgrove**

**Engineering Physics  
Prairie Village, Kansas**

**What was your favorite site visit?**

One of my favorite speakers was an attorney at Shook, Hardy and Bacon in Geneva. Mr. Larry Frarey stressed that you don't have to have a traditional schooling experience to be successful. He moved to Europe after high school and didn't attend law school until years later. Although I have followed a traditional route thus far, one of the only things I know about my future is that at some point I want to live and work abroad.

**What was your most memorable experience?**

One of my most memorable experiences was the Segway tour in Geneva. We get to see one of the most beautiful cities in the world and we got to do it in style. Segways may very well become my preferred mode of transportation.



**Erik  
Deddens**

**Chemical Engineering  
Prairie Village, Kansas**

**Describe the capstone in 5 colorful adjectives:**

Lavish, Exciting, Eye-Opening, Humbling, Unique

**What was your most memorable experience?**

Arriving in Geneva. The lavish lifestyle can be seen in the architecture, the expensive brand names, and luxury cars. The experience was a little bit humbling and I think I will always remember that feeling.



**Luke  
Ezell**

**Electrical Engineering  
Leavenworth, Kansas**

**What was your most memorable experience?**

When we entered Stuttgart from and the valley opened up below us. It was truly an amazing experience and cured the jet lag I was feeling from the plane ride. The vivid greens and majestic buildings were much different from what I anticipated and set the tone for the entire experience.

**What was your favorite site visit?**

The visit to Trumpf was my favorite factory visit. The automation techniques utilized there were truly astounding. Having taken control systems & studied robotics, the level of control and precision in which they operate is something that amazed me.





**Camille  
Fittell**

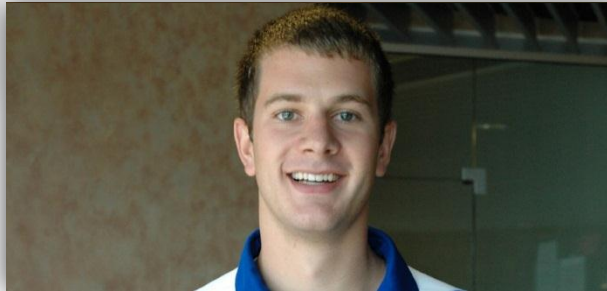
**Chemical Engineering  
Lawrence, Kansas**

**Advice for future capstone experiences?**

I am truly grateful I had the opportunity to participate not only in my own development, but in the development of future engineers. I view capstone as truly being a service to another party. Our class chose a unique way to give back to the community while still enriching our own educations by combining travel with STEM outreach. The outreach will carry the 2013 capstone experience into the future.

**What was your favorite site visit?**

ILEK - observing their structural research made me think more outside the box when it comes to architecture.



**Matthew  
Fowler**

**Civil Engineering  
Fredonia, Kansas**

**What was your most memorable experience?**

My most memorable experience occurred the day we visited CERN and the United Nations. Being meters from the Large Hadron Collider was a once-in-a-lifetime opportunity. The ground breaking research that has happened in this place is astronomical.

**What was your favorite cultural experience?**

Bavaria - the food was wonderful and the atmosphere around the common gathering ground was awesome.



**Chris  
Hudson**

**Computer Science  
Red Cloud, Nebraska**

**Advice for future capstone experiences?**

Have fun, but don't lose focus on your ultimate objective(s). Really reflect on the experience - you'll get a lot more out of it if it makes you think.

**Describe the capstone in 5 colorful adjectives:**

Innovative, techie, captivating, enthralling, beautiful

**What was your favorite cultural experience?**

I really enjoyed the Bavarian culture in Munich - the energy, the grandeur of the infrastructure, the food, and, well, everything was amazing.





## Hayden Maples

**Mechanical Engineering and Business Administration  
Olathe, Kansas**

### **What was your favorite site visit?**

I really enjoyed the TRUMPF visit for a couple reasons. Their massive machines could produce incredibly small and intricate cutouts. Also, TRUMPF integrates all different kinds of engineering to make these machines work.

### **What was your most memorable experience?**

One part of this trip I will never forget is swimming in Lake Geneva, especially jumping from a 30-40 foot platform into the lake. It was perfect weather and beautiful scenery for a swim.



## Ryan Poff

**Mechanical Engineering  
Leavenworth, Kansas**

### **Advice for future capstone experiences?**

Don't take things for granted while being there. Remember to have fun. It's an experience most of us will never get to experience again like we did. Savor every moment.

### **What was your most memorable experience?**

The most memorable experience for me was the many days/nights bonding with the rest of the class. I feel that we all grew closer together in one way or another and can see each other on a different friendship level after the trip.



