

# INTERDISCIPLINARY BUSINESS AND ENGINEERING (IBE)

## Interdisciplinary Business and Engineering: An Update

We are often asked where IBE majors work. The word cloud below are just some of the firms who have employed our grads. We will provide a word cloud of the types of positions in which alums are employed in the next issue.

In this issue of the newsletter, you will find a faculty spotlight on Dr. Greg Dillon, associate director for research and technology and associate professor of engineering, who teaches the capstone with Dr. Diane Parente, Samuel A. and Elizabeth B. Breene professor of management and program chair for IBE. We think you will enjoy learning about our Irish faculty member in IBE. Mitch Buchna is a junior IBE major who has wrote about internships and Christian Schiffer is a senior who has accepted a job as field supervisor for National Fuel Gas. A team of IBE students participated in the NOBE Conference in State College. Please note that we have officers in the national NOBE.

Alayna Steel is our alumni spotlight. She landed one of two jobs at Freudenberg Medical in California in a rotational program. The competition was strong and we are thrilled to have Alayna represent IBE and Behrend. Finally, given that we will have two sections of the capstone, forty-three students and approximately fourteen teams, it seemed appropriate to write about some of the projects available in the senior class this year.

Happy reading!



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### Message from the IBE Department Chair Dr. Diane Parente

The IBE major is growing and growing. We had thirty sophomores applying for entrance to major. There are another ten or more who have made inquiries and will take classes in the fall to qualify for ETM. Additionally, there are thirty freshmen who will be joining Behrend next year intending to major in IBE. Finally, we will have two sections of the Capstone in the fall and approximately forty-three seniors who will graduate in either May or December 2016. More on the capstone later in the newsletter!



### THE IBE CAPSTONE

The capstone experience in IBE is a two-semester senior project. Each team of three (or four) works with a company to take a product or process and bring it to market within the existing corporate structure. The principle is called “corporate entrepreneurship” or “intrapreneurship.” The projects take advantage of existing corporations in the Erie area and help them to reinvigorate their business.

The projects must have both a business and a technical challenge. Both student teams and the firms bid to make the alliance. The projects culminate with the Fasnmyer Conference in the spring. Student teams also participate in the poster competition. You can see several IBE project posters on the second floor of Burke.

We have also included an article describing the Smart Fork Lift Assist Project written by the sponsor, Ed Crow.

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### **ARL - Technology Assist to Engage Fork Truck with Cargo Loads in Unimproved Terrain**

#### ***The Challenge***

- Provide a low cost, technology assist for a single operator to efficiently engage palletized and ISO container loads in unimproved terrain.

#### ***Your Mission, should you choose to accept it.....***

- 1). Conduct an assessment of commercial practice
- 2). Identify the problems encountered in military practice
- 3). Identify a range of technology solutions from driver assists to an autonomy manipulator package
- 4). Design and conduct an experiment of a typical cargo handling problem in combat environment
- 5). Conduct a business case analysis of both manpower reduction and increased ability to move goods.
- 6). Estimate the developmental and production costs of the device.
- 7). Extrapolate the impact, cost, benefits and ROI for private, commercial and military trucks

One capstone project is with the Applied Research Lab in conjunction with the Department of the Army.

See the article from Ed Crow, project sponsor, on page 4.

## THE IBE CAPSTONE CONTINUED

### **FMC Technologies** – Velocity of Sound Meter

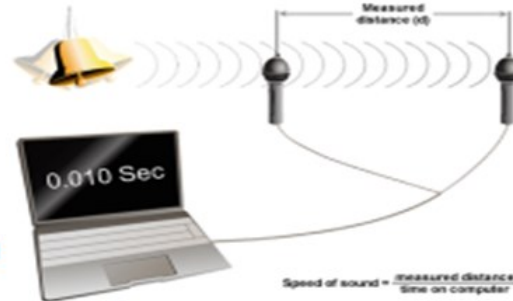
#### *The Challenge*

- Assess the feasibility and market benefit of developing an instrument that can determine the Velocity of Sound in a petroleum pipeline. This could be a much larger market with the additional viscosity, density and batch interface calculation capabilities.
- Determine the market need for an instrument that could perform this function and if viable, assess challenges associated with development and implementation

#### *Your Mission, should you choose to accept it.....*

In order to develop new market opportunities we need to understand which features are possible and at what cost.

