SPRING 2017 NEWSLETTER

Compiled and edited by Robyn A. Varner, '17

Class of 2016 pays it forward.

The Class of 2016 is one that has been missed for sure. They have been missed, in part, due to their innovative projects. As many of you may know, the Department of Chemical Engineering here at Tech has a few notoriously project-heavy, senior level classes, of which the Capstone Design course is one. Last year, I had the privilege of getting to see the many exciting projects produced by the Class of 2016 in this course. Their capstone and senior design projects were very memorable, featuring everything from distillation and absorption to water filtration and beer brewing. Unfortunately, time and space allow for us to feature only a few of these project descriptions.

Capstone Design is a class presently taught by Mr. Guy Materi, adjunct professor in the Department of Chemical Engineering. The class is offered the second semester of the senior year. Its primary purpose is to have the student teams use their engineering and problem solving skills to create either a lab or teaching aid for future chemical engineering students, or to create a tool to help solve a current problem. The teams must then present their projects to the junior Thermodynamics and Fluid Mechanics labs.

The first project we want to feature is a design of a lab that allows students taking Mass Transfer to gather experimental data to compare with absorption theory and to calculate the mass transfer coefficient.

It also allows students to become more familiar with design and modeling software, such as Aspen Plus®.

Group members Braedon Hilliard, Logan Boles, Kevin Mann, Abdullah Alzeer and Muhammad Almasilit put a great deal of effort into insuring that the lab would not only be educational, but also time-sensitive.

The presentation was well executed. Almasilit explained the scope of the experiment. Boles shared in the class the importance of safety in the lab, and how they went about ensuring they had a safe environment. Mann shared a small and very helpful lesson on what mass transfer is, for those of us who have yet to experience the class. He also shared with great detail how they executed the lab and the theory behind it. Alzeer and Hilliard did a fantastic job showing how to operate the absorption column located in the Unit Operations Lab and answering questions regarding its functionality.

Overall, it seems this team gained a deeper understanding of the theory behind absorption. As an audience member, I can say that I learned a lot, too.

Abdullah stated that learning to use Gnatt charts and taking meeting minutes were some of the useful tools he has been able to utilize from this project. When asked what the most exciting part of the project was, the team's response was "finishing." I'm sure this was true for many teams and many past students.

Capstone projects are often sponsored by industry. If your company has any projects or ideas, please send suggestions to Becky Asher. rasher@tntech.edu.

Chemistry Humor

1. What do you call a tooth in a glass of water?
2. What did one charged atom say to the other?
3. What should you do with a dead chemist?
4. What is the name of agent 007's Eskimo cousin?
5. What did the chemist say when he found two isotopes of helium?
6. What show do cesium and iodine love to watch together?
7. What was Avogadro's favorite sport?
8. What happened to the man stopped for having sodium chloride and a 9-volt in his car?

Stretz expands 3-D research at Tech.

Holly Stretz has been a professor of chemical engineering and conducting research at Tennessee Tech for 11 years. During her time at Tech she has focused much of her research on the study of polymers. In the fall 2015 semester, she took a sabbatical to collaborate with a team at Oak Ridge National Laboratory (ORNL), conducting research with Local Motors and BASF. Recently, I had the privilege to speak with Stretz regarding her time with this amazing team.

According to Stretz, what initially sparked her interest in 3-D printing applications was that incredible things, such as cars, human organs and tissues, as well as prosthetics and other devices for medical applications, can be 3-D printed. Stretz was surprised by the fact that until now there have not been very many materials specialists involved in research in the 3-D printing field.

As a result of this time spent with ORNL, Stretz hopes to help build a team at Tech to aid in the materials aspect of these exciting innovations.

She believes that the 3-D printing industry has not yet tapped into the full potential of the field, because only a few materials have been used. "Due to the ease of customization of material properties this direction may become very important for the field," said Stretz.

Overall, she says of her sabbatical, "the idea was to bring back to Tech connections with other universities, national labs, and (companies) like Local Motors and BASF."

It appears she has been successful in accomplishing this.

Julian Lyons '11 ChE Interview

Recently, Julian Lyons, '11 ChE spoke to an Introduction to Chemical Engineering freshman class. Lyons works for Dow Chemical Company in Knoxville as a senior run plant engineer, in Coating Materials. In that position, he serves as a technical resource in the manufacture of specialty coatings for various applications. Lyons also scales new products to the plant level, and manages small capital projects. According to Lyons, the main focuses of his job are safety, production and quality.