## Gelareh Samandi

**Chemical Engineering/  
French Major  
Tehran, Iran**

### **What was your most memorable experience?**

My most memorable experience was the bike tour through Munich. From the English Garden to the historical streets of the city, it was an absolutely great cultural experience.

### **What was your favorite cultural experience?**

My favorite cultural experience was the bus rides in Munich with our favorite bus driver, Peter, and our fantastic tour guide, Anton. Their enthusiasm and willingness to give us a little taste of their culture as well as their great music were highlights of days in Munich.



**Austin  
Smith**

**Biomedical Engineering  
Tonganoxie, Kansas**

**What was your favorite site visit?**

Trumpf. The company showed us the entirety of their plant, products and business strategy. All equipment was precise, automated and technologically advanced. To see how a company had started and grown in Germany said a lot about the country's industry and background.

**What was your favorite cultural experience?**

The Paulaner Garten. Having a traditional Bavarian meal was a good time. We were also told about the different traditions of the area and got to look a little deeper into the German culture.



**Matthew Toft**

**Mechanical Engineering  
Overland Park, Kansas**

**What was your most memorable experience?**

Strangely the quote from Ferdinand Porsche seemed to stick with me, "I couldn't find the sports car of my dreams, so I built it myself." I think it was because the minute I got back from the trip I started working on the formula car and this kind of got me jump started.

**What was your favorite cultural experience?**

I think the Germans were the best part of the trip. It was amazing how patriotic and kind they were. It didn't matter what they were doing the instant they found out you weren't from there they had this urge to show you the best time in Germany.



**Matthew  
Vestal**

**Engineering Physics/Economics  
Lenexa, Kansas**

**What was your favorite site visit?**

Besides CERN, my favorite visit was to the University of Stuttgart. We were able to see such a variety of things and really learn about the culture of German education. Also, the work being done at ILEC was pretty amazing. I found the intelligent architecture to be fascinating.

**Advice for future capstone experiences?**

Base your experience around one concrete deliverable and everything else will fall into place. Ideally, use a location where you have a solid connection, as obtaining company visits is much tougher than expected.



**Hans  
Walther**

**Mechanical Engineering  
Olathe, Kansas**

**What was your favorite site visit?**

I think my favorite site visits were to the two universities. It was intriguing to see the types of projects that students like us are working on in Germany, and I was extremely impressed with the innovative technologies they are researching and developing.

**What was your favorite cultural experience?**

Trying to dive into the German culture was definitely a great experience. Speaking and interacting with locals was very memorable and allowed me to understand their ways more clearly. Practicing the little German I know was very fun, and eating typical regional food was incredible as well.



**Emma  
Watson**

**Chemical Engineering  
Wichita, Kansas**

**What was your favorite site visit?**

CERN. It was awesome to be in the secondary containment area for a detector that had announced the discovery of a new particle only a month before. It was also really amazing to observe how normal life is above ground while particles are being accelerated and collided more than 100 meters underground.

**Describe the experience in 5 colorful adjectives.**

Awesome, informative, exciting, once-in-a-lifetime, cultural



**Matthew  
Werner**

**Computer Engineering  
Wichita, Kansas**

**What was your most memorable experience?**

CERN was a nerd's dream come true. We saw multiple parts of their sites, saw a cutaway of one of their particle detectors, diagrams of all of the stages of particle acceleration, and were able to discuss the discovery of the Higgs-like Boson with a professional particle physicist from the most renowned research institute in the world.

**What was your favorite cultural experience?**

Our bicycle tour of Munich was amazing! We saw everything from buildings that were rebuilt after bombings in WWII to locals surfing on the river. The weather was great, and it was a beautiful way to see Munich.





# Project Mentors

## Charles Neiss

**Program Coordinator**  
**Rolla, Missouri**  
Drury University  
B.A. in English  
University of Missouri  
M.Ed. in Higher Education

### What sets the SELF Program apart?

Students have amazing opportunities to connect with industry leaders, build valuable leadership skills through hands-on project management, and create relationships with current students who will be future colleagues.

### What is your favorite thing about KU?

KU is so well-respected nationally and globally. It is exciting and encouraging to work with staff and faculty who are leaders in their fields and to interact with students who are not only very intelligent but also a lot of fun.

## Jill Hummels

**School of Engineering PR Director**  
**Lawrence, Kansas**  
Kansas State University  
B.S. in Marketing  
Kansas State University  
M.S. in Journalism and Mass Comms

### What is your favorite thing about the SELF Program?

I love being amazed by the students – their energy, their inspiration, their acumen, as well as their unabashed science and math skills. When I’m feeling world-weary, I just have to remind myself of the students and the great things they are doing here at KU and beyond and I know everything will be all right in the end.