- Velocity of sound detection.
- Viscosity estimation. Using attenuation model that could be adapted to meter
- Density estimation
- Integrated temperature, pressure and VOS for fluid characterization, batch interface detection tool.



This project is one that could increase business opportunities for FMC Technologies.

### **H. F. Graygo Engineering**

#### *The Challenge*

- People recovering from hip, knee and back surgery are required to wear a tennis shoe to physical therapy.
- These people all have the same shortcoming. They cannot bend over to tie the shoe. Even though there are velcro type shoes on the market, the individual is still not able to bend over to perform the tightening.



#### *Your Mission, should you choose to accept it.....*

Graygo Engineering challenges the team to complete a design and technical feasibility study and on the basis of evolved designs determine the market size and associated value.

This project will be presented to the Behrend Council of Fellows in April 2016. Students have developed a prototype using 3D Printing. It is now “patent pending.”



## IBE SENIORS WORK ON SMART FORK LIFT ASSIST PROJECT

Interdisciplinary Business with Engineering Studies seniors, Andy McCracken, Lauren Rosato, and Nick Stewart are tackling the issues military fork truck drivers face in the battlefield to move goods and equipment. Unlike factories and warehouses with flat and paved floors, material handling equipment operators need to move pallets and loads in varying sizes and shapes on uneven, soft, and sloppy ground... and they need to move them fast. Today, a forklift operator and “spotter” work together to approach the pallet, align with its lift points, and move it out.

The Smart Fork Lift Assist project goals were provided by government engineers in charge of current forklift equipment. The IBE team conducted interviews to better understand two primary goals: decrease the time to engage the load, and do so with only one person, not two.

McCracken, Rosato, and Stewart approached the problem head on with a field trip to the National Guard Armory in Clearfield, Pennsylvania. There they were able to meet with U.S. Army operators to understand the full range and scope of the challenge. Further they were able to operate 5 ton and 10 ton forklifts where they experienced both the capability of the equipment and the difficulties of maneuvering. Blind spots were prevalent in almost all directions from the operator seat. They noted that the spotter was really the person in control of the machine telling the operator where to position the machine.

Based upon the results of this field trip and further study, the senior IBE team conducted an analysis of alternatives that considered operational, environmental, and reliability factors. Their analysis yielded two approaches: provide sensors to improve the situational awareness of the driver (e.g. cameras) or provide teleoperation of the vehicle to the spotter (remote control).

Currently, the team is building a prototype and will test it on the equipment during a second field trip to the National Guard Armory in April. Their results will be presented at the Fasenmyer Engineering Conference in the IBE presentations.

Ed Crow, project sponsor from Penn State Applied Research Laboratory, says that there are many problems the military faces that could be addressed by business and engineering teams such as those at Behrend. Not only can these problems be addressed with

new and innovative ideas with this approach, but also the seniors then graduate with practical and hands-on experience that makes them very attractive as “graduates ready for tasking.”



### SADNESS TO REPORT...



It is with much sorrow that we report that we have lost one of our finest IBE alumnus.

Kyle Liebold was a 2014 graduate of the IBE program. He lost his life in a tragic accident on his job on February 20. He was on a rotational leadership program with Norfolk South-ern.

Kyle was a great advocate of the program and continued to offer support and notify current students of jobs. Kyle used his spare time at Behrend to volunteer at the Brookside Fire Company and the Perry Hi-Way Hose Company. He was actually one of the first firefighters on the scene at the “big fire” on campus when Dobbins burned. Kyle also attained certification as an EMT. As Dr. Greg Dillon said, “You could do a lot worse than to emulate Kyle.”

Kyle always had a big smile for everyone and was one of those students that we will always remember. A number of the alums are interested in starting a scholarship in Kyle’s memory. We are working with the college’s Development department and Kyle’s family to make that happen.

Peace to a fine young man who touched all he knew and didn’t have the time to touch more.