When he's not at work, Lyons says he enjoys a variety of outdoor activities, including hiking, camping, mountain biking, paddling and spending quality time with his wife, family, friends and two dogs. Lyons met his wife, Erin, on the first floor of Tech's Roaden University Center.

(cont'd, from Lyons interview)

When asked about his favorite memory he said, "…undoubtedly meeting my wife in what used to be Seattle's Best Coffee shop. I didn't drink coffee at the time, but she caught my eye, so I hopped in line and ordered a Gatorade to get a chance to introduce myself. I walked her to class, and the rest is history. She is the love of my life and I couldn't imagine where I'd be without her. I'll never forget that moment."

As a Phi Gamma Delta brother, he recalls the old South Patio as a favorite spot to gather on campus. He also considers Sherlock Park, where he played many games of Ultimate Frisbee with friends after church on Sundays, to be another memorable spot on campus. Cummins Falls was another one of his favorite places to visit while a student at Tech.

Lyons reflected that Tech's library is "very different from when he last saw it." It has undergone several major changes. When Lyons was at Tech, the first floor was full of books and the third floor had no "creative spaces." All of the books are now located on the third floor, which also houses many tables and cubicles for quiet study. In the northeast corner of the third floor, is a new creative space. Included in this space is the iMakerSpace, which is home to 3-D printers, an embroider machine, machine tools and other equipment for students to use for projects and club events.

When asked about ways Tech could improve, Lyons stated, "I'd like to see more curriculum and labs focused on process instrumentation, like temperature, flow, and pressure transmitters and equipment, such as pumps, piping, valves, heat exchangers, vessel ratings, relief devices, etc. The biggest learning curve for me as an engineer in a chemical plant was learning how instrumentation works in a control system and how pumps and other chemical handling equipment operate."

However, he did take some valuable information from Tennessee Tech that has helped in his success.

"Foundational skills in problem solving is by far the most valuable skill I learned," Lyons said. "Understanding how to identify and define a problem is the first step in finding a solution, and Tech helped me to develop that skill. From an information and curriculum standpoint; a knowledge base of thermodynamics, transfer sciences, kinetics, chemistry, math, etc., are essential to the life of a chemical engineer."

The Department of Chemical Engineering at Tennessee Tech certainly provided me with the tools I needed to be successful in a multitude of professional disciplines.

Information Request

Laura Arias-Chavez has been teaching the Introduction to Chemical and Biological Process Analysis and Scaling classes for the past four years. Chavez has a strong desire to help students make connections with real-world problems. If you have any data sets, or interesting problem statements she could use as examples and homework problems, please send them to her at lchavez@tntech.edu

Answers To Jokes

1. A one molar solution
2. I've got my ion you
3. Barium!
4. Polar Bond
5. HeHe
6. CsI
7. Golf, because he always got a "mole in one"
8. He was booked for a salt and battery

Equipment donations help students gain skills

As always, all donations to the department are greatly appreciated. Currently, there is a need for more equipment to enable students to gain knowledge of and skill in the use of equipment they will likely be required to operate on the job. Guy Materi, an adjunct professor in the Department of Chemical Engineering and a retired chemical engineer at Tech, spent many years in industry. He has said that he would like to do more hands-on labs, but the funds and equipment are not available. Also, some of the department's equipment is unusable and the department does not have the funds to purchase parts for repairs.

Some examples of equipment the department could use are: a gas chromatography mass spectrometer; reverse osmosis kits; Peltier heaters/coolers; National Instrument data modules; and micro distillation systems. Equipment donations may be tax deductible. Verify with your tax adviser for more information. To find out more about what equipment is needed, scan the QR code below, or visit our website at tntech.edu/engineering/che. Monetary gifts are also always appreciated.

How to donate

Equipment

Contact Becky Asher at rasher@tntech.edu or by phone at 931-372-3297.

Monetary Gifts Online by Credit Card

Go to tntech.edu/univadv/annualgiving/giving-options/online-giving.

1. Select your gift amount.
2. Choose "College of Engineering" from the drop-down box.
3. Type "Department of Chemical Engineering" in the "Comment" box.

Monetary Gifts by Check

Make payable to "TTU Foundation."
Memo: "Department of Chemical Engineering."
Mail to: TTU Foundation, Campus Box 1915, Cookeville, TN 38505

(Answers from first edition)

A	R	C	E	■	A	L	T	O	■	D	E	C	A	Y
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