### What motto do you live by?

“Rise and shine, you’re burning daylight.”  
There’s so much to see and do in life so get up and get going.





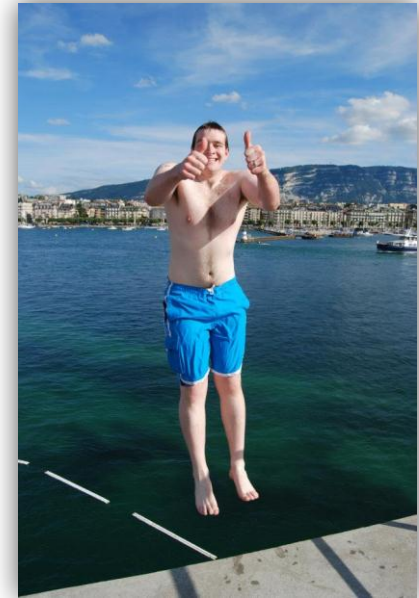
# SELF Reflections:

## How did you grow as a result of this experience?



*"I knew that I always wanted to work internationally but this trip just solidified that fact in my mind. I have high expectations for my future and hope to gain much more international experiences." –Erik Deddens*

*"My biggest personal take away from the experience is the realization that there are so many opportunities for engineers that I can find a job that I find fascinating and engaging rather than just picking a means to an end" –Hayden Maples*



*"Going international, especially since I have never done that before, made me grow as a person greatly. Being somewhere that I could not speak the language or read the signs was a unique experience that I wish everyone could get to try at least once. It made me get out of my shell and be outgoing." –Ryan Poff*



# SELF Reflections:

How did you grow as a result of this experience?



*"My personal growth was mostly cultural due to our exposure to the diversity going from Stuttgart, to Munich, and then to Genève. I believe our contact with the "everyday" natives was a big contribution to our full understanding of their cultures."- Gelareh Samandi*

*"The capstone trip really made me think about the direction in life I was heading, and what I wanted as I pursue full time career opportunities." -Jamie Branch*



*"The experience provided lots of excitement for my future in engineering, but my greatest growth occurred culturally. Becoming aware of the differences between our two cultures not only allowed me to be more sensitive to our differences, but to also have another view in solving complex social problems." -Luke Ezell*

# SELF Reflections:

## How did you grow as a result of this experience?

*"I had not considered working abroad until I experienced Geneva. My family is still a top priority in my life, but it helped me understand the balance I need to find in a career to be happy and satisfied with my choices in life." –Camille Fittell*



*"This was an eye-opener as far as foreign culture goes - I had never left the States beforehand. I had never seen that kind of rich tradition, and I didn't realize how differently-minded a culture could be from our own in terms of what they value, how they interact with other people, and just who they are. I guess it just gave me some good perspective." –Chris Hudson*



*I absorbed quite a bit about German University structure, industry attitudes, and a surprising amount about the laws and policies that may drive me to work there in the future. Everyone was extremely open to discussing whatever we wanted to talk about, and I picked up quite a bit of miscellaneous information in addition to our scheduled curriculum." – Matthew Werner*



# SELF Reflections:

How did you grow as a result of this experience?



*"It's hard to put into words how I have changed as a person. I fell in love with another culture, reinstated my career path, and made lifelong friends. I learned the difficulty of language barriers and the reward from patience. I learned to be humbled by the gifts of donors and the generosity of Simon. I've learned to adapt quickly when situations go bad and finally that Germans know how to have some fun!" –Matthew Toft*

*"Seeing new cultures and understanding the people that live and work in them developed me as a person. I feel a greater ability for empathy of people from diverse backgrounds." – Austin Smith*



*"I was able to confirm that an Undergraduate degree is not sufficient if I want to do work in other countries. It was a very rewarding experience." – Gabe Bliss*





# SELF Reflections:

How did you grow as a result of this experience?