### CHRISTIAN SCHIFFER

*Senior Spotlight*



#### How did you begin your job search?

I began going to the career fairs on campus in my sophomore year. I made several contacts at companies that I was interested in. This fall I began to take a look at companies that I would like to work for. I scanned their websites for job openings. National Fuel Gas was a company that I had made a contact with at the career fair and one that I was interested in starting my career with. A position was available and

it was exactly what I was looking for.

#### What is your future position?

I will be a Field Operations Supervisor for National Fuel Gas. I’ll be located out of the Oil City Service Center. Essentially, the position is a construction foreman job. I’ll be using several skills that I learned from the IBE program and family business.

#### How do you think IBE has helped you to get the job?

The position required an engineering background due to the technical aspects of the job. The job requirements also included project management skills. IBE allowed me to have ample knowledge in both of these areas. My module focus was Project and Supply Chain Management and I ended up making it a second major. The IBE program helped prepare me for the position.

#### What is your advice for current students looking for an internship or full time position?

If you are searching for any type of position while in school, take advantage of the career fairs and opportunities to meet with other companies that come to campus. Do not be afraid to approach them, even if they may not be “interested” in IBE students. Be good at marketing yourself and show potential employers how you can be an asset to their company.

**“If you are searching for any type of position while in school, take advantage of the career fairs and opportunities to meet with other companies that come to campus.”**

### ALAYNA STEELE '15

*Alumni Spotlight*



**Tell us a bit about your personal background. Where are you from? What did you think you would major in when you arrived at Behrend?**

I am from Washington, Pennsylvania. I always wanted to become an engineer. My original plan was to major in civil engineering and transfer to University Park.

**How did you end up in IBE?**

I started out in civil engineering and quickly switched to mechanical. After two years, as a Mechanical Engineering major, I made the decision to switch to IBE because I saw the value in having multiple disciplinary skill sets. I also recognized that if I wanted to work into a leadership role, business experience would be required.

**Which module(s), minors, or double majors do you have?**

My modules were Operations and Supply Chain Management and Technical Sales. I also earned a certificate in Systems, Applications, and Products (SAP).

**What advice do you have for current students?**

I would tell younger students to be involved not only in the major but in organizations on campus, specifically the National Organization for Business and Engineering (NOBE) as the chapter's goal is to provide members with the ability to understand and learn to communicate between the business and engineering worlds.

Also, taking on multiple diverse internships that showcase your technical and business strengths will help potential employers understand your skill set and what you can offer as a potential employee.

**What was your best experience in IBE?**

The best experience I had with IBE would be the community within the major. The smaller class size gave us the opportunity to work together inside and outside the classroom. If anyone needed any help, whether a professor or classmate, someone was always willing to help.

Another thing that I liked, was being able to choose a module. This gave me the opportunity to concentrate on a specific set of skills that would be directly used in the workplace.

**Where are you working? What is your job title? Why do you think they hired you?**

I am working at Freudenberg Medical, a global medical contract manufacturing leader specializing in silicone and thermoplastic component and finished devices. My job title is engineer 1 and I am working in a rotational program called the Freudenberg Medical Academy. This rotational program is designed to achieve understanding of all functional departments at the Freudenberg Medical organization and enhance career development. I am current-

ly located in Santa Barbara, California and will move to work in Louisville, Kentucky, Indianapolis, Indiana, and Kaiserslautern, Germany. I will complete the program in February 2017.

Freudenberg Medical hired me because of my open mind set on being involved in multiple functional areas and relocation. They also hired me because I am coachable and hold myself accountable for my actions. While moving to different areas, I'm enthusiastic about the feedback and am passionate about my role. Being coached and learning from my mentors is one of my favorite parts about of job.

**What is the major skill you bring from your IBE major to your job?**

One major technical skill set has been my experience with SAP. My first site in Los Angeles launched SAP a month into my stay. I was given the opportunity to lead the training for the engineering department on creating BOMs, recipes, and purchase requisitions. I also aided in the implementation strategy and data verification process.

**"Taking on multiple diverse internships that showcase your technical and business strengths will help potential employers understand your skill set and what you can offer as a potential employee."**



## ALUMNI AND FRIENDS

### MITCH BUCHNA

*Internship Spotlight*



#### What advice do you have for IBE students looking for internships?

Don't believe the whole "first-year students can't get internships" myth. Go to the career fair, be well prepared and have a great résumé. Have a lot of confidence in your abilities, dress to the code, and show the companies that you are ready and determined to get an internship. Work with ACPC and get the help building a résumé and practice interviewing with them. If you do your research and work hard, you will get an internship whether you're a first-year student, sophomore, junior or senior.

Companies want a striving, determined, hardworking individuals that want to work and learn.

#### Where did you begin your internship search?

When I was a first-year student, I wanted to be that guy that proved the "first-year students can't get internships" statement false. I spoke with Dr. Diane Parente and she gave me the guidance and tools to begin my internship search. I went to ACPC and spent time working on my résumé with them and learning how to interview and be prepared to go into the career fair. I went to the career fair in the spring of my first year and walked out of there with two companies wanting to interview with me. I was on top of the world.

#### Where have you had internships?

I landed my first internship as a freshman at FMC Technologies located in Erie. While at FMC, I was a production support intern and learned what it was like to have my first internship and what it entailed. After FMC, I moved on to a company called Swagelok also located in Erie as well. While at Swagelok, I was an engineering intern within their Valves and Services Group. While at Swagelok, I really challenged myself and improved upon myself and my abilities. For the summer of 2016, I will be working at GE Transportation in Erie where I will be a Project and Supply Chain Intern and will

continue growing and learning.

#### What is your ideal future career?

I would love to work for a company that pushes me and my abilities and helps me grow and learn within whatever role I take on. It would be a dream come true to work for a company like Orvis, Mathews Bows, Cabela's, or even John Deere because I'm very passionate about the outdoors. It's hard to really say what my "ideal future career" would be simply because I love experiencing new things. I almost don't want to have an ideal career planned because something great might come along in my life that I would fall in love doing that I wouldn't have exactly planned out.

#### How do you think the IBE degree major helped you stand out?

The IBE degree helped me stand out because the degree is a perfect blend of two great fields. IBE helps link two different mindsets together to really have a great understanding of business and manufacturing. The degree is rapidly growing and companies love us. Every year at the career fair, I see more and more companies searching for IBE students as well as seeing more and more students going after the IBE degree. IBE also has a lot of options and I don't feel tied down to one field or limited to one career.

## FACULTY SPOTLIGHT

### GREG DILLION

*Associate director for research and technology transfer and associate professor of mechanical engineering*



#### What is your degree in and from where?

I have baccalaureate and doctoral degrees from the University of Limerick in Ireland. Both degrees were in materials engineering. For my doctoral research I studied failure mechanisms in advanced composite materials

#### What did you do prior to coming to Behrend?

Immediately before joining Behrend, I was deputy director of the Composite Materials Division at Penn State's Applied Research Laboratory in University Park. Prior to that, I was principal engineer in Advanced Development with Northrop Grumman.

I also worked for Lawrie Technology in Girard, Pennsylvania as a senior development engineer. My first job in the United States was as assistant director of the Composite Manufacturing Program at the Massachusetts Institute of Technology.

#### How did you first get involved with IBE?

Dr. Parente got me involved, almost during the interview process! We've been more or less joined at the hip ever since. Dr. Parente has been the chair and champion of the IBE program right from its beginnings and she is tireless in seeking ways to enrich the major and the student experience. She seemed to recognize very quickly that my experience

## FACULTY SPOTLIGHT

in manufacturing and product/process development was a good fit for the capstone course and I got involved very quickly.

### Why is IBE a good major?

I feel very strongly that industry has an increasing need for graduates that can speak both the language of science and engineering as well as the language of business. In my experience, engineers tend to know little or nothing about the business functions of an organization and business graduates are often very uncomfortable in the technical realm. The breadth of grounding in both disciplines is so solid in IBE that our graduates are rare and valuable assets that can thrive in both fields. IBE is primarily intended to prepare students to contribute in business functions of technology companies. Being equally comfortable discussing supply chain and product design, for instance, is quite a discriminator. And the word is out. The demand for our graduates is increasing and the offer packages are getting more and more attractive. Consequently IBE is the fastest growing major at Behrend. I'm immensely proud of what our graduates

are achieving and as we continue to evolve the program the future looks extremely bright. Gotta wear shades!