*"Besides the obvious growth from exposure to another culture, I also got to know my fellow Fellows a lot better. I think that we grew closer as a cohort." –Emma Watson*



*"My horizon certainly expanded, meaning that I no longer want to live in the United States for my entire life. There is so much beyond our borders that most Americans are completely unaware of, and I would love the opportunity to spend more time abroad. From a technical standpoint, I learned about the differences between European and American work ethic, as well as the individual's reasons for pursuing certain degrees. Americans seem to be much more money driven, while Europeans tend to be fulfilled in other ways." –Matthew Vestal*

# SELF Reflections:

## How did you grow as a result of this experience?

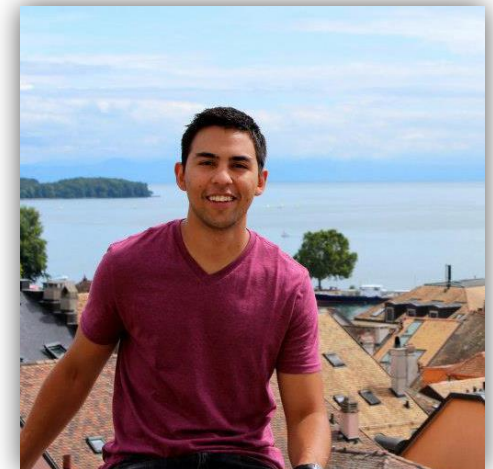


*"My most memorable experience occurred the day we visited CERN and the United Nations. Being only 8 meters from the Large Hadron Collider was a once-in-a-lifetime opportunity. The ground breaking research that has happened in this place is astronomical." –Matthew Fowler*

*"I definitely learned a lot more about German and Swiss culture, both on the professional and leisure/traditional side. Being able to connect and communicate with German and Swiss professionals has potentially opened up opportunities for the future. Throughout the organizational and preparation process, I've also learned a lot about myself and have been able to improve upon my leadership, management and communication skills." –Hans Walther*



*"The Alpine Projekt was a unique opportunity to grow friendships, meet with some of Europe's top engineering firms and develop a deep understanding for a part of the world that was completely foreign. It fueled my desire to pursue a career outside of the United States and broadened my global perspective while allowing me to pursue one of my greatest passions: seeing the world."– Hanna Cosgrove*





# Conclusion



Looking back upon all the great memories and lessons brought home from Europe, it is a distinct challenge to try and entail the vast scope of our experience in just a few words. The endeavors that we embarked on will help shape us not only as future engineers, but as individuals. Upon reflection it is best to share our adventures through the goals we went there to achieve.

## **A Different Type of Education System**

The German tradition of engineering is deeply instilled within its great tradition and history. This source of pride is shown throughout their technical institutions, two of which we were fortunate enough to visit. For many of us, it was our first introduction to the German education system and how widely it differs from the United States' version. The biggest surprise was when the professor announced that they do not typically have homework in classes and only have one exam per class. This led to great discussion on the pros and cons of this system. We were fortunate enough to meet some of the current university students, who gave us their opinions on matters ranging from their aspirations as engineers to the best places to visit later that night.





## A Rich Culture

Visiting two German cities was extremely insightful to the vast differences between regions, thus dispelling any potential generalizations. Throughout Germany there was definitely a lot of weight carried by the title of engineer, however, there were some distinct differences. In Stuttgart there seemed to be a strong emphasis on scenic beauty, with grape covered valleys, a wide green square, and perfectly accented architecture. Whereas, when we arrived in Munich, we were greeted by a tour guide wearing Lederhosen, which are traditional Bavarian leather pants. While the architecture was still gorgeous, there was more of a pride in their Bavarian culture, namely in their beer craft. This starkly contrasted with Geneva, Switzerland, which held much more emphasis on a business culture and precision engineering. We were able to experience the prevalence of French speakers in Geneva, which was a noticeable change from the German that we had just started to pick up. It was very common to hear “Danke” instead of “Merci” at the restaurants, but most people seemed comfortable with at least two languages. Every Fellow had an amazing time at every stop, embracing the differences between the societies and storing them for future memories.

## Pride in Industry

The amount of excitement exuded by all the professionals we interacted with was truly contagious. It is this excitement that helps maintain the high standard of German engineering. Every employee seemed extremely knowledgeable and their pride showed through their work as they went into every process in great detail. While this work ethic is true here in the United States, it was refreshing to see the enthusiasm in one’s work, even given the European Nation’s current state.

There really are no words that can describe the adventure we undertook this summer, nor are there words to express our sincere gratitude towards the people that made it possible. All that can be said is a heartfelt thank you and it becomes our turn to invest in the future of engineering.

Auf Wiedersehen/Adieu

SELF Fellows Class of 2013



Thank You!



The 2013 class of the University of Kansas School of Engineering Self Engineering Leadership Fellows would like thank our donors for all the services and contributions they made to help make this experience a reality.

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Without their contributions, this experience would not have happened. We appreciate the time they took to listen to our proposal and assist in our education.

We would also like to especially thank **Al & Lila Self**. Without your vision and selfless contribution to the KU School of Engineering, none of this would have been reality. All of us appreciate the gift you have given us and are forever grateful to you.

This portfolio was assembled and designed by: Jamie Branch & Luke Ezell