### How do you feel the capstone class prepares students for future careers?

I believe that the IBE senior design class is a tremendous experience and one that demands maturity, inventiveness, thoroughness, energy and determination from the student. The most important thing is that our industry collaborators have the student teams working on real problems that could have a great impact on their businesses. For many students, this will be the first time in their careers when they are asked to work on a problem for which the solution is not obvious. In fact, a major part of the assignment is to actually define the problem or challenge. Often the *customer* doesn't even know exactly what they need. This is precisely the way industry works. In my three decades as an engineer, I've never once had a boss come to me with a problem *and* a solution. The spectrum of assignments is nothing short of spectacular and our students come through time and time

again! This year alone we have projects focused on providing logistical solutions for the U.S. Army, developing products to aid convalescents, evaluating radical new construction materials, evolving oil-spill cleanup technology, commercializing anti-microbial products and many others that are equally challenging and exciting. If there is a way to make the experience more representative of what lies ahead I'm not aware of it.

In addition to working on their own challenges, student teams provide frequent briefings to faculty, industry collaborators and classmates. Thus they are exposed to an amazing array of initiatives. Again, this is representative of the professional world. And, of course, team based projects allow students the opportunity to learn how to collaborate and hold each other accountable. We very much like to challenge the student teams to take ownership of their projects and think of themselves as part of the product or process development enterprise of their sponsors companies. It really is more than just a dress rehearsal for what awaits.

## STUDENT ENGAGEMENT

### OVER THE SUMMER, THINK ABOUT WHAT YOU WILL BE DOING NEXT SUMMER OR SEMSTER. WHERE DO YOU WANT TO GO?

In the Black School of Business, we want to prepare our students to thrive in the global business environment, whether it is working for an international company or in a multi-cultural setting.

Cultural agility is ranked as a top ten skill required by managers in all areas of business.

There is no better way to gain this experience than to take advantage of the **Study Abroad** opportunities available at **Penn State Behrend**.

Programs range from ten days to a whole year. Foreign language is not required.

**What are you waiting for? Start exploring now. It takes time to plan.**

Visit <http://psbehrend.psu.edu/Academics/academic-programs/study-abroad-1> and attend one of the Learning Resource Center's Study Abroad Information Sessions.

### Why Study Abroad?

- Prepare yourself for the Global Business Environment
- Expand your academic background
- Accelerate your personal growth
- Increase your career opportunities



## STUDENT ENGAGEMENT

### NATIONAL ORGANIZATION FOR BUSINESS AND ENGINEERING (NOBE) UPDATE

The annual NOBE, National Organization for Business and Engineering, conference happened in February this year at Penn State University Park. Penn State Behrend was fortunate enough to send five NOBE members to the event along with a Behrend alumna. There were also other colleges there including McGill University, the University of Minnesota, and Drexel University. University Park put on a very informative and successful event with the help of Dr. Paul Lynch, an industrial engineering professor at Penn State Behrend. The event began on Friday and went until Sunday with events from speakers to a case competition. The case competition gave members a good experience about the process of dealing with real problems while being under a time constraint. There was also the yearly chapter updates along with elections of the National Executive Board for next year. Overall, this was a great experience that gave students a chance to network, learn new information, and find ways to improve their NOBE chapter along with Penn State Behrend as a whole.



### GET INVOLVED

**Students:** Attending just one (or ten) club event(s) per semester can change your course and perceptions for a lifetime. Previous event attendees have used the knowledge they gained from one conversation to earn their first interview, get their first job, change their concept of a specific job, or open their eyes to a world of possibilities. Take a deep breath, and walk through the door. You are welcome here.

**Alumni and Friends:** Your time, experiences, insights, and perspectives are valuable—perhaps more valuable than you know. We want to know what impacted your career, your perspectives, and your life. Tell us through the Black School of Business Facebook page, the newly-created (and growing) Black School of Business LinkedIn group, or by emailing Ariana Gloeckner, newsletter coordinator, at [azg5486@psu.edu](mailto:azg5486@psu.edu)

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